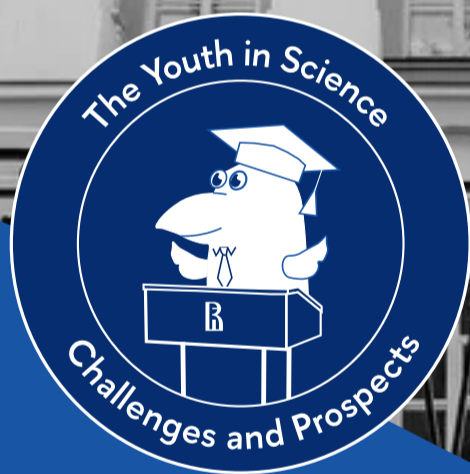


HSE University
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The Youth in Science: Challenges and Prospects

Proceedings of the 4th scientific student conference

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How Distorted Perception Distorts Economics
Как искаженное восприятие искажает экономику

ABSTRACT.

Social sciences acknowledge individuals' biased information perception, contrasting with economics, where models often overlook the intricate nature of individual conceptualization. Notably, prevailing economic models, while highly formalized, fall short in accommodating the nuanced and distorted behavior of individuals. This disparity becomes more pronounced when examining the mathematical aspects of economic processes, creating a significant gap between the real state of the world and the theoretically ideal studied world. This widening gap poses the inherent risk of drawing incorrect practical conclusions.

This paper seeks to undertake an in-depth exploration into the profound influence of distorted public opinion on the well-being of individuals and society as a whole. A meticulous review is conducted, focusing on the sources of biased information and delving into the varying levels of people's awareness of the actual state of affairs. Such awareness levels are shown to exert substantial impacts on individuals' health, employment, and political conditions. To enrich this exploration, mathematical formulas are deployed and substantiated through an extensive analysis of people's behavior, leveraging insights gleaned from a comprehensive review of polls and survey results on this topic. Through this interdisciplinary approach, the study aims to bridge the gap between theory and reality, contributing to a more nuanced understanding of the intricate interplay between biased perceptions, economic models, and societal dynamics.

Keywords: *economic illusion, cognitive dissonance, public welfare, distorted perception*

Introduction

Classical economic models traditionally depict individuals as economic agents equipped with rational or adaptive expectations that are reasonably purposeful regarding ongoing events. However, this theoretical assumption does not align with the complexities of the real world and the insights from fields such as culture, psychology, and sociology, which have long recognized the potential for agents to misinterpret information. The issue of cognitive distortions in perceived information has become increasingly pertinent due to

the proliferation of unreliable sources. The global accessibility of the Internet has significantly amplified the risks associated with the dissemination of false and unverified information. This misinformation often appears optimal and accurate to agents, as the costs of verifying information or the costs associated with holding accurate information are prohibitively high. Consequently, in their pursuit of individual well-being, people may unconsciously distort external facts, leading to deteriorated individual living conditions and suboptimal societal decisions, ultimately diminishing public welfare at both group and national levels.

This paper presents a comprehensive literature review of several economic articles wherein the authors have endeavored to integrate agents' illusory perceptions into existing models. These studies aim to empirically and theoretically elucidate the ramifications for individuals and society. The authors' conclusions will be systematically compared. Based on the reviewed literature, a pertinent research question within the theme of economic illusions will be formulated, followed by the proposal of primary research methods to explore this question.

In this paper an attempt to compare existing mathematical models and prerequisites for the influence of distorted perception on people and empirical data in the field of religion, where faith can create some illusions, and politics, namely the existence of the problem of low participation in voting will be made. The second section will present a comprehensive literature review of several economic articles where the authors have endeavored to integrate agents' illusory perceptions into existing models. Then, in Section three, this paper observes the key empirical results of several poll reviews. Finally, Section four concludes.

Literature review

For a long time, economic science did not consider the possibility that economic agents could make irrational decisions based on available information. However, in the late 20th century, George Akerlof initiated research on the impact of information distortions by individuals on the economy and demonstrated how human prejudices and cognitive distortions could significantly affect market functioning. The scientist wrote three articles that examine the problem of economic illusions in different ways. The first article, (Akerlof, 1970), considers the reduction of social welfare as a result of market mechanisms being suboptimal under conditions of asymmetric information. Using the example of the car market, where bad cars are sold at inflated prices, thus replacing good and quality cars, the author shows the risks of reducing the diversity of quality products in markets, and also emphasizes the corresponding importance of guarantees and brand names, which can create a situation of more symmetric – that is, complete and equivalent information – for buyers and sellers. These conclusions extend to models of medical insurance and employment among minorities, as the behavior of dishonest individuals reduces the level of trust towards others in the markets.

However, there are other forms of irrational behavior where agents prefer distorted perception having access to truthful and complete information, because the utility of self-deception is higher. For instance, employees in hazardous industries may not purchase protective equipment because their belief in safety of their job, acquired during last periods, when equipment was unavailable, does not change (Akerlof, Dickens, 1982). Another example is the situation, in which people may fish out of a lake without considering the consequences for others and that the lake may become depleted (Akerlof, 1989). Even though people can learn the necessary and truthful information, they prefer to live in their illusions and not delve into the details, which leads to a reduction in social welfare, as in the first case, the cost of the product will increase due to high risks of accidents, and in the second, the lake will be depleted because the fish reproduction function is less than people assume. An illustration of the situation in a hazardous industry is described in Figure 1.

However, the authors propose solving these problems through the introduction of government intervention in market functioning. Thus, the introduction of safety legislation, insurance, and fines for the actions of agents can improve social welfare. Moreover, economically incorrect illusory behavior is introduced in examples of uninformative advertising, which satisfies people's need to see themselves as smart, attractive, and socially significant. As in the case of market asymmetry, distorted perception of the real situation (and the actual state of products) leads to irrational behavior, and some genuinely quality products remain in the shadows due to insufficient flattery to consumers.

In addition to considering everyday problems, Akerlof also turns to issues of non-participation in the political life of the country and political illiteracy of the population. Using the model of war (experts) and the victim (peaceful population), the author shows that during elections, if trust in the current government is higher, society "becomes a victim of experts" and does not achieve maximum welfare, as experts choose the most priority distribution for themselves. This means that due to agents' desire to feel good and not delve into the work of experts, private and public gains decrease. However, this situation also extends to a real model when people consider their vote too insignificant and prefer not to participate in elections, which, when extended to a larger number of people, has significant negative consequences for society (Caplan, 2001).

Distorted perception of agents can also be introduced into models through rational ignorance and rational irrationality (Caplan, 2001). Consider a model in which there is a cost of irrational perception of the world (Figure 2). The higher the cost of irrationality, the greater the chance of changing attitudes towards certain events. For example, some religions consider death on the battlefield a highly respected event, but in real life, many soldiers flee because they begin to value life more. Conversely, the lower the cost of irrationality, the more harmless it is. Thus, a belief in a flat Earth or a belief in various religions, if these directions are not promoted, are quite harmless and blissful. Of course, there are situations where irrationality carries a fairly fair and justified meaning and increases social welfare. Thus, during a jury trial, not all information about the defendant may be revealed, as gender, past convictions, or appearance may affect the jury's attitude towards the case and lead to an incorrect decision.

Thus, distorted voluntary or forced perception of the world by people can lead to negative consequences for both society and themselves in future periods. People's hedonistic tendencies to perceive themselves as good and smart, as well as self-deception and the desire not to strain in the search for new and fair information, lead to decisions that are not rational, despite some situations where they may lead to healthy competition or correct decisions.

Research on the empirical data

In this paragraph, an attempt will be made to confirm or refute the information of the studied articles with empirical data. First, Brian Caplan's empirical article based on a survey of Americans and economists about the economy will be discussed. According to the survey, some conclusions can be drawn about how much the opinion of the public, which does not have a good knowledge base about how the economy functions, and economists who study the economic situation and understand the cause of events and can evaluate them from different angles, differs. In general, economists have a more positive view of the past, present and future, and their view of steady progress, despite minor difficulties, has little in common with public perceptions of stagnation and decline caused by multiple crises. The differences in the worldview of the public and economists are particularly acute in the issues of foreign aid, technological unemployment, immigration and discrimination, which society considers excessively large and unresolved, while economists pay slightly more acute

attention to the issue of slow productivity growth. However, there are issues where the opinions of both types of respondents agree: insufficient education and low savings.

It may fairly seem that the differences in the responses of these groups may differ due to living conditions. It should be borne in mind that economists are mostly white men who came from other countries, with medium or high incomes, who generally have not experienced significant life shocks over the past few years. Due to the availability of these opinions, the authors separately added control over certain variables that most acutely affect the portrait of respondents to the study. When controlling for self-serving bias, the economists' results largely coincided with the responses of the wealthy part of the population or agents with recent or expected income growth. The control of ideological biases also did not affect the results, and education had a significant impact on statistics. In general, education is aligned with economic beliefs and most educated people draw the same conclusions as economists, but the former are more optimistic about economic growth in the next five years.

That is, the analysis of the survey data shows that the beliefs between the opinion of the public and economists are quite different, and even the control of education and a biased attitude to information can explain no more than 20% between economists and the public. From which it can be concluded that political failures and ineffective policies can be a side effect of systematically biased public perceptions of the economy, the conclusions of which are distorted both by excessive confidence in uninformative beliefs actively promoted by the media, and by the presence of emotional rather than analytical interest in answers, especially in minority issues, immigration and government the cost of foreign aid.

It is necessary to consider in a more detailed way two main topics on which there are differences in both theoretical and empirical data: religion (or spirituality) and politics. Let us examine in detail the thesis regarding how religion and faith influence people's perception of the world, in relation to previous articles' thoughts that religion without propaganda does not diminish personal well-being, but can decrease it if there are any restrictions, for example, in diet, appearance, or lifestyle. According to the Gallup World Poll, positive experience, social life, optimism, and community basics indexes are higher for religious people; however, other life evaluation indexes are the same as for non-religious people (Table 1). Furthermore, religious people have more negative experiences and health problems, which may indicate the validity of the theses put forward about the restriction of a person in their own needs. In addition, the research results show a correlation between a country's GDP and spirituality (Figure 3), clearly indicating that poorer countries are more religious than wealthier ones; the wealthiest countries are twice as less religious, leading to the conclusion that religion may sometimes indeed lead to a deterioration in overall well-being.

The study of voting dynamics in the United States (Figure 4) most strongly contradicts the conclusions drawn in previous articles. For instance, we see quite high attendance in presidential elections and highly fluctuating dynamics in parliamentary votes. However, in general, about 70% of the population participates in elections, which is quite substantial. At the same time, several remarks should be made regarding this conclusion. Firstly, situations can vary significantly from country to country, and in some countries, the voter turnout is around 50%, indicating the population's uncertainty about their ability to influence the country's future. Secondly, without knowledge of the voting demographics, it is impossible to draw clear conclusions about the population's activity and preferences.

Thus, empirical data on the one hand confirm the conclusions of the articles that distorted perception of information for any reason affects the well-being of individuals and society as a whole, with this impact potentially being both positive and negative.

Conclusion and further analysis

The reviewed literature challenges the traditional view of fully rational economic agents by integrating psychological realism into economic models, considering both individual utility and public welfare. By examining cognitive dissonance, rational ignorance, and irrationality, the authors demonstrate that agents often prefer to maintain their current beliefs to preserve their self-image, even at the risk of their well-being. The theoretical integration of economic illusions aligns with observed behavior, where opinions are easily swayed due to a reluctance to invest in thorough market or political research. This understanding is crucial for developing accurate economic theories and effective policies, as maximizing public welfare does not always align with immediate individual benefits. However, strategic state intervention can enhance both private and public welfare in the long run. What is more, empirical observations in politics and religion suggest that effects of economic illusions are not uniformly negative and can even be neutral or positive for overall well-being.

Future analysis is focused on answering the research question: How do social networks and media influence the perception of economic events and people's behavior, and how do these actions affect public welfare? In the 21st century, characterized by the rapid spread of content through social networks, people tend to invest less effort in seeking reliable information. Given the growing diversity of information sources, economic agents often prefer those that confirm their existing worldview or enhance their self-perception. The research will consist of two parts: sociological survey among young people (16-27 years old), that will help to understand their views on the impact of social networks and media on their perception of economic events and a theoretical mathematical model to describe the influence of external information sources on individuals' actions and assess the risks to public welfare.

The research aims to confirm the hypothesis of the significant influence of social networks and media on the younger generation's perception of economic events. The expected results will reveal a tendency towards the preferential selection of information that enhances users' self-esteem, leading to a distorted view of reality and irrational economic decisions, affecting both economic indicators and psychological behavior.

The findings will be crucial for developing policies and strategies to improve economic literacy and the quality of information available in social networks and media. Understanding the impact of cognitive distortions on economic behavior and public welfare will aid in creating effective mechanisms for controlling and regulating information flow, thereby enhancing overall welfare and societal stability.

Appendix

Figure 1. Change in Happiness following an Income Shock

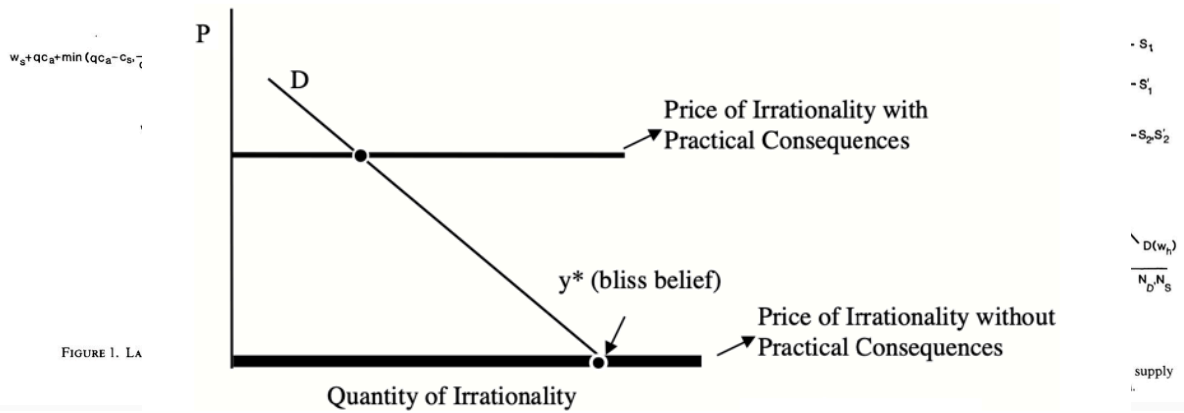


Figure 2. Individual demand for Irrationality

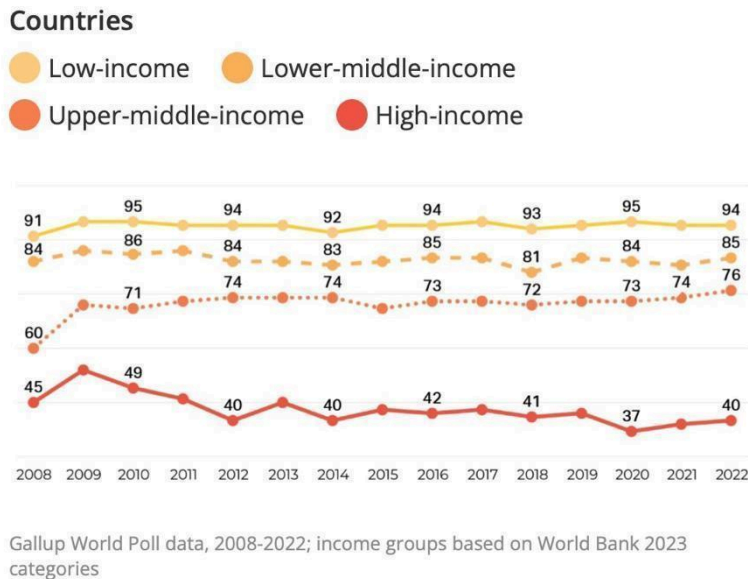


Table 1. Basic Relationship of Religiosity and Wellbeing Outcomes (Gallup World Poll data, 2012-2022)

Green color indicates religiosity related to improved wellbeing; orange color indicates religiosity has a relationship to worse wellbeing; and no shading indicates there is no effect of religiosity.

	Not religious	Religious
<u>Religious people tend to have better outcomes</u> (statistically meaningful effects)		
Positive Experience Index (experienced enjoyment, smiled/laughed a lot, treated with respect, learned something, felt well-rested)	65.0	69.0
Social Life Index (satisfied with opportunity to meet people and make friends, have people you can call on if in trouble)	73.7	77.6

Optimism Index (rate life in five years highly, standard of living getting better, local economy getting better)	48.4	49.4
Community Basics Index everyday life in a community, including environment, housing and infrastructure	55.6	59.7
<u>No meaningful difference between religious/nonreligious people</u>		
Life evaluation: Thriving (rate current life 7-10 on 0-10 scale; rate life in five years 8-10 on 0-10 scale)	27.6	26.6
Life evaluation: Suffering (rate current and future life 0-4 on 0-10 scale)	13.6	13.3
Local Economic Confidence Index (rating of current local economic conditions, local economy getting better)	5.0	5.6
<u>Religious people tend to have worse outcomes</u>		
Negative Experience Index (experienced worry, sadness, anger, stress and physical pain a lot of the previous day)	29.9	31.4
Personal Health Index (do not have health problems, feel well-rested, did not experience physical pain, worry, sadness a lot of the previous day)	68.6	66.9

Description of the wage model in hazardous production

The wage in a safe industry is fixed and equal to w_s . The demand and supply of the product in a hazardous industry are equal to $D = D(p_h)$, q – the probability of an incident which costs c_a , q^* – worker's subjective assessment of the likelihood of an accident, which is subsequently used by him instead of q . The cost of equipment in the second period is c_s and $q_a c_a > c_s$. There is also a fear, defined as

$$f = \frac{q^*}{q}, 0 \leq q^* \leq q$$

And the cost of fear, c_f . Thus, by choosing a hazardous job, agents will evaluate the costs associated with false beliefs and the costs of an accident, and if the latter are less than the former, agents will come to believe that their job is indeed safe. In other words, agents choose

$$\{q^* = 0, \text{ if } (qc_a - c_s) < \frac{c_s c_f}{qc_a + c_f} \quad q^* = \frac{qc_s}{qc_a + c_f}, \text{ if } (qc_a - c_s) > \frac{c_s c_f}{qc_a + c_f}$$

In this case, the first instance of false beliefs has a cost in the future period equal to $qc_a - c_s$, and the second instance is more expensive but leads to the purchase of equipment. Wages also differ in the first period in hazardous production because

$$w_{h_1} = w_s + qc_a + \left(qc_a - c_s, \frac{c_s c_f}{qc_a + c_f} \right)$$

In the second period, when safety equipment becomes available to workers, it is not always purchased by them due to their earlier self-assessment of the safety of their work, as agents choose safety equipment only if $q^* > \frac{qc_s}{qc_a + c_f}$ with wage equal to $w_s + c_s$.

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Corruption and Populism: the Interrelation of the Phenomena
Коррупция и популизм: взаимосвязь данных явлений

ABSTRACT.

This research paper explores a mutual influence of corruption and populism in the Russian Federation and other countries. Using qualitative methods, it examines how populists utilize anti-corruption campaign rhetoric and investigates whether they fulfill their campaign promises upon attaining political power. The article comprises a review of relevant academic literature, an analysis of the interaction between corruption and populism in six countries (including Russia), and a set of recommendations for both countering corruption and studying populism from an academic perspective. The paper also forms a scientific basis for further quantitative research of the issue. The results show that although the notion of corruption serves as a cornerstone of the populist opposition campaigns, the populists' rise to power often only exacerbates the levels of corruption in their countries. In addition, the more unstable a state's democratic and legal institutions are, the more it is likely that they will gradually erode as populists come into office.

Keywords: *corruption; populism; democratic and authoritarian political regimes; erosion of the democratic institutions; illiberal democracy.*

Introduction

The model of neoliberal democracy that has spread across the Eurasian and American continents has been subjected to various criticisms, particularly for fostering a rise of populist voices, parties, and even entire governments (O'Donnell, 2018; Sandel, 2018). However, populism has managed to settle in the political system of almost every country and has become a common phenomenon for both democratic and authoritarian regimes (Deiwiks, 2009; Bugaric, 2019).

It is imperative to acknowledge an issue that is considerably more destructive and older than populism – corruption. Acts of bribery and other forms of power abuse for personal gain are not new to humanity, yet corruption has only experienced ups and downs, but has not been finally eradicated. Modern states introduce more and more technological advances as instruments of anti-corruption policy, and the penalties for corruption offenses range from relatively mild to the most radical, such as the death penalty and life imprisonment.

Nevertheless, the subject of corruption attracts the attention not only of public officials and academia, but also of many politicians seeking power. Therefore, it often becomes a topic for speculation in a populist discourse: to attract the electorate to their side, modern oppositionists tend to label the current government as ‘corrupt elites’ and promise positive changes in exchange for a vote in their favor in elections.

However, populists in power can only exacerbate the corruption of the political system. This paper analyzes how corruption stimulates populism and how populism can become the basis for corruption to flourish. The novelty of the research and its contribution to the development of the scientific theory lies in a detailed study of the impact of governmental populism on the erosion of democratic institutions and on the growth of corruption, and thus in demonstrating the importance of studying the phenomenon of populism from the perspective of public administration as a science. Besides, it is also worth noting that this article examines the Russian case of the connection between corruption and populism, while previous studies on this topic were conducted using cases typically from the Western countries.

The aim of the paper is to determine the key aspects of mutual influence of the phenomena of corruption and populism. This article is based on the analysis of qualitative data from open sources (mass media, scientific publications, describing events in a particular country, where the link between corruption and populism is observed: Hungary, Venezuela, the US, Brazil, Israel, Russia), as well as semi-structured interviews with researchers of corruption and populism. Five interviews were conducted in total, which resulted in a saturation of theoretical information and data. Three respondents (Expert 1, Expert 2, Expert 3) are representatives of the Laboratory for Anti-Corruption Policy of the National Research University Higher School of Economics; one of the interviewees is the Head of the Centre for Ethnopolitical Studies of the Institute of Europe of the Russian Academy of Sciences (Expert 4); Expert 5 is the Academic Director of the Doctoral School of International Relations and Regional Studies of the National Research University Higher School of Economics.

Literature review

In defining the phenomenon of corruption, on which we will rely hereafter, this article turns to a comprehensive descriptive work by Jain (2001, p. 73), where corruption is conceptualized as a set of “activities in which public officials, bureaucrats, legislators, and politicians use powers delegated to them by the public to further their own economic interests at the expense of the common good”.

Mudde (2004, p. 543) gives the following definition to the concept of populism: “an ideology that divides society into two homogeneous and antagonistic groups, the ‘pure people’ versus the ‘corrupt elites’, and that holds that politics should represent the common will of the people”. Notably, in this definition, ‘the people’ can be either the population of an entire country, a particular ideological group (characteristic of right-wing populism) or a particular social class (characteristic of left-wing populism). Also, populism always contrasts ‘people’ with ‘others’, whether elites or, in rarer cases, other groups such as national minorities and immigrants (Deiwiks, 2009).

This paper categorizes corruption (where appropriate) into ‘petty’ (i.e. low-level) and ‘grand’ (i.e. high-level), following the typology detailed in (Bussell, 2015). In turn, populism is divided into ‘oppositional populism’ (i.e. populism of the opposition) and ‘governmental populism’ (i.e. populism of the politicians in power) as in the research by Caiani & Graziano (2022). Such a classification makes it possible to draw a holistic picture of the practical interaction between the two phenomena.

As Mendilow (2021) notes, there is an imbalance in the academic studies of the interrelation of populism and corruption. While researchers of the former phenomenon have generally concluded that the anti-corruption agenda constitutes the bedrock of populist campaigns, scholars studying corruption rarely mention its diverse intersections with populism. In practice, however, the concepts are often interconnected in the following way: corrupt individuals use populist rhetoric to ‘mask’ their crimes, while populists exploit the anti-corruption narratives to attract gullible voters to their side. Populists actively exploit the idea that the establishment is working against the public interest and condemn corruption to attract the electorate to their side, as well as to cover up corruption within their ranks, thereby provoking its growth.

Apolte (2022) also contributes to the study of the relationship between the phenomena considered by arguing that populism, corruption, and a lack of separation of powers lead democracies down the path towards authoritarianism, once again emphasizing the destructive potential of these concepts.

Thus, the interaction of corruption and populism, often manifested in the manipulation of public consciousness for the purpose of abuse of power, may have an extremely negative impact on the development of the state. Consequently, this article proposes the following research hypothesis: the key threat from populist forces in power exploiting the rhetoric of fighting corruption is their potentially destructive impact on the state democratic institutions for personal gain.

Results

The results of the empirical analysis of open online sources and expert interviews show that in countries with weak democratic institutions (the article draws examples of Hungary after the fall of the communist regime and Venezuela) the rise to power of populists who based their election campaigns on anti-corruption rhetoric (Viktor Orbán and Hugo Chávez) led to the destruction of democratic institutions and the growth of corruption (especially in Venezuela). Thus, after Orbán’s ‘Fidesz’ party won an absolute majority in the parliament, Hungary followed a path from a free country to a real-life example of the model of ‘illiberal democracy’ (King, 2017) or the system of government where some democratic institutions are formally preserved and coexist with “the conditions of stepping beyond democratic procedures” (Buzogány, 2017). Regarding Hungary’s Latino American counterpart, after Chávez-led populist socialists came to power in Venezuela, the country’s governing institutions collapsed, resulting in a hypertrophic increase in corruption in the governing apparatus, leading to the emergence of an organized mafia made up of former military elites and revolutionaries (Maya, 2018).

Contrastingly, in countries with noticeably more stable democratic / legal institutions: the United States under Donald Trump's rule and Brazil under Jair Bolsonaro's administration, there has been only a small negative impact of populists in power on the quality of institutions. Nevertheless, both Trump and Bolsonaro have not kept their populist campaign promises to fight corruption. The US president has been the subject of several prosecutions for abuse of power, conflicts of interest and other corrupt practices ("President Trump's legacy of corruption, four years and 3,700 conflicts of interest later", 2021; "Exposing Trump's Deals", 2024). And Brazil's president Bolsonaro has been credibly accused of bringing his inner circle into executive positions and then involving his family and friends in corruption schemes (Eisen & Porcile, 2020).

The case of another country with strong state institutions, Israel, shows how populist leaders can use corruption to their advantage. Consider the example of Benjamin Netanyahu, who has been accused of corruption, illegal acceptance of gifts worth at least one million shekels, and abuse of public trust. In court the prime minister's defense framework was filled with populist narratives, such as the 'good us and bad them' one, which can be traced, for instance, in Netanyahu's statement: "The witch-hunt against us continues" (Kubbe & Harel-Fisher, 2021). This led to Netanyahu being able to maintain support among the public and the prosecution not providing enough evidence for the politician to be punished ("Israel PM Netanyahu faces corruption charges", 2018). Nevertheless, it is not known for certain whether Netanyahu was guilty and corrupt. However, years of litigation accompanied by Netanyahu's 'romantic-populist' speeches have delegitimized the country's legal system and polarized the population into two camps: one that sees the prime minister as an immoral criminal, and the other that sees him as a leader fully committed to the prosperity of the nation, a victim of the elites who neglect the future of the state (Kubbe & Harel-Fisher, 2021).

To illustrate the impact of populists who came to power with a vivid anti-corruption campaign on the quality of institutions in their countries, this article turns to the Democracy Index by the Economist Intelligence Unit (Democracy Index, 2022), although not ideal, but a quite handy measure for comparative analysis (Table 1). As one can see, after Orbán had become the prime minister of Hungary in 2010, the index value for the country declined from 7.21 to 6.64 as a result of his 12 years in office. Moreover, in Venezuela under Chavez the index score dropped from 5.42 in 2006 (the year the Democracy Index was first compiled) to 5.12 in 2022. On the contrary, for the US after Trump's election, this change was only -0.13. The situation is similar in Brazil: during the four years of Bolsonaro's rule, the index value also declined modestly from 6.86 to 6.78 in 2022. However, it is worth noting that in Netanyahu's Israel there was an increase in the index score from 7.48 to 7.97 in 12 years.

These data support the assumption that in countries with strong institutions, the rise of populists to power will not have the same negative effect as in less institutionally developed states. This partly explains why the rise of Trump and Bolsonaro to power in the US and Brazil, respectively, did not put the countries on the path of 'illiberal democracy', as well as why Israel saw democracy flourish with a populist as prime minister, while the relatively weak democratic institutions of Hungary and Venezuela were damaged more significantly.

Table 1. Foreign states in the Democracy Index

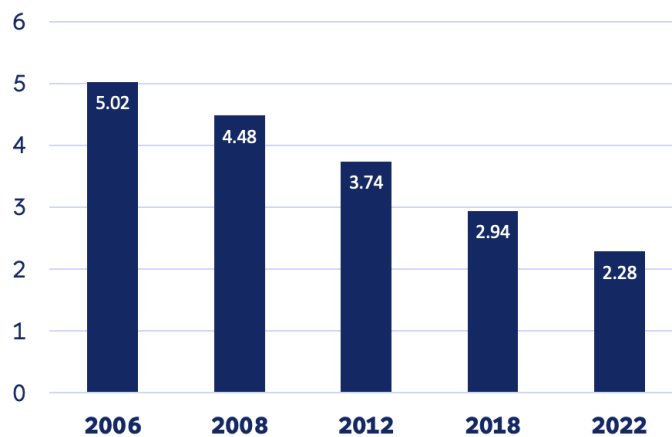
Country name	Index value the year "populists" come to power	Index value in 2022
Hungary	7.21	6.64
Venezuela	5.42	5.12
USA	7.98	7.85
Brazil	6.86	6.78
Israel	7.48	7.97

Note. Red color reflects the category of countries where one or another manifestation of the relationship between corruption and populism in power has led to a significant erosion of the democratic institutions, yellow indicates a less negative impact, and green is the color that signals that the situation regarding democracy in the country has not deteriorated.

In the Russian case, the relationship between corruption and populism is non-linear. According to the latest data, more than 80% of the Russian population (Faulconbridge, 2024) support the current president. Accordingly, there is no practical sense in distracting the public from the problems of corruption: “the citizens already know that they will not be able to oppose it [corruption]” (direct quote: Expert 4). Yet the issue of corruption (mainly grand one) is indeed present in Russia: “as the vertical power structure was strengthened, strong relationships were gradually built at high levels, and a corruption component was embedded into the system of domestic [Russian] public administration” (direct quote: Expert 1). Nevertheless, we can conclude that in Russia, the links between corruption and populism at the level of government are rather insignificant. At the same time, in the North and South America, Europe, and the Middle East cases, such mutual influence is more evident (this is largely due to the type of political culture in each of the states being analyzed).

In terms of the development of democratic institutions, Russia is closer to Hungary and Venezuela than to the US, Brazil, and Israel, so the following data (Democracy Index, 2022) are not surprising: in Russia the Democracy Index value has decreased from 5.02 in 2006 (when it began to be calculated) to 2.28 in 2022 (Figure 1).

Figure 1. Russia in the Democracy Index



The situation with the (non-parliamentary) opposition in Russia is different. As in countries with democratic regimes, the Russian opposition focuses its supporters' attention on the corruption of the authorities, making constant references to the populist concept of 'the people versus the elites' (Expert 3, Expert 4). Some Russian populists in the opposition tend to emphasize the corruption of the ruling powers as an exceptional shortcoming of the current regime (Expert 3).

However, in general, as the interviewed researcher into European populism notes: "the main difference between domestic [Russian] populism and populism in the West is ideological" (direct quote: Expert 5). For example, in the context of liberal democratic regimes, populism is considered an ideology. Its fusion with nationalism or conservatism results in right-wing populism, while the mixing of populism and socialism entails left-wing populism. In Russia, the political field is de-ideologized. Neither the ruling party nor the opposition has a coherent ideology (Expert 5). Therefore, in Russian science, populism is rather perceived as a pragmatic means of influencing society to intensify the information campaigns. Thus, populism in the West is a product of liberal democracy and the active participation of citizens in the political life of the state, while in Russia, on the contrary, it is a consequence of the weak involvement of the public in politics. "Democratic populism is always coloured in ideological tones, while the Russian specificity of populism lies in its mobilizing potential to solve both classic populist tasks, as well as not so trivial ones, such as, for example, preserving the status quo" (direct quote: Expert 5).

Recommendations

The results of the empirical analysis prompt some recommendatory considerations, primarily for preventing corruption. First, the fight against corruption should not be carried out within the framework of populist theses proposing to execute or imprison corrupt officials for life. Anti-corruption policy should follow a systemic approach, not a spectacular one, yet truly efficient. Most certainly, in terms of the impact on society, jailing a federal minister is much more impressive than gradually building an institutional environment that minimizes corruption risks. This is why several media outlets tend to label anti-corruption policy in Russia as a "failure and catastrophe" (direct quote: Expert 3), although in fact the Russian systemic fight against corruption has achieved significant successes at the grassroots (petty) level.

Nonetheless, it is quite problematic to formulate practical recommendations regarding the Russian grand corruption. Certainly, the sanctions should be commensurate with the potential benefits of engaging in corrupt relations. However, according to the experts interviewed, proposals to introduce radical punitive measures for corruption are just a populist technique. For example, public calls for the death penalty for such offenses make no sense from both efficiency and ethics points of view as, when imposing the capital punishment, the court may simply make a mistake, the price of which would be too high.

Therefore, it is not the severity of punishment, but its inevitability that is paramount in this issue. The Russian anti-corruption legislation is indeed rather effective from a legal point of view, but according to the experts interviewed, a significant number of Russians still have a compromising attitude towards corruption. In turn, the inevitability of the punishment is achieved primarily by fostering public contempt for corruption. As an expert of the Laboratory for Anti-Corruption Policy of the National Research University Higher School of Economics states: "I am in favor of leaving everything in Russia as it is but making anti-corruption punishment inevitable. This is possible through education. When the public understands why these laws are needed and how they work, they will work much more effectively" (direct quote: Expert 2).

Furthermore, another important problem is the fact that the phenomenon of populism is almost completely ignored by public administration as a science. For example, the issue

of corruption is studied not only by public administration researchers, but also by political and legal scientists, economists, sociologists, and psychologists (Jancsics, 2014; Dimant & Schulte, 2016). However, populism is an unpopular topic in the Russian academic space even though, as this paper shows, this phenomenon has a high destructive potential for the quality of state institutions. As the empirical analysis suggests, when populist ‘corruption fighters’ come to power, they may well create their own corrupt system of governance, replacing some ‘thieving officials’ with new loyal ones, some established relations with other ones. Therefore, it is important to vigorously study populism not only in its pure form within the framework of political science, but also in interaction with phenomena from other areas of scientific knowledge to make academic and applied public administration as profound and efficient as possible.

Conclusion

Thus, it can be argued that we are dealing with a paradox (Eisen & Porcile, 2020): populists actively exploit the anti-corruption agenda during their election campaigns; however, those of them who do eventually come to power may put the old ‘corrupt elite’ on trial, while contributing to the establishment of a new one, often becoming a part of it. Once in power, populists can effortlessly steer the country down the path of ‘illiberal democracy’, gradually destroying the institutions that were formed to protect the rights and freedoms of the citizens.

Depending on their ideological orientation, populists in the opposition can choose a certain aspect of the state policy, in their opinion not satisfying the needs of the public, as a key feature of their agitation. These may be themes of immigration, supranational institutions, or class inequality. Nevertheless, whatever the views of opposition populists, their rhetoric always hinges on the thesis of ‘corrupt elites’. Here, opposition populism divides the country’s population into two homogeneous groups: the ‘good population’ who are the victims of the policies of the second group – the ‘corrupt authorities’. Although this presentation is typically factually inaccurate, it is always aimed at the emotions of the electorate, at provoking the population’s anger against the current government.

Therefore, the opposition quite often resorts to exploiting the theme of corruption, but when populist opposition figures are in power, not all of them continue to appeal to this idea. For example, the Russian authorities are currently organizing systemic measures to fight petty corruption, while simultaneously the representatives of the ‘United Russia’ party prefer not to touch upon the topic of countering grand corruption (Expert 4). The governmental populism in Russia is not aimed at creating a false appearance of active anti-corruption activities; rather, it focuses on ‘more important things’ (national identity and the correctness of the foreign policy) to maintain the electorate’s loyalty.

The initial research hypothesis was confirmed, and the following trends can be highlighted. First, politicians quite frequently resort to aggressive anti-corruption populism and harshly criticize the ‘corrupt authorities’ during the election campaigns, which makes it easy for them to win popular support. Second, if populists come to power in this way, two scenarios are possible. In the first one, they start to follow their promises, introduce systemic measures to fight corruption without encroaching on the destruction of democratic institutions. In the second case, the elected populist government becomes a new stronghold of corruption, seeking to maximize personal benefits. In this scenario, if the country lacks strong and developed democratic institutions, there is a serious risk that under populist control it will follow the path of so-called ‘illiberal democracy’. That is, already weak institutions will be deliberately destroyed: the new elite may fail to respect the principle of the separation of powers by taking control of the courts, occupying parliament, illegally interfering in the electoral system and in the other political processes. In a situation of a violation of the system of checks and balances, high-ranking civil servants (and their

cronies) have both the opportunities and the incentives to abuse their power with near impunity.

Hence, these results allow to formulate the main conclusion of this paper. The interaction between corruption and populism can have a devastating effect on the state of democracy in a country, which makes it necessary to study the causes and consequences of this relationship. Still, it is also worth noting that the present article provides an examination of the research problem using qualitative methods that enables the identification of the main trends but does not provide any statistical assessments. Consequently, a scientific basis for further in-depth quantitative analyses of the impact of corruption on populism and populism on corruption has been formulated, as this topic leaves room for future research.

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Factors Affecting Donations's Size and Regularity to the Perm Shelter “Matroskin”
Факторы, влияющие на размер и регулярность пожертвований пермскому приюту «Матроскин»

ABSTRACT.

Exploring an audience and attracting new donors are essential practical tasks for charitable organizations. The article investigates the factors that influence the regularity and amount of donations to the "Matroskin" cat shelter in Perm. The study employs a mixed methodology that combines qualitative and quantitative analysis techniques. Through semi-structured interviews with donors, the study identified three groups of factors that influence donor behavior: lifestyle, social environment, and attitude towards the shelter. Subsequently, a survey was conducted among hundreds of donors to collect quantitative data. Using regression analysis, two models were developed to illustrate the influence of these factors on the size and frequency of donations. Based on the findings, practical recommendations are presented for management and staff of the Matroskin shelter to assist in their work with the audience.

Keywords: *non-profit organization; charitable shelter; donations; size of donations; regularity of donations; research of the shelter audience; marketing research in non-profit organizations*

Problem Statement

Currently, non-governmental charitable organizations (NGOs) are experiencing difficulties in financing their operations due to, among other factors, decline in the growth of the number and value of donations from private individuals. For instance, the "Benchmarking NGOs" project from the Need Help Foundation and the CloudPayments service have noted that the overall increase in donations to NGOs in 2022 was 3%, while inflation increased by 12% over the same period, resulting in a decrease in real income for non-profit organizations. (Бенчмаркинг НКО, 2023). At the same time, it is challenging to draw conclusions regarding the reasons for the decline in the growth of donations. This is due to the lack of research and empirical data on donor behavior, including which individuals tend to contribute to non-profit organizations and what factors influence their

actions as donors. This issue affects the ability to create a profile of a typical donor. However, the presence of distinct characteristics of a donor for a specific charity organization may make it easier to engage and retain its audience within the information sphere.

Therefore, researching one's audience and attracting new contributors are significant practical objectives for charities. This challenge is particularly relevant for smaller regional organizations, which typically lack the additional resources to conduct independent market research. This article aims to investigate the factors that influence the patterns of donor behavior at the Matroskin Charity Shelter, the largest private animal shelter for cats in the Perm region. The purpose of this research is to identify these factors in order to understand the size and frequency of donations from individual donors to the shelter.

The research questions that we pose are:

1. What are the factors that influence the amount and frequency of donations to the Matroskin Shelter?

2. How does a donor's lifestyle (a combination of socio-demographic characteristics) affect their donations to the shelter?

3. What role does the social network and environment of donors play in determining their donations to the charity?

4. To what extent do attitudes towards the shelter influence donations, and how do these attitudes manifest themselves in terms of donation size and frequency? The answers to these questions will, first and foremost, be useful for the management and staff of the Perm "Matroskin" shelter. The findings of the study could be used to better understand the target audience of the shelter and to make informed decisions regarding its marketing strategies. For example, the results could help determine which segments of the population the shelter should target with its advertising campaigns, or how to best communicate with its audience through social media.

We also believe that the methodology employed in this study could serve as a model or guide for future research into similar shelters in other regions. The findings could provide valuable insights into the needs and preferences of homeless animal advocates and help inform the development of more effective outreach and fundraising strategies.

Research methodology

An empirical study of factors influencing the regularity and size of donations to the Matroskin shelter consists of two stages and covers qualitative and quantitative methods of collecting information.

Stage 1. Qualitative study of factors influencing donations to the Matroskin shelter

A qualitative study using interviews was conducted to explore donor behavior patterns. Only through interviews is it possible to directly contact donors and learn in more detail about their past and current experience of helping the shelter, which will provide more accurate information for the formation of qualitative hypotheses about the factors influencing changes in support practices.

Stage 2. Quantitative study of factors influencing donations to the Matroskin shelter

A quantitative study was conducted in order to identify factors influencing the frequency and size of donations. An online survey was chosen as a tool, the basis of which consists of 12 factors influencing the size and regularity of donations, identified at the previous stage (interview). The survey was distributed through the shelter community on VKontakte, also with the help of the Kotovsky cat cafe, which is part of the fund along with the shelter. In addition, the survey was sent to respondents who had previously participated in the interview.

The sample size was 101 respondents, of which 96% were women and 4% were men. Based on the statistics of subscribers to the shelter community on VKontakte, it is assumed that the general population consists of 87% women and 13% men. Therefore, the resulting sample is slightly biased towards women. The respondents' ages ranged from 18 to 56 years. Among the respondents, 27% make recurring donations, 51% from time to time, 22% made one-time donations (1-2 times). In addition, when comparing the data obtained from the survey and secondary data, a bias towards larger size was noticed (Table No. 1). This can be explained by the fact that the survey was completed by a dedicated audience of the shelter, whose donations are larger than others.

Results of qualitative research

The information obtained from the interviews served as the basis for qualitative hypotheses about the factors influencing the size and regularity of monetary donations to the Matroskin shelter (Table 1).

Table 1. Hypotheses about the factors influencing the size and regularity of monetary donations to the Matroskin shelter

Ideas from the interview	Hypothesis
The most popular way to help the shelter is monetary donations	People donate less money and less regularly when they are also involved in other forms of helping the shelter
Donors are people with higher education, without children, with a permanent job and income, who had or have an animal	1. People with higher incomes tend to make larger and more regular donations;
The reasons that prompted you to start donating - the appearance of an animal, or a personal motive to do something good	2. People with higher education give more money and more regularly than people with other education;
Average donations range from 1000 to 2000 rubles, depending on income	3. People with full-time jobs give more money and more regularly than people with part-time jobs;
	4. People with children give less money and less regularly than those without children;
	5. People who have their own pets donate less money and less regularly to the shelter
The main point of interaction with donors is the VKontakte group	1. Then the level of trust in the shelter higher, people donate more money and more regularly;
The frequency of translations is greatly influenced by the elaboration of posts in the VKontakte group	2. People who follow news and posts on the shelter's social networks donate more money and more regularly
As a method of transferring money, they use either the group of VKontakte or configured automatic payments in the bank	
Donors do not tell their friends that	1. People who have friends

they are helping the shelter, but they talk about the shelter itself and the cat cafe. Thus, friends also begin to follow and help the shelter	around them who work at Matroskin will donate more money and more regularly than those who do not have such friends; 2. People whose immediate circle is involved in charity donate more money and regularly
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The hypotheses were confirmed or refuted during the quantitative research stage.

Results of quantitative research

Results of factor analysis

The possibility of conducting the principal components analysis (PCA) is assessed using the adequacy measure and the Bartlett criterion. The measure of sampling adequacy was 0.756, which is more than 0.5, therefore, factor analysis can be performed. In turn, the significance of Bartlett's criterion of sphericity is 0.000, which is less than 0.01, therefore, at the 1% level of significance, we can accept the hypothesis that the correlation matrix is not single, and accordingly, the possibility of conducting factor analysis was again confirmed.

According to the results of PCA using the Varimax rotation method, 4 components were formed that explain 65.4% of the total variance. Thus, the resulting components were interpreted as follows: the first component is information about the activities of the shelter as a whole, the second is the shelter community on VKontakte, the third is the social environment or environment, the fourth is the lifestyle of the donor.

Results of multiple regression analysis

The next stage of the quantitative study consisted of conducting two regression analyses. The first regression model is multiple regression, where the dependent variable is the size of the donation.

Before conducting regression, the Kolmogorov-Smirnov test showed that the distribution of the dependent variable was not normal, therefore, regression analysis was impossible. Accordingly, in order to make the distribution of the donation amount normal, the logarithm of this variable was carried out, according to the results of which the Kolmogorov-Smirnov test showed that the distribution had become normal, therefore, regression analysis can be performed.

The quality results of the multiple regression model showed the following. First, the adjusted R-squared was 30.2%, indicating that the model explained 30.2% of the variance. The significance of the F-statistic was 0.000, which is less than 0.01, therefore, at the 1% level of significance, we can accept the hypothesis that at least 1 variable affects the size of the donation. Thus, the results of this model can be interpreted.

The multiple regression model proved the influence of only two factors. Thus, the significance level of the first factor was 0.089, which is less than 0.1, therefore, at a 10% significance level, we can accept the hypothesis that if a donor has a pet, he will donate more. This finding refutes the hypothesis of our study, since it was assumed that the size of the donation of people with pets is less than that of others. However, there is an explanation for this; people with pets are likely to be more aware of the high cost of pet products and empathetic towards them, since they can transfer the suffering of someone else's animal to their own, as a result of which the size of their donation increases. In turn, it was initially assumed that people with pets donate less, since they have expenses for their pet, and accordingly, the donation for a shelter animal is less. Thus, if the donor has a pet, then the donation amount increases by 55%, all other things being equal.

In addition, the influence of the second factor, the lifestyle of the donor (the fourth component obtained thanks to the PCA), was confirmed. The significance level of the first

factor was 0.000, which is less than 0.01, therefore, at a 1% significance level, we can accept the hypothesis that the donor's lifestyle has a positive effect on the size of the donation. Thus, the higher the level of education, the level of income and the higher the employment of the donor, the higher the size of the donation by 48.1%, all other things being equal.

To summarize, it is worth noting that multiple regression made it possible to partially confirm 3 research hypotheses and partially refute one.

Results of logistic regression analysis

A logistic regression analysis was necessary to identify factors influencing the regularity of donations. Based on the data obtained from the survey, the donation amount is higher for recurring donors, and they donate regularly; accordingly, this is the most attractive segment for the Matroskin shelter, therefore, in logistic regression, the dependent variable is the regularity of donations from three segments: recurrent, "from time to time" and "as it turns out" donations. In addition, it is worth noting that for interpretation, a model was taken without components, but with all variables from the survey, since in this case there are a larger number of significant factors.

The quality of the logistic regression model can be interpreted using the Cox and Snell R square, which was 33.9%. This indicates that the model explains 33.9% of the variance. In addition, the accuracy rate of the constructed model was 66.9%, which means that the model guessed 66.9% of the 101 options. Thus, the quality indicators of this model allow interpretation of the obtained values.

In total, 12 variables which influence the regularity of donations have been identified:

1. When the donation size increases by 1 ruble, the chances that a typical donor will donate regularly increase by 1.001 times. This may be explained by the fact that our survey is biased toward larger donations;
2. If a typical respondent knows shelter workers, the odds that they will donate regularly increase by 5.122 times. Shelter employees can talk about the shelter, inspire confidence in the donor and motivate them to do a good deed;
3. The more attention a typical respondent has to a shelter's posts, the more likely they are to donate regularly, by a factor of 3.079. This is because an engaged shelter audience that pays attention to shelter posts can donate regularly;
4. The higher the awareness of a typical respondent about the activities of the shelter, the higher the chances are 2.657 times that he will donate regularly. It is assumed that awareness of the shelter allows donors to be reminded of it, thereby ensuring regularity of donations;
5. The higher a typical respondent's confidence in the shelter's use of funds, the 15.908 times more likely they are to donate regularly. It is important for donors to know that their donations will be used for their intended purpose;
6. Typical respondents with incomplete higher education, compared to respondents with higher education, are less likely to donate regularly;
7. A typical respondent with secondary vocational or special education has 7 times higher chances of donating regularly compared to a respondent with higher education;
8. The higher the income level of a typical respondent, the 3.048 times higher the odds that they will donate regularly (at the 5% significance level). This is confirmed by the fact that more income gives people the opportunity to help others using free funds;
9. The higher the age of a typical respondent, the 1.068 times higher the odds that he will give regularly (at the 10% significance level). As a rule, older

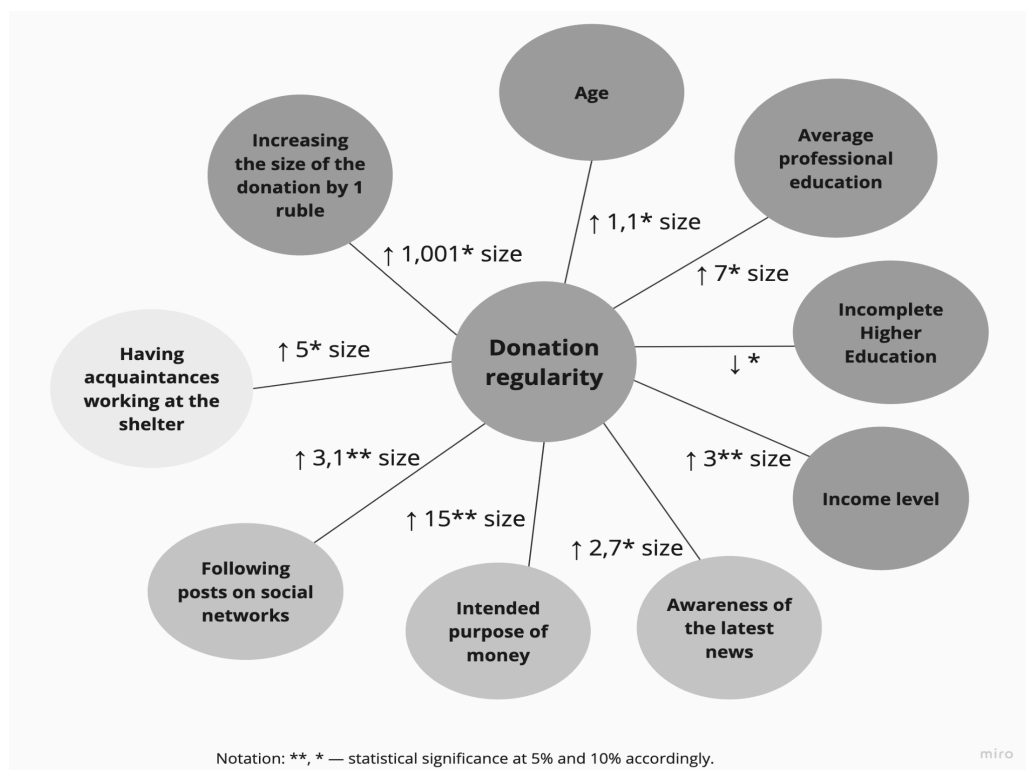
generations have more stable incomes than younger ones, so they can donate regularly.

However, three of the identified variables were not included in the study due to their contradiction with common sense. According to the results, increasing the frequency of viewing posts, increasing the respondent's satisfaction with the use of funds at the shelter, and increasing the availability of information about the shelter decreased the chances that a donor would give regularly. This contradiction could be for a number of reasons. First, it is possible that a key variable was omitted during the design of the survey, causing the variables to contradict each other. Secondly, the sample size was 101 respondents, which can also distort the results. In addition, it is assumed that the variables influence each other, which could possibly bias the results. In order to evaluate the influence of variables on each other, a different type of analysis is required, which is a prerequisite for future research.

Moving on to confirmed and non-contradictory hypotheses, it is worth noting that they can be combined into several groups (Fig. 1). The first group includes an additional effect associated with an increase in the donation amount. The second group consists of one factor, namely acquaintance with an employee of the Matroskin shelter. The third group is related to the shelter's management of the VKontakte social network. Finally, the fourth group is characterized by the socio-demographic characteristics of the donors.

Summarizing the results of the two regression analyzes carried out, it is worth noting that out of all 12 research hypotheses, one was completely confirmed, five were partially confirmed, and one was partially refuted. Thus, the hypothesis about the influence of income level on the regularity and size of donations was fully confirmed. The influence of having a higher education, viewing news and posts, trust in the shelter, and having friends working at the shelter on the regularity and frequency of donations was partially confirmed. The hypothesis that people without pets donate less and less frequently was partially refuted. On the contrary, the study results showed that donors with pets give more regularly.

Figure 1. Combining factors influencing regularity by semantic groups



Practical recommendations to the management and staff of the Matroskin shelter

Every year, the shelters' demand for cash donations increases, as does the number of people who contribute to charitable foundations (Исследование благотворительности в России, 2023). The main goal for the shelter is to attract a group of recurring donors who will donate regularly and in relatively large amounts, which will allow the shelter to have confidence in the stability of its income. Shelter foundations need to know how and to which audience they should direct their advertising campaigns in order to attract these donors. Based on the study results, recommendations were made for volunteers working in shelters, and in particular for volunteers at the Matroskin shelter.

Firstly, it is essential for the shelter to effectively engage with its audience through social media. The study has found that donors' confidence in the use of their donations increases the likelihood of regular donations by 15 times. Therefore, fundraisers should collect and publish data on income and expenses more frequently and openly. We recommend publishing weekly reports on the Vkontakte page, using infographics to clearly show the audience where the funds are being spent.

Secondly, shelters should improve their social media marketing (SMM) efforts. The survey results indicate that tracking posts on social networks and raising awareness of recent events can increase the chances of a donor donating regularly by 3.1 times and 2.7 times, respectively. To attract more benefactors willing to donate regularly, the shelter should use new and innovative formats of interaction with its audience on social media. For example, they could create short videos using popular templates (popular "sounds" in VK Clips, YouTube Shorts) or conduct live broadcasts or videos featuring the animals in need of a new home. Additionally, it is recommended to explore new channels for advertising ongoing events to increase awareness among potential recurring donors. This could include targeted advertising on websites popular among the target audience.

Thirdly, employees who volunteer at the shelter should talk more about their work, creating a "word of mouth" effect. This will help to position the shelter as a friendly and welcoming place where everyone knows each other. As the study showed, the presence of friends working at the shelter increases the chance of a donor becoming a recurring donor by 5 times. Therefore, by involving friends and informing as many people as possible about the shelter, volunteers can help to increase the number of recurring donors. It is important to tell volunteers about the benefits of their involvement in attracting new donors. Most likely, volunteers are interested in helping the shelter grow and increase its budget for maintenance. However, they may not be aware that they can have a significant impact on attracting recurring donors. The shelter could also involve subscribers in events, where they can act as volunteers themselves. Now, for example, there is a "Point of Goodness" campaign that is held periodically, in which car volunteers are required to participate. These volunteers are willing to provide their cars to collect items that may be useful for the shelter. As a result, the shelter is trying to engage potential volunteers more actively, so that they may become regular donors in the future.

Fourth, the shelter's staff is recommended to collect data on event attendance in order to adjust the event format if necessary. Therefore, we propose holding more events where volunteers have the opportunity to engage with visitors and involve them in the shelter's activities, thus encouraging them to become regular donors in the future.

It's also worth noting that, based on the data collected, it's important for donors to stay informed about the shelter's events and activities. This is similar to how you feel when you follow someone close and significant in your life. Therefore, the shelter needs to build its image as a trustworthy organization that is always there for its benefactors, like a family or close friend.

Finally, based on the data we have collected on the influence of certain socio-demographic factors (which we cannot directly control), we propose to target the advertising towards a specific segment of donors based on the size of their donations. Specifically, the shelter's efforts should be focused on advertising to people who own pets, have a university degree, work full-time, and earn an average or higher income. These donors tend to give the largest amounts of money.

Conclusion

The issue of how to attract more donors and volunteers to support animal shelters is a challenge faced by all shelter owners and animal welfare organizations. Currently, this topic seems to be under-researched in the Russian academic community. Our study aimed to identify factors that influence the amount and frequency of monetary donations to the Matroskin Animal Shelter. The findings from this study may be valuable for future research in this area.

There are studies in the scientific literature on the topic of charity, which confirm the existence of factors that influence the behavior of donors towards various foundations. However, these studies have several limitations. Firstly, many of them were conducted several years ago and their results might be outdated (Brown, 2004; Bekkers, 2008). Secondly, most research on this topic has been conducted abroad (Wiepking, 2007; Cowley, 2011), and the results of these studies cannot be fully applied to the Russian context, as the behavior of philanthropists in different countries has significant socio-cultural differences. Finally, previous studies only examined a limited number of factors (mainly 2 or 3). In our research, we attempted to identify and analyze as many factors as possible that affect the behavior of donors, and we were able to identify a total of 9 factors.

In the course of the study, a theoretical review of existing literature on charity was conducted, and a methodology for data collection was developed. Using interviews, statistical data from the shelter and a survey of donors, data was collected for analysis. Additionally, factors influencing the size and frequency of donations from Matroskin donors were statistically identified. The findings of the research can be utilized by the owners, volunteers, and other animal shelters to attract larger and more consistent donations.

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Building ethnic stereotypes in cinematic discourse

Построение этнических стереотипов в кинематографическом дискурсе

ABSTRACT.

This research examines linguistic and visual means used in American fiction films to create ethnic stereotypes. We treat fiction films as multimodal texts belonging to a cinematic discourse. To convey their messages, the authors appeal to some prior knowledge of recipients. It takes the shape of stereotypical representations of foreigners as ethnic groups sharing features and values that are set in contrast to those of American culture. It manifests the opposition of “us” and “them” expressed with the help of verbal and non-verbal semiotic modes. The purpose of this study is to explore the linguistic and visual elements of cinematic texts that are employed to build stereotypes about ethnic groups in modern American cinematic texts. The material includes fiction films featuring Russians and Mexicans. The research is set in the framework of multimodal discourse analysis and uses the principles of cognitive stylistics. The findings reveal visual metaphors and metonymies as well as verbal rhetorical means used in American cinematic texts to portray ethnic groups in a stereotypical way. The research also elucidates the symbolic role of lighting, costumes, and colour in building ethnic stereotypes in multimodal cinematic texts.

Keywords: *cinematic discourse; ethnic stereotypes; auto stereotypes; hetero stereotypes; cross cultural communication; Russia; Mexico*

Introduction

Contemporary cinematography serves as a platform for constructing, disseminating, and normalizing stereotypes. Consequently, examining the portrayal of stereotypes in cinematic discourse, specifically concerning Russians and Mexicans, acquires relevance. The purpose of this study is to investigate the linguistic and visual elements in cinematic texts used to construct stereotypes about ethnic groups. To this end, the study's objectives include elucidating the role of linguistic and visual aspects, conducting a multimodal analysis of four sample motion pictures, and drawing conclusions based on the identified patterns. The hypothesis of the research is as follows: the multimodal elements of cinematic texts reinforce hetero stereotypes about Mexicans and Russians and conflict with the actual perceptions of the represented groups. To test the hypothesis, an empirical study set within the integrated framework, which includes multimodal discourse analysis, stylistic analysis, and contextual analysis has been carried out.

The sample is based on four American feature films produced in 2004-2019 which belong to the genre of action and contain some stereotypical images of ethnic groups.

The concept of social stereotypes was introduced by the American scholar W. Lippman. The essence of stereotyping is that it is inherent in an individual to accumulate previous experience in order to apply this knowledge to a new situation (Lippman, 1992). Traditional public institutions are primarily involved in the formation of stereotypes, with the media becoming the second most important source.

Feature films are seen as multimodal texts that incorporate semiotic codes and have linguistic, aural, and pictorial underpinnings. These films utilize a combination of signs and symbols to convey meanings that transcend the literal narrative, engaging viewers through a complex interplay of language, sound, and imagery (Prasolova & Pavlina, 2022).

Ethnic stereotypes reflected in films are far from unambiguous, and their study allows us to get an idea of how this or that nation perceives an external group, forming hetero stereotypes. The portrayal of ethnic groups in cinema can reveal underlying societal attitudes and biases, demonstrating how one culture views another and reinforcing preconceived notions about “the other.”

The formation of auto and hetero stereotypes hinges on the dichotomy “us/them”, which acquires special significance in cinematic discourse. This dichotomy is a fundamental aspect of human cognition, influencing how individuals and groups differentiate themselves from others (Maksimova et al., 2021; Lapteva, 2017; Pavlina, 2022). In film, this differentiation is often accentuated, with the portrayal of “us” typically embodying positive attributes, while “them” is frequently depicted in a negative light. This dichotomy not only reinforces existing stereotypes but also shapes viewers' perceptions and attitudes towards different ethnic groups.

Often, the pejorative portrayal of “them” is contrasted with the values of “us”, creating a narrative that emphasizes the superiority of one's own group over others. This narrative technique serves to strengthen in-group cohesion and validate the cultural and moral standards of the "us" group. By examining how ethnic stereotypes are formed and enhanced in modern cinematic discourse, we can gain insights into the processes by which films perpetuate cultural biases and influence public perception. Let us consider how ethnic stereotypes are formed and enhanced in modern cinematic discourse and explore the implications of these portrayals for cross-cultural understanding and relations.

In order to study foreigners' contemporary stereotypes about Russia, three films that have been released relatively recently were chosen: the third and fourth seasons of

the Duffer Brothers' series "Stranger Things", Luc Besson's "Anna", and Francis Lawrence's "Red Sparrow".

Stranger Things

An important similarity is that all three motion pictures depict the KGB. For example, in "Stranger Things", the KGB is involved in the breeding of monsters, and American teenagers are featured as fighters for the peaceful future of mankind. In the series, the Soviet Union is often called periphrastically the "enemy of the state" (Stranger Things, 2016), and this nomination is used not only by adults but also by children. In addition, the relationship between the superior and inferior is permeated with cruelty and ruthlessness. The prisoners in Kamchatka are called "cogs of the machine in the service of the great motherland" (Stranger Things, 2016). The series supports the myth that Russia is eternally cold and gloomy, as the main location is Kamchatka.

Anna

In "Anna," the Soviet Union and the CIA are set in contrast. The CIA's special department head is depicted as empathetic and emotionally driven. In contrast, the KGB officers are shown as ruthless and cunning, offering no forgiveness or second chances. The protagonist is immediately threatened with a choice to work for the Motherland or face death: "I'm taking her on probation. If it doesn't work out, I'll send her dead body in a sack" (Anna, 2019). By contrast, the CIA assures Anna of her safety and support, stating, "Now you are with us. We protect our own" (Anna, 2019). It is worth mentioning that non-verbal cues, such as elements of clothing, are also stereotypical, even though no explicit negative or positive connotations are discernible. These visual markers merely reflect foreign perceptions of Russian culture. For instance, in one scene, the protagonist is depicted wearing a fur hat and a fur coat of white color. At the beginning of the movie, her image is complemented by a blue headscarf covering her hair.

The director makes an attempt to adapt Russian experiences and visualize Russian cultural space. The movie incorporates traditional elements of Russian culture: matryoshka dolls and the Kremlin, with Moscow serving as the setting for the movie. The depiction of Anna's history is noteworthy: prior to her employment in the Foreign Intelligence Service, she experienced impoverished conditions, substance abuse, and physical abuse inflicted by a young criminal. Consequently, the film perpetuates the stereotypical view that life in the USSR is characterized by terror, destitution, and despair. Anna attains happiness only after departing from her homeland and achieving personal autonomy.

The Red Sparrow

In "The Red Sparrow" by Francis Lawrence, Ivan Egorov, working for foreign intelligence, sends his niece into a world of death, torture, and violence, driven by patriotism: "He is a patriot" (Red Sparrow, 2018). Russians are portrayed as unfeeling and prioritizing the end over means, and their tough decision cannot be mitigated even by blood ties. The colour red bears significance in the filmic text. For example, the colour red can be interpreted as a symbol of might and power, often attributed to the USSR. Furthermore, the film reinforces the stereotype regarding the beauty of Russian women, portraying it as an advantageous attribute that can be exploited for counterintelligence purposes. This depiction aligns with the broader cinematic trope that emphasizes physical attractiveness as a tool for espionage and manipulation.

Man on Fire

In American cinematography, one more ethnic group is stereotyped. Just as Russians are often depicted as cold and involved in espionage, Mexicans are also frequently represented as violent and corrupt.

The 2004 film "Man on Fire," directed by Tony Scott, portrays Mexican criminals as antagonists involved in kidnapping and organized crime, and Mexican law enforcement is featured as inefficient. One character describes a corrupt police accomplice: "From the anti-kidnapping unit, was apprehended. Sixty thousand dollars and a dead body in the trunk. He was let go" (Man on Fire, 2004). In contrast, the protagonist, an ex-CIA operative, despite being violent, is shown as heroic in avenging kidnappings. The motion picture frequently showcases gritty neighborhoods in Mexico City with impoverished residents. The film's depiction of Mexican characters and their culture presents a one-dimensional view of Mexico and its citizens. In contrast, the main character, an American national, is portrayed as a complex character. His American identity is emphasized to contrast with the Mexicans.

Conclusion

To summarize, several conclusions can be drawn regarding the contemporary stereotypes created in cinematic texts about Russia and Mexico. All four films depict Russian and Mexican law enforcement agencies, such as the KGB and Mexican police, perpetuating the image of these organizations as ruthless. Additionally, the portrayal of Kamchatka in "Stranger Things" and gritty neighborhoods in Mexico City in "Man on Fire" reinforces the stereotypes of Russia and Mexico as bleak and inhospitable places. Americans are often portrayed as complex, while Russian and Mexican characters are static and one-dimensional.

To conclude, it can be said that the research supports the hypothesis, and the multimodal elements of cinematic texts – their linguistic, pictorial, and colour modes – reinforce hetero stereotypes about Mexicans and Russians and conflict with the actual perceptions of the represented groups. The study opens avenues for further research which can be executed using the material of other films featuring stereotypes about various ethnic groups.

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Password Compromise Check Protocols Analysis and Comparison

Анализ и сравнение протоколов проверки компрометации паролей

ABSTRACT.

Modern cybersecurity protocols require information systems to verify user passwords against a blacklist before approval. Standard password policies, which often include criteria like minimum length and character diversity, fail to prevent the use of weak passwords such as "Admin" or "Pa\$\$w0rd". This study examines two methods of anonymous checking if a particular password is present in a database of leaked credentials. The first method uses the k-anonymity approach based on a hash function, employed by the Have I Been Pwned service, a platform that collects compromised password databases. The second method uses the Private Set Intersection algorithm and a commutative cipher, allowing the service provider to keep the compromised password database information confidential. This approach is employed by Google to check user password leaks in their products. The study implements a password compromise checking server supporting these protocols, comparing their characteristics, including operating speed, server resource consumption, the volume of data revealed to the server and client, and the complexity of client-side implementation.

Keywords: *Cybersecurity; Authentication; Password policies; Compromised password databases; Credential stuffing.*

Introduction

Password authentication has long been a widely used method for logging in. It is a simple and intuitive way to confirm a user's identity by requesting unique credentials known only to the genuine account holder. This method requires no specific technical tools and can be entirely implemented through software. However, it is susceptible to various attacks due to users often neglecting password security. Common issues include the use of easily guessable passwords, such as those containing personal information (for example, "anna2000"), simple sequences (for example, "abcdefghi"), and short passwords (for example, "mlka"). Additionally, users frequently reuse the same password across multiple

services, which poses a significant security risk as a single stolen password can compromise multiple accounts.

To enhance the security of information systems, specific measures need to be implemented. The commonly adopted password policies are outlined in the NIST Special Publication 800-63 version 1.0, published in 2004. These guidelines recommend measures such as enforcing password complexity (minimum length and character variety) and periodic password changes. Despite their widespread use, these policies are also vulnerable. Users often resort to predictable modifications to meet the requirements, such as capitalizing the first or the last letter of their preferred password and appending the number "one." Moreover, these policies do not address the issue of password reuse across different systems, where a single leaked password can jeopardize multiple accounts.

The updated version of the special publication, published in 2017, acknowledges the limitations of previous measures, deprecates them, and suggests a more modern and effective approach. This updated standard recommends checking passwords against lists of previously leaked passwords, dictionary words, repeated or consecutive characters (e.g., "bbbbbbbb", "2345bcde"), and context-specific terms such as service names or usernames. Although this mechanism is more complex to implement than traditional password policies, as it requires maintaining a comprehensive database of leaked passwords, it offers a higher level of security.

There is an open source project called Have I Been Pwned, whose authors collect a large database of compromised credentials from various sources (leaks, special services) and allow users to check their data anonymously and securely. This service provides a free API that allows you to check if your password is in the database of compromised passwords using a query. This feature is actively used in many applications and projects due to its convenience and being free of charge.

Problem statement

Although there exist a number of web services that check for password leaks, organizations and businesses often cannot rely on these services due to the following concerns about data privacy and dependency on external resources:

1. If the password-checking service is down, the infrastructure cannot work correctly.
2. The usage of an external password compromise checking service reveals some of the authentication statistics of the infrastructure (how often requests to the service are sent). This information may be used by an adversary in the process of estimating an organization's cybersecurity status.

The existing open-source deployment solutions also have significant drawbacks. All the solutions found provide very limited support for the Have I Been Pwned API, and some of them do not allow for real-time data updates. These projects are quite problematic to use in real-world implementations. Addressing this issue is crucial because checking for compromised passwords is a popular and recommended practice for account protection. Consequently, the decision was made to develop a local solution for password verification using a database of compromised passwords.

Objectives of the work

This work implements and compares two protocols for checking password compromise against a database of leaked values stored on a server, namely:

1. A protocol that uses the k-anonymity approach based on a hash function
2. A protocol using the Private Set Intersection algorithm with a commutative cipher.

The purpose of this study is to implement and compare the implementations of the two protocols of anonymous password checks.

Existing publications (Thomas, Pullman and others, 2019; Li, Pal and others, 2019) on this topic compare password compromise checking approaches and services, and propose other protocols. This paper implements and compares protocols using different technologies.

The hypothesis of this study is that the k-anonymity-based protocol is less resource-intensive on the server side and more straightforward to implement on the client side, than the PSI-based protocol.

The following steps were planned to achieve the given goal:

1. Server implementation with different protocols for anonymous password compromise checking
 - 1.1. Verification using the k-anonymity method (Ali, 2018) (the main method of the Have I Been Pwned project)
 - 1.2. Verification based on the Private Set Intersection algorithm (Google Security Blog, 2024)
2. Comparison of solutions characteristics based on different protocols
 - 2.1. Speed of operation (time required for the client to receive the result of a password compromise check)
 - 2.2. Server resource utilization (CPU load, memory size)
 - 2.3. Confidentiality (amount of data disclosed between client-side and server-side)
 - 2.4. Complexity of client part implementation (affects the complexity of adopting the approach in other products)

Methodology

Go programming language was chosen as the programming language for the server. There are several reasons for this decision.

First of all, it is important that this programming language has extensive possibilities for the implementation of such a server. They are:

1. The library for processing incoming HTTP requests is functional and simple. Implementation of similar functionality, for example, in C++, would be much more labor-intensive and would require the use of external libraries such as Boost.Asio.
2. Built-in concurrency support allows optimization of downloading the password database from the Have I Been Pwned service and splitting this time-consuming operation into several threads, thus reducing the time of initialization of the database via an external service.
3. A wide range of libraries with a simple enough connection allows for the implementation of all the options necessary for the server:
 - 3.1. Cobra library allows for the implementation of a command line interface with subcommand support.
 - 3.2. The progress bar library allows for the display of the current status of import and export of the compromised passwords database.
 - 3.3. PSI library (GitHub, 2024) allows for the implementation of a protocol for checking password compromise based on the Private Set Intersection protocol.
4. Automatic garbage collection (memory cleanup) helps to avoid errors related to memory leaks, thus increasing server reliability.

Go is a compilable language, which makes it much more productive than, for example, Python, which is also often used for service development.

This language is suitable for use inside containers, so a server based on it can be used in a microservice architecture.

Also, the Go programming language is widely used in the industry, making it easy to find reference materials and community answers to questions.

Using Go to implement a password compromise checking server allows for high performance, reliability, and scalability with relative ease of development and support. These factors make Go a perfect choice for this task.

The k-anonymity protocol works as follows:

1. The password is hashed using the SHA-1 (or NTLM) hash function and the first 5 characters (prefix) of the hash result are sent to the server.
2. The server responds with a list of suffixes of hashes that match the prefixes and are contained in the compromised passwords database.
3. The client then checks locally if the suffix of its password SHA-1 (or NTLM) hash matches any in the returned list.

This method makes it possible to verify passwords anonymously without revealing the complete password hash. Due to the even distribution of leaked password hashes across 1,048,576 possible prefixes (ranging from 00000 to FFFFF), each API response contains at most 1,000 entries per prefix. Furthermore, clients can download the entire database of SHA-1 hashes by querying all possible prefixes and retrieving the list of compromised suffixes for each prefix. The official .NET tool provided by the service developers supports this use of the API, indicating it is an intended functionality. Due to the fact that the original compromised password values may contain personal information that could be exploited by attackers, the Have I Been Pwned project does not reveal them.

The work also implements a mechanism akin to the one utilized by Google in its tools for verifying compromised passwords. The protocol functions as follows:

1. The client initiates the process by sending to the server a 20-bit prefix of either a SHA-1 or NTLM password hash, which is encrypted using a symmetric commutative elliptic curve cipher. This encryption key is uniquely generated by the client and remains confidential to them. The steps include:
 - 1.1. Extracting the first 20 bits of the password's hash:
hash(client_password)[:20]
 - 1.2. Encrypting the hash with the client's key:
client_encrypt(hash(client_password)).
2. The server, possessing its own unique secret key, responds by:
 - 2.1. Applying its key to the client's encrypted hash, resulting in double encryption: *encrypt_server(client_encrypt(hash(client_password)))*
 - 2.2. Encrypting both the hashed and leaked passwords that share the specified hash prefix after hashing them:
server_encrypt(hash(password)).
3. Due to the symmetric and commutative properties of the cipher, the client is able to decrypt the server-encrypted hash of their password using their key:
 - 3.1. *client_decrypt(server_encrypt(client_encrypt(hash(client_password))))*
 - 3.2. This equals *server_encrypt(hash(client_password))* because of the commutative property of the encryption.
 - 3.3. Finally, the client compares this decrypted value against the list of hashed and encrypted compromised passwords returned by the server to check for any matches, thereby identifying if their password has been compromised.

This protocol is implemented using the PSI library (GitHub, 2024) from OpenMined. Such a decision was made due to the fact that independent implementation of cryptography entails the risk of introducing vulnerabilities and significantly complicates further support of

the project. PSI library is an open-source library that implements the Private Set Intersection algorithm. Versions for different programming languages are available.

This library is actively supported, which is confirmed by the experience of interaction with the developer as part of the work on this graduate qualification work. Notably, during the development of the project, a bug was identified in the configuration files of the build for the library, in connection with which a request was registered on GitHub; the bug was promptly fixed within a week's time.

Experimental setup

Both quantitative and qualitative metrics are analyzed:

1. Quantitative metrics (basic indicators of server load that determine machine requirements)
 - 1.1. Time Consumption
 - 1.1.1. Execution time is measured by protocol steps using standard means of measuring time in Go and logging the results
 - 1.2. Memory consumption
 - 1.2.1. Measured using standard Go programming language library tools.
 - 1.3. CPU utilization in percentage
 - 1.3.1. Measured using the htop tool
 - 1.4. Request and response sizes that determine network load
 - 1.4.1. Measured using Go programming language standard library tools.
2. Qualitative comparison
 - 2.1. The complexity of the client-side implementation is compared
 - 2.2. Protocol anonymity characteristics are compared

The measurement was performed on a server with a 2-core processor, 4 GB of RAM, and Ubuntu 22.04 operating system. The Python programming language, Pandas and Matplotlib packages, Google Colab service were used to analyze the results.

Results and discussion

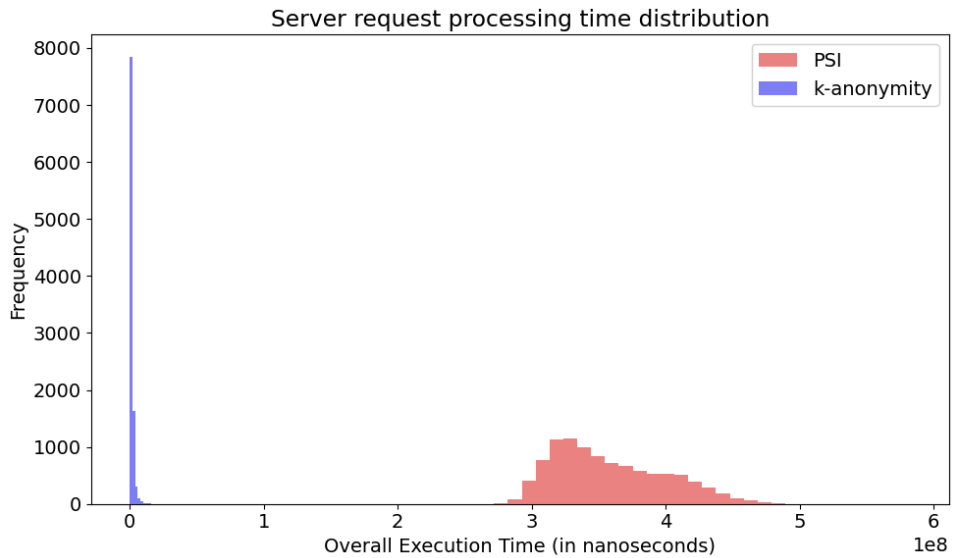
On the client side, verification using a protocol based on the Private Set Intersection algorithm takes about 40 ms on average, which is more than 100 times longer than for a protocol based on k-anonymity.

Table 1. Average password checking time on the client side (in nanoseconds)

mode	request preparation	server call	response processing	overall time
PSI	8697183.0384	358905347.7113	1322271.4717	368924802.2214
k-anonymity	5455.3712	2670244.6174	277440.6597	2953140.6483

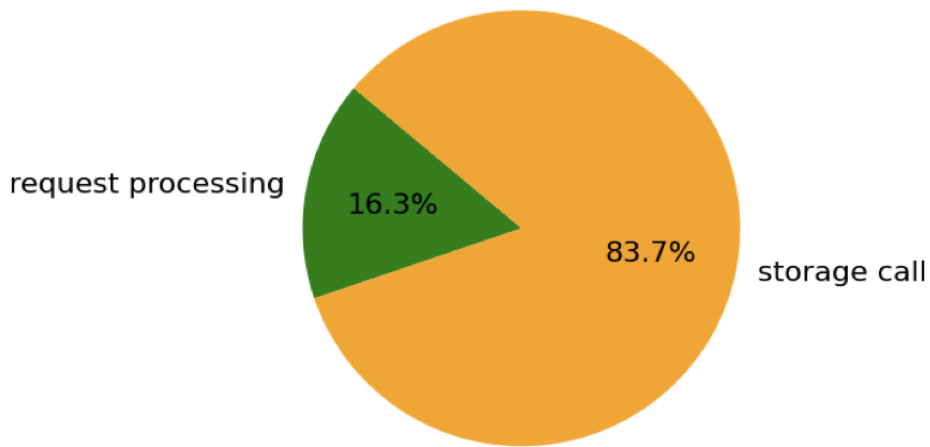
On the server, the ratio of password verification time is similar, as can be seen in the diagram below:

Figure 1. Time diagram of password verification requests processing on the server



A deeper look helps to understand the reason behind a significant difference in query processing time using different approaches. For a protocol using the k-anonymity approach, the storage access time takes more than 80% of the total request processing time. This is due to the fact that accessing the file system is a time-consuming operation.

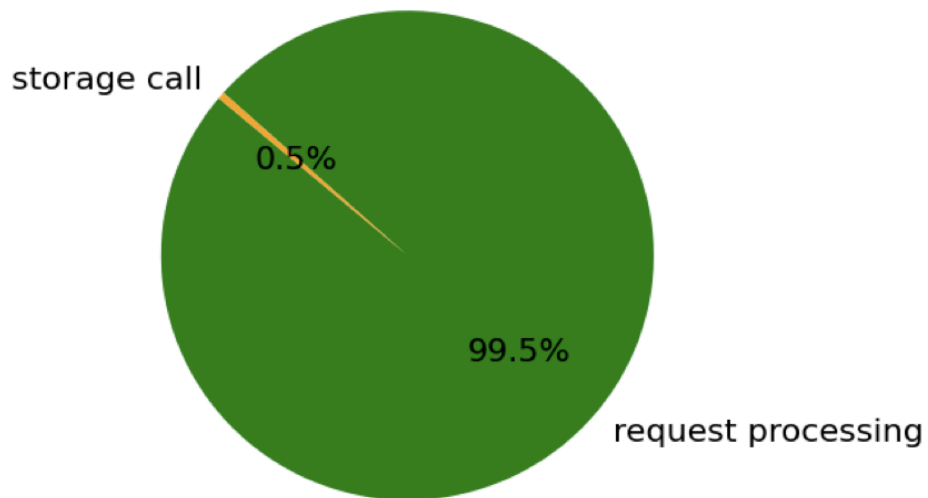
Figure 2. Diagram of time distribution by stages for k-anonymity
 Proportion of Stages for k-anonymity (Server)



The same access to the storage in a protocol using the Private Set Intersection algorithm takes less than one percent of the total request processing time. This is due to the fact that the Private Set Intersection algorithm uses advanced cryptography that requires lengthy computations.

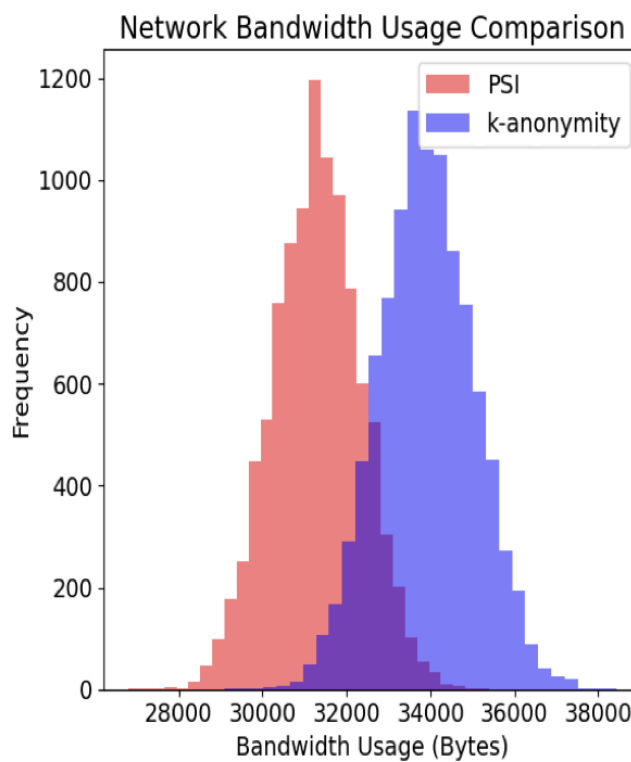
Figure 3. Diagram of time distribution by stages for PSI

Proportion of Stages for PSI (Server)



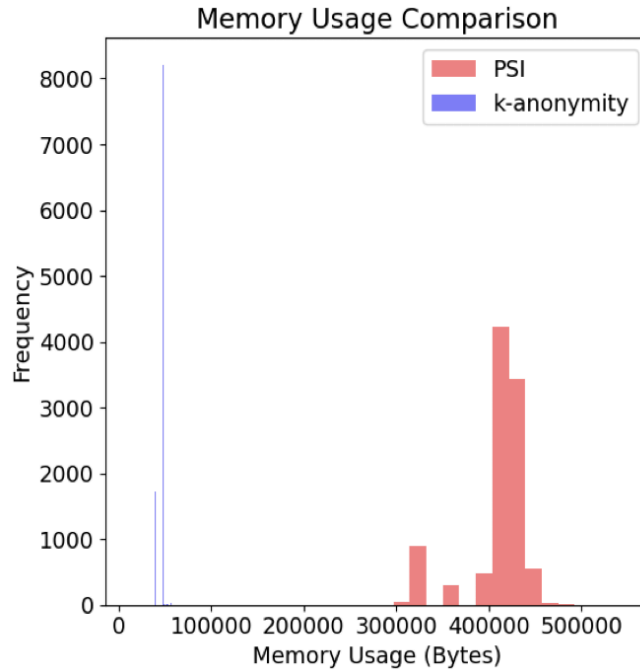
At the same time, the request and response sizes are slightly smaller for the protocol using Private Set Intersection than for the k-anonymity protocol.

Figure 4. Network load for the two protocols



However, the protocol using the Private Set Intersection algorithm requires 10 times more memory on the server than the protocol using the k-anonymity approach.

Figure 5. Memory utilization by protocols



As can be seen in the following table, the Private Set Intersection algorithm check takes on average about 20% of CPU time per second, while the k-anonymity-based check loads the CPU about 100 times less, which correlates with the time measurements presented above.

Table 2. CPU time utilization by protocols

mode	average CPU %
PSI	20.79
k-anonymity	0.21

Regarding the anonymity characteristics of the protocols, both protocols require the client to transmit a portion of the password hash. However, the protocol used by Google allows the server to hide the stored values, while the protocol based on k-anonymity requires the disclosure of a database of compromised password hashes.

Regarding the complexity of the client-side implementation, 16 lines of code were written to implement the client side of the k-anonymity-based protocol. At the same time, the implementation of the client for verification using the Private Set Intersection algorithm took 56 lines of code and required the use of an external library for cryptography.

Thus, the protocol using the Private Set Intersection algorithm is more difficult to implement in real solutions than the k-anonymity protocol for the following reasons:

1. The need to use an external library has the following consequences:
 - 1.1. It will be necessary to keep track of library updates, library patches, and code changes if necessary to maintain compatibility.
 - 1.2. The need to keep track of the legal risks associated with the licenses of the external component and its dependencies.
 - 1.3. Design limitations due to the fact that the external library is implemented for a limited number of programming languages.

2. Implementation of the client side is more complex due to the higher complexity of the protocol, as a protocol using the k-anonymous approach is significantly easier to understand.
3. Lack of alternative compatible public APIs.

Thus, the hypothesis is confirmed. The protocol based on the Private Set Intersection algorithm requires more resources to run and is more complex to implement. The resource usage difference is dramatic: the Private Set Intersection algorithm requires about 100 times more server time and 10 times more memory. This is a cost of being able to hide the base of compromised credentials data. Probably one of the reasons Google uses this protocol is that they thereby avoid reusing their database of compromised credentials. The compromised credentials database used by Google cannot be redeployed, as opposed to the Have I Been Pwned database. The Have I Been Pwned project, on the contrary, gives an official downloader of its database.

Given the performance advantages and ease of implementation, the k-anonymity-based protocol is more suitable in cases where there is no need to protect the leaked password hash database. This is the most common scenario, as the list published by the Have I Been Pwned project is commonly used.

Conclusion

In conclusion, this study has successfully implemented and compared two protocols for anonymous password compromise checking: the k-anonymity-based approach and the Private Set Intersection (PSI) algorithm. The k-anonymity protocol demonstrated advantages in terms of simplicity, lower resource consumption, and faster execution times, making it a practical choice for scenarios where the confidentiality of the compromised password hash database is not a primary concern. Conversely, the PSI algorithm, while providing enhanced security by concealing the database, requires more computational resources and complexity in implementation. These findings provide valuable insights for organizations seeking to enhance their password security measures, guiding them in selecting the most appropriate protocol based on their specific needs and resources.

While password-based login continues to be one of the main authentication methods, efforts should be made to ensure proper password management. Namely, password strength should be high during the installation phase, the password used should be stored in a secure location (e.g., encrypted in a password manager), and if compromised, the password should be immediately revoked and replaced. Mechanisms for anonymous password checking against lists are useful both at the initial stage of password setting to control that an uncompromised password is set and during the process of password storage and use in order to detect and promptly respond to compromised credentials.

It seems reasonable to promote the use of password compromise checking using the k-anonymity algorithm, as this approach is quite easy to implement, while allowing to significantly increase the security of login and password authentication. However, it is also important to develop more secure and anonymous password compromise checking protocols and increase their availability, as there are scenarios in which this increased anonymity would be useful.

Additionally, as cybersecurity threats keep changing, it is crucial for organizations to stay ahead by using strong password management and verification techniques. This means choosing the right protocol and adding strong security measures like multi-factor authentication, regular password checks, and teaching users good password practices. Future research can look into making these protocols more efficient and easier to use, as well as finding new ways to manage passwords securely. By doing this, organizations can better protect sensitive information and keep the trust of their users in the increasingly digital world.

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Trade and market relation in China-Russian intercultural communication
Торговля и рынок в межкультурной коммуникации Китая и России

ABSTRACT.

This paper examines trade and market relations in China-Russian intercultural communication. Nowadays, the economic situation resulted in a swift change of commercial priorities. This made the question of China-Russian commerce and cooperation more relevant.

The list of methods used in the paper entails primarily qualitative ones such as historical research, content analysis, the case study method, and etc. Incorporating examples and evidence from official reviews of meetings, articles of “RBC”, “TASS”, “The Russian Government”, “Kremlin”, “Reuters” and “The Economist” inferences were made. The study outlines a strong correlation between the change in the political discourse, influencing the world market reallocation, and the China-Russia economical collaboration extension trend. Since the economic China-Russia relationship is profound, the work focuses on relevant economic changes, specific features of pertinent economic projects and considers the future projects. The work is innovative because it is based on relevant resources and ponders on questions raised widespread nowadays. As far as economic cooperation between the two world leading oil-gas powers is inevitable, the discussion of the peculiarities of the economic communication will be substantial.

Keywords: *China-Russia economic relationship; economic relocation; intercultural communication; China-Russia cooperation; resources allocation.*

Introduction

Nowadays, the economic situation resulted in the swift change of commercial priorities. This made the question of China-Russian commerce and cooperation more relevant. Despite the fact that Russia and China share a long history that has included several various periods of ups and downs, deep cultural differences, the cooperation of two countries seems an inevitable step in their relationship. The aim of this work is to discuss how the change in political discourse has influenced world market in general and China-Russia economic partnership in particular. The work focuses on the fact that the collaboration is beneficial both for Russia and China economics. To that end, the work focuses on pertinent changes in the countries' economic relationship and applicable economic projects. Moreover, the work reviews the future projects and provides author's opinion on the question of future development of the countries. Due to the fact that work is based on relevant resources, contemplates the vital matters of modern world market, and ponders on motif of leading countries economic cooperation, it is confirmed to be innovative and relevant.

Since 2013, the leaders of China and Russia have met numerous times, which resulted in the establishment of profound dialogue between the countries. In 2019, the PRC and Russian leaders announced their intention to establish “a new kind of relationship between the world powers on the basis of mutual respect, peaceful coexistence and mutually beneficial cooperation” (The Kremlin, 2022), emphasizing that in the bilateral strategic cooperation “there are no ”forbidden“ areas of cooperation” (The Kremlin, 2022). Despite

the fact that this spreads on all partnership areas, this work initially focuses on the economic and financial cooperation.

Economic progress in the last years

In spite of all differences, China and Russia have always been great economic partners. China official representatives describe the current moment of the China-Russia cross-cultural cooperation as “historic high”, with the both countries being highly supportive - for each other’s economic development especially (Congressional Research Service, 2023). According to Andrei Belousov (The Russian Government, 2023) the trade between countries in 2023 has grown by a third. And it is planned that by 2030, the indicator will have reached \$300 billion.

Chinese shipments to Russia rose for almost a half in 2023, and soared almost 65% compared with 2021; imports from Russia rose 13% previous year in comparison with 2022 [Reuters, 2024]. Nearly fifty percent of all Russia's export oil and petroleum was shipped to China in 2023 (The Economist, 2024; Soldatkin, Astakhova, 2023). The overall financial performance of bilateral trade depends to a large extent on the fluctuations of global prices on oil, gas, coal, timber and other commodities that now amount to 70 percent of Russia's exports to China (Kortunov, 2024).

It is essential to mention fantastic results in the investment sphere - 80 in-process joint projects cost amounts 20 tril. roubles. (TASS, 2023). Also, nearly 39 billion roubles have been additionally provided for the Industrial Development Fund (The Russian Government, 2023).

So, it could be observed that in recent years China and Russia have experienced flourishing growth in their economic relationship. This happens because of the rising degree of bilateral trade between two countries. First of all, China and Russia compensate each other's downsides by supplying each other with essential missing merchandise (e.g. natural resources from the Russian side; commodities from the Chinese one). Secondly, both countries furnish each other with an essential sales market. Doing this, countries boost the economies by extra monetary infusions through duties, fees and surplus consumer’s expenses. Eventually, China and Russia both perform as major significant investors into the projects of exceptional vitality. Many of them are strategically important, almost all of them are already economically efficient. But all of these changes are based on the background of the acceleration of interest in a partner's culture and evolution of intercultural relationships from both sides.

The view on the cultures

Cultural forms influence business activity of interpersonal communication. In general, Chinese are conservative while Russians prefer to be straightforward in communication (Vasilyeva, Lebedeva, 2020). As T. Stefanenko says, Chinese respondents perceive Russia as “a country “rich” in natural resources and the military-industrial complex, but not people” (Stefanenko, 2009). S. Kononov (2016) states that Russians bear two views on China. They are primarily based on the appraisal of China's impact on Russia. These groups are: “alarmists”, those who indicate dangerous trends in the countries’ cross-cultural communication; “pragmatists”, those who form opposing images of cooperation, and are estimated to form calm mindfulness. The Chinese regard Russia’s straightforward behaviour as a rude performance. However, Russians regard China’s conservativeness and modesty as the label of fault or unsteadiness (Zhang, 2013).

It is generally agreed that any type of development is tightly interrelated with analogous, or at least comparable, business mentality and approaches. So, the question is rising - how were two such different cultures able to get this far in economic development? It may seem that in this case the countries’ cooperation is futile, if not impossible. In spite of

all of the presented differences in business mentality they are working in an efficient coalescence. In other words – Russia and China appear to be each other’s compliments.

Khunyue (2017) divides the antecedent causes of “communicative failures” into 3 main groups. The wrong choice of a language is the first group. It commonly includes a vague discursive strategy, as well as it could include an inaccurate or erroneous interpretation of it. Errors related to cultural traditions assigned to the second group. Eventually, the third group includes errors of the momentary context. These are peculiarities of the situation as a whole, the emotional state of the subjects in particular and their interconnection. Even if the countries do not undertake the drawbacks of fallacious language usage, they do face the other two failures. Many of Chinese cultural traditions are common and understandable for both Chinese and Russians: a vertical hierarchy based on the age gap, family orientation, a dualistic view on the world. Both countries even have similar approaches to reputation as one of the main characteristics of communication.

The study by Alexandre Ardichvili (2011), which is devoted to the examination of perception of corporate cultures of BRICs countries, provides us with factual evidence. The study outlined that business ethics around the globe is not universal. The results of the study imply that despite the fact that the perception of corporate culture in these two exact countries - China and Russia - contrast with other BRICs countries, they somehow correlate and complement each other.

Both China and Russia have almost the same levels of indicators on all proposed by Ardichvili measures of perception of corporate culture. It is suggested that the reason for this is the number of shared by countries sociocultural traits.

Projects

China-Russia interaction within multilateral international Institutions and gatherings, like the UN Security Council, G20, BRICS, SCO, APEC are highly important in the intercultural cooperation field. Especially BRICS and SCO in the last two years have boosted the dynamic of two countries’ integration.

The most well-known China-Russia project is gas line “The Power of Syberia”. Moreover, 80 projects total in 1,6 billions of RMB are being realised in the exact moment. According to the Shenyang Municipal Commerce Bureau, the previous year was marked by 122 Russia-invested enterprises being approved for establishment in Shenyang with a yearly revenue increase of 80 percent (PR Newswire, 2024). Recently, Yamal LNG has become a platform for China to actively participate in investing into Russian projects. CNPC purchased 20% of it, as well Silk Road Fund, which purchased only 10%. Also, 10% of the “Sibur” was obtained by Sinopec. It is estimated to be used for the realisation of several ambitious strategic projects in chemical and synthetic rubber industries (Shmeleva, 2023). Also, China diligently invested in wood processing. The wider list of projects you could observe on this slide.

Future projects.

There is a great variety of opportunities for both parties to ponder on the future cooperation. In 2023, there were already two face-to-face bilateral summits—President Xi Jinping came to Moscow in March, and President Vladimir Putin visited Beijing in October (Kortunov, 2024). It is worth mentioning that in 2024 both countries will celebrate the 75th anniversary of their diplomatic relations.

It is estimated that the Russian Government will provide more than 7.5 billion roubles for the IDF (Industrial Development Fund). Moreover, the Government has announced preferential programmes for those investors from both China and Russia which are eager to work in the sphere of business development of the Far East territories. These preferential programs include: the free port of Vladivostok; special incentives and benefits for the Kuril

Islands business; the Arctic zone subsidies (Kortunov, 2024; The Russian Government, 2023; Shmeleva, 2023).

Investors also are to gain exemptions - both tax and customs. A simplified procedure to receive land plots and infrastructure is also available for those investors, who plan to work in such industries as shipbuilding, natural resources (especially gas), clean energy projects and other programs, which would be proven beneficial both economically and socially (Kortunov, 2024; Shmeleva, 2023).

Conclusion

As it could be observed, the China-Russia relationship has great potential. Both countries have a solid ground for further future cooperation. It is observed that both China and Russia already have quite close linkages, which helps them to effectively work, overcome obstacles and develop. However, they should continue to progress in this sphere in order to raise the level of joint trust and work together on advancement of the quality-high flourishing of the countries' trade.

For the purpose of developing the potential trade between Russia and China better, an unreasonable use of trade barriers had better be reduced as much as possible. To this end, intercultural communication would be useful as an instrument of influence on the cooperation to affect interpersonal communication of business activities from different angles. In turn, development of business activities with business communication would find them as a base for trade and a great regulator, instead of rigid and strict barriers.

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L1 Transfer in Students' Use of Prepositions in Their Writing in English

Интерференция предлогов родного языка в письменной речи русскоговорящих учащихся

ABSTRACT.

The term L1 transfer denotes how one's native language impacts the use of a foreign language. Previous studies had examined the influence of learners' native language on the accurate use of prepositions in a foreign language. However, there is a notable gap in research specifically targeting the analysis of prepositional errors among Russian learners and the impact on English language proficiency, highlighting the need for more extensive and focused investigations in this area. The study aims to find out whether Russian students make errors in English prepositions due to the influence of their native tongue. The research was focused on the project proposals which were written by students at the HSE University

Perm. The data were processed with the corpus analysis toolkit AntConc. The study highlighted four types of errors associated with L1 negative influence on the use of prepositions: Substitution, Addition, Overgeneralization and Omission. It was found that the most common type of error among the Russian learners is Substitution.

Keywords: *language interference; error analysis; L1 transfer; prepositional interference; influence of the mother tongue.*

While learning a foreign language one tends to apply some rules from their first language onto the target language, even though the grammatical structures of the mother tongue and the target language may be different. This phenomenon is known as L1 transfer (James, 2007, p. 45, 95-118) and it refers to the influence of one's native language on the use of a foreign language, which can be either positive or negative and can take place at all levels of the language system. The current study focuses on the negative impact of Russian-as-an-L1 transfer on foreign language learning, namely on the use of prepositions when writing in English as the correct use of prepositions is seen as one of the biggest challenge for learners (Takahaski, 1969, p. 217-234). Due to negative interference, learners substitute English prepositions with the postposition existing in the same prepositional constructions in the Russian language.

The topic of the use of English prepositions by learners of English as a foreign language was covered by English-speaking researchers who relied on such languages as Georgian and Hindi (Gvarishvili, 2013, p. 1565-1573; Gamalinskaya, 2020, p. 453-456). However, there is a certain gap in the study of this phenomenon from the position of a native speaker of Russian. Therefore, the novelty of the study lies in the consideration of the interference of English prepositions in Russian-speaking students. The purpose of the study is to test the hypothesis that Russian students tend to make mistakes when they use prepositions in English due to the influence of their mother tongue on the perception of the foreign language. The aims of this research are to investigate how many errors students make in prepositions overall and how many of them can be explained by the influence of the mother tongue.

The possible limitations of the study can be considered to be the limited corpus and the level of English proficiency. The sample under consideration included final year students whose level of English was assessed at the B1-B2 level on the Common European Framework of Reference for Languages (CEFR). This suggests that the results may not be generalized to the people with other levels of English or to larger, more diverse populations.

The concept of interference has different interpretations depending on the discipline and context. Within linguistics, Jan Baudouin de Courtenay was one of the first to express the idea of the interrelation of languages with each other. In his terminology, interference is seen as a phenomenon related to the interactions of languages in the context of convergence (Де Куртенэ, И. А. Б. (1963). *Избранные труды по общему языкознанию*). After Jan Baudouin de Courtenay, "interference" was considered by a number of other linguists, but the term became widespread only in 1979 after the work of the American linguist Uriel Weinreich "Language Contacts", in which he defines interlingual interference as "cases of deviation from the norms of either language that occur in the speech of bilinguals as a result of the fact that they know more languages than one, i.e. due to language contact" (Weinreich, U. (1957). On the description of phonic interference. *Word*, 13(1), 1-11).

After W. Weinreich, most linguists adhered to his concept, arguing that interference is naturally negative and is an "obstacle" in the speech of a person who speaks two or more languages (Fromkin, V., Rodman, R., & Hyams, N. (2007). *An Introduction to Language: Eight Edition*. United States of America; Вахромеева, Г. Э. (2014). *Эволюция взглядов на проблему языковой интерференции. Полилингвальное образование как основа*

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The study is based on the analysis of the Perm Corpus of Learner Academic Projects, which comprises project proposals written in English in the period from 2015 to 2020 by students of the National Research University Higher School of Economics - Perm. This corpus was compiled by the researchers of the Learner Corpora Laboratory at the HSE University and consists of texts in 6 different disciplines. The average length of the text is 2,025 words. The size of the corpus is given in Table 1.

Table 1. The corpus

Disciplines	Number of texts	Number of words
Computer Science	59	103888
Juridical science	77	169174
Political Science	29	52726
Management	58	123259
Economics	68	142182
History	43	85072
In total	334	676301

The study was conducted with the corpus analysis toolkit AntConc 4.2.1 (Anthony, 2014) and a multi-language segmenter and Part-Of-Speech tagger TagAnt 2.0.5 (Anthony, 2022).

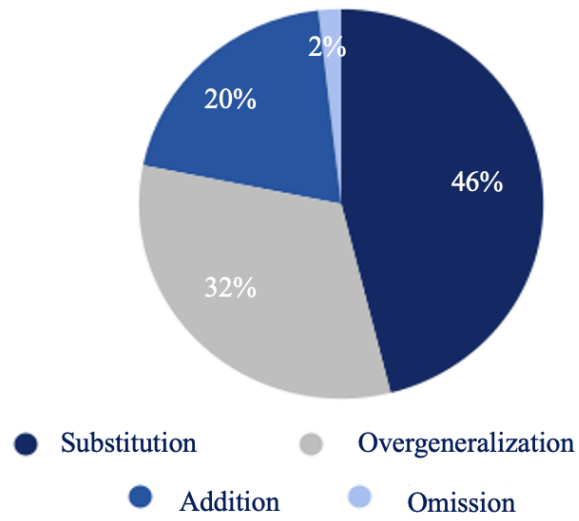
Towards the research method, frequency analysis was used to examine the data, where the total number of cases in preposition interference was identified. The most important step was the processing of the results, where each example was reviewed manually. Thanks to the qualitative method, it was possible to determine more accurately whether there is an error in the use of English prepositions due to the negative influence of the mother tongue.

The analysis of the data showed that Russian students used prepositions 121472 times. However, the number of errors in the use of prepositions was 165. After the errors were identified, a qualitative analysis of the examples was conducted. As a result, it was revealed that all the errors found were demonstrating the negative transfer of the preposition usage patterns of the Russian language to English. Moreover, the study highlighted four types of errors associated with L1 negative influence on the use of prepositions: Substitution, Addition, Overgeneralization and Omission. This categorization was proposed by Professor Zeinab Gvarishvili, which divided all errors related to the negative influence of the first language on the use of prepositions into four types (Gvarishvili, 2013, p. 1565-1573). All examples can be found in Table 2.

The results also show a significant difference in the frequency of occurrence of the

error types: substitution errors occur much more frequently in both corpora than addition or omission errors (Figure 1):

Figure 1. Frequency of errors



Type of error	Deviations among Russian students	English Prepositional Expression	Number of errors
Substitution	In the end of	At the end of	22
	In the Internet	On the Internet	20
	To have problems in	To have problems with	13
	In the same time	At the same time	5
	On the question	To the question	4
	To divide on	To divide into	4
	On Russian	In Russian	2
	To arrive to	To arrive in	1
	To agree to it	To agree with it	1
	To feed with	To feed on	1
	In the age of	At the age of	1
	Different than	Different from	1
	On the first place	In the first place	1
Overgeneralization	Solution of	Solution for	38
	Reason of	Reason for	10
	To study in the university	To study at the university	3
	In the moment	At the moment	2
Addition	To influence on	To influence	29
	To discuss about	To discuss	2

	To enter to	To enter	2
Omission	At the end smth	At the end of smth	1
	Interested smth	Interested in smth	1
	To suffer smth	To suffer from smth	1

The most frequent type of errors - substitution. In the written corpus, this type of errors accounted for 46% of all presented errors (Figures 1).

It is worth noting that one of the most frequent errors in the category of preposition substitution was the incorrect use of the preposition "in" in the phrase "in the Internet". Making an analogy with Russian, where the phrase "в Интернетe" is used, students transfer this knowledge to English, making the mistake:

(1) "The researchers found in the internet...".

The following errors were also found: "on Russian, on the question, on the first/third place, in the same time" (Table 2).

Table 2. Classification of errors

Moreover, it is significant to note such a group of errors as errors in prepositions of phrasal verbs. Phrasal verbs in English differ significantly from the coordination of these verbs in Russian. Therefore, prepositions in English phrasal verbs are very often interpreted literally from Russian, which provokes errors in the use of prepositions. Thus, instead of the preposition "on", Russian-speaking students, by similarity with their native language, used the equivalent of the Russian preposition "from" in English: "to depend of":

(2) "...the success of creative agency depends on good of good strategy so like that".

Overgeneralization was the second most frequent category in which students made errors (Table 2). This type of errors is the least evident, because it may utilize the preposition in general in certain collocations, but only in a particular context.

For example, the most typical errors on overgeneralization were two phrases: a solution of / a reason of. Such expressions are correct only in the section of chemical or mathematical research. However, in the examples presented below, the reason belongs to a specific problem:

(3) "... as a reason of lay-off the amount of loans provided by banks to legal entities".

Thus, the correct variant would be "a solution to the problem".

Another notable error arises with the prepositions "in, at" when specifying a location. In Russian, it is accepted to use the preposition "in": "быть в школе/в университете". In English, a word-by-word translation of the preposition is possible, but only if the speaker is inside the building they are talking about at the moment of speech. If it is necessary to convey the meaning that a person usually goes to school, then "to" should be used and utilization of the preposition "in" would be an error of overgeneralization. The following error was observed in the corpus:

(4) "The authors test the possibility of predicting the success of learning in the university based on the results of the exam".

The subsequent type of error in the use of prepositions is addition. Such errors comprised 20% of the total number of errors (Table 2). The most typical example of this error in the written corpus was the phrase: "to influence on", in which many people made mistakes due to negative interference of their native language:

(5) "This will allow me to develop a conceptual model that describes how some type of corporate news influences on the company value in different conditions".

Students, following the literal interpretation of the Russian expression "влиять на", added the unnecessary preposition "on" to the English phrase. It is also possible to note such errors as: "to discuss about, to enter to" (Table 2).

The last type of errors related to the negative influence of the native language refers to the incorrect omission of a preposition. Here the situation is the opposite of the addition error, as the student, on the contrary, avoids using the preposition that is needed in the English language because they do not employ it in their native language. This type was represented in three errors "at the end something, interested something, to suffer something" (Table 2).

To summarize, on the basis of the analysis of the written corpus of Russian-speaking students, as well as on the review of the acquired errors in prepositions, we can conclude that the hypothesis was fully confirmed. The main source of errors in prepositions is actually negative interference of the native language. Moreover, the study identified all the types of errors that Professor Zeinab Gvarishvili discovered, which include: Substitution, Addition, Overgeneralization and Omission. It was also found that the most frequent type of errors in the use of prepositions is Substitution. This can be explained by the tremendous difference in the structures of Russian and English prepositions.

The prospects of the study are to consider a more extensive sample that includes all levels of English proficiency. By this approach, it would be feasible to show in more detail whether the number of interference-related preposition errors depends on the level of English.

Furthermore, it would be valuable to examine the differences in interference errors between speakers of different languages, and whether native language interference occurs when learning a second or more foreign languages.

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The Influence of Nicotine on Human Brain
Влияние никотина на мозг человека

ABSTRACT.

This literature review explores the mechanisms by which nicotine affects the brain, aiming to shed light on the addictive nature of smoking and its impact on human health. Despite widespread awareness of the harmful consequences of smoking, including cancer and reproductive issues, many individuals continue to smoke, often seeking relaxation or simply out of curiosity. This study, drawing on existing research, reveals how nicotine interacts with the brain's reward system, triggering the release of dopamine and creating a sense of pleasure and reinforcement. This process contributes to the development of addiction, making it difficult for smokers to quit. Furthermore, the review highlights the role of nicotine in influencing cognitive function, mood, and behavior, providing a deeper understanding of how it impacts the lives of smokers. The ultimate goal is to create an accessible brochure summarizing these findings, empowering individuals with knowledge about the neurobiological underpinnings of nicotine addiction and fostering informed decisions regarding smoking cessation.

Keywords: *nicotine; smoking; brain; withdrawal symptoms; acute tolerance.*

Smoking is a great danger to humans. It's not just about health. There are a huge number of other important issues involving various aspects of human life caused by smoking. Speaking of health, due to the widespread public awareness of the dangers of smoking in modern times, even children are aware that smoking can lead to cancer. Despite this life-threatening risk, both from tobacco and electronic cigarettes, smokers continue to smoke. Many people voluntarily take risks, and all thanks to the seemingly extraordinarily working effects that smoking has on a person. It becomes easier for people to work: they become more attentive, stress-resistant and remember information better. All these effects are due to the substance contained in cigarettes alone - it is the reason why most people smoke. It's nicotine. Nicotine is the primary cause of cigarette addiction. It is nicotine that provides the positive effects of smoking, enticing people with its appealing effects and causing them to return to cigarettes over and over. However, these are common phrases that are often used in programs aimed at reducing smoking and promoting a healthier lifestyle. Such initiatives and events encourage people to think and help many people to break free

from harmful habits and prevent others from starting to smoke. Nevertheless, for some individuals, these phrases may seem vague and lack credibility. People are increasingly seeking to gain a deeper understanding of a particular issue, and until they fully comprehend what is wrong with a specific product, they may continue to use it. Therefore, this article may be beneficial to readers by explaining the fundamental principles of brain processes triggered by nicotine.

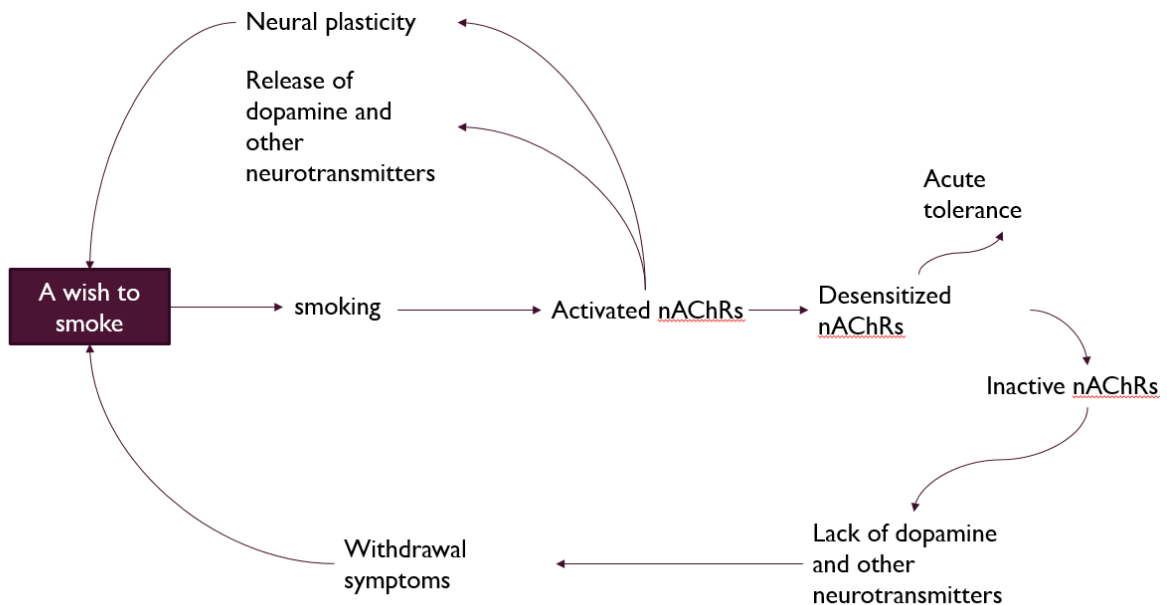
A small survey was conducted among individuals of various genders and age groups. The findings indicated that some respondents do not believe that nicotine actually causes addiction or has any significant effects. This suggests a lack of awareness among some individuals regarding the potential implications of nicotine use, underscoring the significance of the article's message.

The aim of this report is to describe some of the processes occurring in the brain and to create a brochure which briefly explains the effects of nicotine on the human brain in a way that is accessible to everyone, including those without a biological background. To this end, at the outset, a general overview of the overall picture will be provided in simple terms, and then for those who wish to understand further, some processes will be described in greater detail.

General description

Neurons (brain cells) communicate with each other and make our body function. No process takes place without the participation of neurons. Neurons control our body through receptors with the help of neurotransmitters that neurons secrete. From neuron to neuron, the neurotransmitter is sent in a special "shell" - vesicle. The receptor is a "door" from one h to another. To open it, you need a neurotransmitter key. One of the keys is called acetylcholine. One of the doors that opens is called nicotine acetylcholine receptor. Nicotine, entering our body in the process of smoking or inhaling cigarette smoke, "deceives the door." Nicotine is a more suitable key to this door, and it opens it instead of acetylcholine. Dopamine is released, and we are happy. Normally, dopamine is released in the body for a short period. Other mediators control dopamine production. Nicotine not only promotes the production of dopamine, but also disrupts control functions. Because of this, the body becomes addicted, it wants to receive a reward, while the sensitivity threshold of the receptors decreases, many stop working. And for them to work, you need large doses of nicotine. Due to stress, the "CRF-CRF1" system is activated, and the body requires a new dose of nicotine to relieve stress. The connection is lost – the body begins to work with a malfunction.

Figure 1. "Smoker cycle".



When a person first wants to smoke a cigarette, he or she smokes, activating nAChRs (nicotinic acetylcholine receptors), which leads to positive effects such as happiness and memory increase. On the other hand, the receptors lose their ability to be activated for a while, the lack of dopamine and other neurotransmitters appear, which leads to withdrawal symptoms (Benowitz, 2010).

Detailed description

The nicotine acetylcholine receptor consists of 5 subunits. Among them there may be β , γ , δ , α subunits.

It is essential to investigate the function of receptors and their effects, as external manifestations of certain symptoms may depend on them. Different receptor subtypes are responsible for distinct outcomes in the brain, and various combinations of these subunits can also produce specific effects. For instance, it has been found that the $\alpha 4$ subunit of the nicotinic acetylcholine receptor plays a significant role in determining nicotine sensitivity (Tapper, McKinney, et al., 2004). There are instances where specific combinations of receptor subunits produce unique effects. The $\alpha 5$ subunit, when combined with $\alpha 4$ and $\beta 2$, increases calcium conductance by seven-fold. Variations in the gene encoding the $\alpha 5$ subunit affect the sensitivity of human cells to nicotine in culture (Bierut, Stitzel, Wang, et al., 2008; Tapia, Kuryatov, Lindstrom, 2007). Receptors composed solely of $\alpha 7$ are crucial for learning and other vital processes (Benowitz, 2010). However, in order to interact with the receptor, it is necessary to penetrate directly into the brain, which is not in itself an easy task.

Overcoming the blood–brain barrier, a major protective barrier of the central nervous system is a significant challenge for pharmacologists. This is because many substances, particularly drugs, are unable to penetrate this barrier. In contrast, nicotine can easily cross the blood–brain barrier and enter the brain. Once there, it binds with the nicotinic acetylcholine receptor (nAChR), which is named after its affinity for nicotine. Stimulation of this receptor leads to the release of other numerous neurotransmitters (Carpenter, Wayne, Connolly, 2007; Wonnacott, 1997). Nicotine's interaction with nAChR contributes to this process.

Among the numerous neurotransmitters released, dopamine is one of the most significant neurotransmitters. It has been referred to as the "neurotransmitter of happiness" (Loonen, Ivanova, 2022) by many people, but the phrase "dopamine addiction" has also gained popularity. This phrase is justified, as dopamine plays a crucial role in the development of various addictions, including those related to gadgets and even certain types of narcotics. In addition to providing pleasant feelings in the moment, dopamine helps the brain remember why and what caused these feelings, contributing to the development of addiction. This is because dopamine not only produces pleasure but also helps the brain associate specific activities or substances with positive emotions, leading to a desire to repeat them.

Thanks to nicotine, dopamine is released in the mesolimbic region, striatum and frontal cortex. The active release of dopamine in the mesolimbic system leads to the aforementioned effects: addiction, enhancement, and sensitization. Due to its secretion in the striatum and frontal cortex, individuals learn more easily and concentrate on material (Makarov, Filonov, Izmozherova, Bahtin). This causes us to feel pleasure, our brain thus "rewards" us for nicotine, hence pleasant emotions (Dani, De Biasi, 2001; Nestler, 2005).

In addition to dopamine itself, the release of glutamate increases, which, in turn, also contributes to the production of dopamine. GABA (gamma-aminobutyric acid) is also produced, which, on the contrary, blocks the production of dopamine (Idem, 2002; Mansvelder, McGehee, 2000).

If nicotine is bound to the receptor for a long time, then the receptor loses sensitivity and ceases to have an effect. This happens to many receptors during the smoking process, but some receptors continue to work. This leads to the fact that GABA stops being released and no longer blocks the production of dopamine, and glutamate continues to be released, enhancing it (Benowitz, 2010).

When a person smokes repeatedly, many receptors desensitize in the brain, that is, they lose sensitivity (Govind, Vezina, Green, 2009; Wang, Sun, 2005). It is assumed that this contributes to the formation of nicotine dependence. A person with receptors that have reduced sensitivity cannot feel comfortable, and the body experiences stress without smoking. In response to stress, the CRF–CRF1 system is activated. In rats, activation of this system is worrisome (George, Ghosland, Azar, et al., 2007). In addition to avoiding withdrawal symptoms and uncomfortable well-being, a system is activated that exacerbates the negative effects associated with nicotine addiction.

In the brochure PANTONE 13-1023 Peach Fuzz was used as the main color, because as it is the color of 2024, it is perceived easily and attracts the attention of the audience.

Figure 2. Brochure style.



Conclusion

Cigarette smoking is a dangerous habit due to various factors. Some substances found in tobacco products can be harmful, while others may be present in electronic cigarettes. However, the most significant factor driving people to smoke is nicotine. Nicotine has a negative impact on human health and can lead to addiction. Before making a decision to smoke, it is important to understand the potential consequences and reasons behind this choice. Smoking can lead to a range of health issues and difficulties in various aspects of life. It is easier to prevent nicotine addiction than to deal with its negative effects later. Nicotine can initially provide pleasant sensations, which can lure people into becoming addicted. Once addiction develops, it can have a significant impact on physical and emotional well-being, making it difficult for individuals to quit smoking. Addiction can lead to difficulties in various areas of life, such as social interactions, work performance, and overall quality of life. Therefore, it is crucial for individuals to make informed decisions about their smoking habits and consider the potential risks and benefits before starting or continuing to smoke.

Therefore, it is essential to promote a healthy lifestyle and educate everyone about the potential consequences and causes of various behaviors. This article does not condemn anyone for their choices, but rather encourages them to make informed decisions after receiving important information. It is unfair to judge someone for their choice, especially if they believe that nicotine does not harm them. Instead, we should provide them with accurate information so they can make an informed decision.

To attract the attention of our audience, we have chosen the PANTONE color for the year 2024. We will distribute our brochure on social media to help people make better choices with reliable information. Everyone has the right to make healthy choices, so let's help them do so.

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Development of Educational Materials on Intercultural Cooperation in the Oil and Gas Sector (on the Example of Russia and China)

Разработка пособия по межкультурному сотрудничеству в нефтегазовой сфере (на примере России и Китая)

ABSTRACT.

In the last two decades, the strategic partnership between Russia and China has reached unprecedentedly high levels, particularly in the energy sector. Chinese imports of

energy supplies from the Russian Federation are steadily increasing, and joint projects are being implemented in investment and infrastructure. The experts required for successful cooperation should be knowledgeable in Chinese business practices, industry-specific language, and intercultural communication. This paper aims to outline the results of a project on creating linguistic educational materials on intercultural cooperation between Russia and China in the oil and gas sphere, with a particular focus on international commercial contracts in the sector. A survey is applied to confirm the relevance of the materials and gather quantitative data on the background knowledge of the target audience. Based on the results of the survey and literature analysis, a content plan is created, with subsequent selection and adaptation of authentic texts and development of linguistic tasks for each of the texts. The materials contain three chapters, with texts and lexis pertaining to the oil and gas sphere, contacts, and extralinguistic factors of drafting and negotiating contracts. These materials can be further used in the process of education by university students majoring in linguistics, oriental studies, marketing, and other related fields, as well as Russian energy sector companies interested in establishing successful relations with their Chinese colleagues.

Keywords: *energy sector, oil and gas, intercultural cooperation, business communication, international commercial contracts, Chinese, educational materials*

In 2024, as part of his election campaign, Vladimir Putin proclaimed that Russian-Chinese relations would continue to deepen and develop to benefit the peoples of both countries (Xinhua, 2024). As it is, more than 20 years after the signing of the Treaty of Good-Neighborliness and Friendly Cooperation between the Russian Federation and the People's Republic of China, strategic partnership and cooperation between the two countries have reached unprecedented levels (Xinhua, 2023).

According to Lu Nanquan, at the present moment, the energy sector can be considered the most vital area of Sino-Russian cooperation (Lu, 2021). The volume of Chinese import of energy supplies from Russia continues to increase, with Russia replacing Saudi Arabia as the primary crude oil supplier in 2023 (CNN, 2024). However, Chinese-Russian cooperation in the oil and gas sector is not limited to trade. The countries are developing and implementing various joint projects concerning equipment, processing, and transportation of oil and gas (Anadolu Agency, 2022). The ongoing advancement of bilateral cooperation between Russia and China necessitates the emergence of experts, knowledgeable in the intricacies of not just intercultural communication, but also in Chinese business practices and language in the context of the oil and gas industry. Nevertheless, as Chinese-Russian relations advance in the energy sector, there still appears to be a scarcity of educational resources focusing on the field of oil and gas or offering insights into contracts within that sector.

This article aims to outline the results of a project on creating linguistic educational materials on intercultural cooperation between Russia and China in the oil and gas sphere, with a specific focus on contacts in the sector.

As the created educational materials exist, at least partially, within the realm of cooperation between different cultures, it seemed prudent to elaborate on the relevant theories of intercultural communication. Apart from Edward T. Hall's high-low context theory of cultures (Hall, 1976), and Geert Hofstede's theory of cultural dimensions (Hofstede, 1980), this work was largely influenced by Richard Lewis's culture model (Lewis, 2006). National cultures can have significant differences both in terms of worldview and thinking patterns and in terms of traditions, rules of behavior and expectations towards other people in different situations. These discrepancies have the potential to create various complications and misunderstandings during interactions between representatives of

different cultures. Such situations are especially undesirable in the field of business communication, as any kind of confusion or misinterpretation may lead to financial losses or even complete failure of a business venture.

Additionally, the distinguishing features of the style of official documents have been studied, both in Russian and Chinese (Golub, 2024, Wang, 2021). Some peculiarities of the style seemed to transcend the borders of one language and appeared in the guidelines for drafting legal documents in both Russian and Chinese. Such are the requirements of precision, avoidance of duality of meaning, frequent use of linguistic clichés and terms relating to the legal sphere and the relevant area of business (Makarova, 2019, Wang, 2021). Nevertheless, some features were found to be unique to one or the other language. Such is, for instance, the strict prohibition on using dialect vocabulary in Russian, as opposed to a more lax approach in Chinese. Within the framework of that line of study, contract as a linguistic unit of business communication was thoroughly examined as well.

Cross-cultural competence appears to be an indispensable part of any type of communication. Along with comprehensive understanding and proper use of the industry-specific language, it is of paramount importance for facilitating international business cooperation in any field (Wiseman, 2002). A wide variety of educational resources, such as textbooks, guides, and manuals, have been created in order to provide support for foreign businessmen in their endeavor to successfully conduct business with their Chinese colleagues. The existing materials dealing with business communication can be divided into four categories. The first one, which represents the majority of business Chinese textbooks, contains lexical items on the general and most common topics that might arise in the course of business interactions. The second category encompasses materials providing information on Chinese business culture. The third category is represented by textbooks pertaining to a specific area of business, such as, for instance, finance or marketing. The fourth and last category of materials deals with a specific aspect of business, such as negotiations or business correspondence.

In order to establish the background knowledge of the target audience and verify the hypothesized necessity for the educational materials, the online survey method was employed. The survey was created using Google Forms. Purposive sampling was used in order to select the participants for the survey. It was determined that for the materials on an advanced topic such as oil and gas to be most useful, students must possess a minimum Chinese language proficiency of HSK (Hanyu Shuiping Kaoshi – eng. *Chinese Proficiency Test*) Level III. Additionally, as the materials are to be of introductory nature, the primary target audience is expected to have had no special education in law or energy industry. Therefore, the survey form was distributed among third- and fourth-year students of the Higher School of Economics Foreign Languages and International Communication Bachelor's program majoring in Mandarin Chinese, as the curriculum of this program aligns with the knowledge requirements for the target audience of the educational materials.

The survey consisted of 10 questions. Most of the questions were created using the five-point Likert scale (source). In some questions, respondents needed to assess their level of awareness and knowledge about a particular topic on a scale from 1 to 5, where 1 is COMPLETELY UNFAMILIAR, 2 is UNFAMILIAR, 3 is SOMEWHAT FAMILIAR, 4 is FAMILIAR, 5 - VERY FAMILIAR. There were also questions where it was necessary to assess the level of confidence in one's ability to understand international commercial contracts in Russian and Chinese on a scale from 1 to 5, where 1 is NOT AT ALL SURE (-A), 2 is NOT SURE (-A), 3 is MODERATELY CONFIDENT (-A), 4 - FAIRLY CONFIDENT, 5 - VERY CONFIDENT. In addition, respondents were asked to indicate their level of Chinese language proficiency, as well as whether they were considering a career in the foreign economic activity sphere (FEA), oil and gas, and whether they were

interested in educational materials on contracts and intercultural cooperation between Russia and China in the oil and gas sector.

In total, 24 people took part in the survey. More than 85% of respondents indicated that their Chinese proficiency is equivalent to HSK level III and above, with 41.7% of them at HSK level IV and HSK level V. The majority of respondents (66.7%) noted that they are not familiar with the oil and gas sector at all. Another 33.3% possess only a basic understanding of the industry. In terms of knowledge of the topic of intercultural communication, more than 80% of respondents indicated that they have little or average knowledge of intercultural communication theories. Only 16.6% and 12.5% have a good or very good understanding of the specifics of intercultural communication between Russia and China and the specifics of business communication with China, respectively. 23.3% of respondents are confident in their understanding of international commercial contracts in the Russian language (ranging from MODERATELY CONFIDENT to VERY CONFIDENT). At the same time, only 4.2% of respondents possess even an average confidence in their ability to understand international commercial contracts in the Chinese language, while 95.8% expressed that they were NOT AT ALL SURE or NOT SURE. 75% of respondents are potentially considering a career in FEA. 62.5% of the respondents indicated that they consider pursuing a career related to the interaction between Russia and China in the oil and gas sector. More than 90% of respondents demonstrated interest in educational materials on contracts and intercultural cooperation between Russia and China in the field of oil and gas. As expected, the representatives of the target audience, for the most part, are unfamiliar with the field of oil and gas, moderately familiar with the field of intercultural communication as well as with the specifics of business communication with China, and do not possess knowledge regarding international commercial contracts in the Chinese language. Thus, with that hypothesis proven, the creation of the educational materials proceeded as initially planned. The content of the educational materials was compiled as follows:

1. Introduction to the field of oil and gas
2. International commercial contracts in the field of oil and gas
 - i. Definition
 - ii. Structure
 - iii. Supply agreement
3. Extralinguistic factors of drafting contracts

Each chapter contains several subchapters, pertaining to a narrower topic within the chapter. For every subchapter, authentic textual materials were selected and adapted in accordance with the nature of the educational materials and the knowledge levels of the target audience. Relevant lexical items were extracted from each text and compiled into a table, containing the original word, its pinyin transcription and translation into Russian. For each text tasks were created, the majority of which were aimed at vocabulary practice, consolidation, and appropriate application, with some tasks on text comprehension. The task pool was as follows, with each text accompanied by various combinations of these tasks, depending on the nature of the text and the vocabulary present:

1. 练习阅读下列词语 **Practice reading the following words**
2. 填空, 组成词语 **Fill in the gaps with the missing characters to make polysyllabic words or phrases**
3. 将下列俄文词语译成汉语 **Translate the following words into Chinese**
4. 用所给的词语填空 **Fill in the gaps with the words below**

5. 改错句 **Correct the incorrect sentences**
6. 完成下列句子 **Complete the sentences with appropriate words**
7. 把下列词语整理成句子 **Put the words in the correct order to make sentences**
8. 加上缺少的词语并把下列词语整理成句子 **Add the missing words and make sentences using the words below**
9. 将下列俄文句子译成汉语 **Translate the following sentences into Chinese**
10. 自测题 **Self-check questions**

As part of further work on the educational materials, the following options may be proposed:

1. Increasing the complexity of the materials. It appears possible to create a version of the materials where the chapter on the oil and gas sector is aimed at professionals in the sphere. Such a version could potentially include a more detailed description of the processes relating to the oil field development, processing of oil and gas, as well as supply terminology related to infrastructure facilities and equipment. This development vector can be implemented in collaboration with experts in the field of oil and gas.

2. Expanding the scope of the educational materials. One of the ways to expand the educational materials is to broaden the chapter on the oil and gas sphere, so that it covers the energy sector as a whole with discussion of various energy resources. Another way of expanding the scope of the educational materials is to elaborate further on the topic of international commercial contracts. Due to the fact that the educational materials were developed for people who have not had any education in law, it was decided to provide a break-down of the most common type of international contract in the oil and gas industry – a supply contract. It appears possible to expand the chapter on contracts by adding and analyzing other types of contracts frequently used in the sphere (such as, for instance, joint venture agreement, transportation agreement, investment contract). Another possible way to expand the scope of the educational materials is to include more theories of intercultural communication relevant within the framework of Russian-Chinese interaction. It also appears feasible to supplement the chapter on extralinguistic factors by providing information on business etiquette, cultural traditions, holidays and other factors that influence the quality and success of intercultural business communication.

3. Providing grammatical reference. Within the framework of the created educational materials, the main focus was on the formation of lexical skills. As part of further work on the educational materials, it appears possible to add a grammar reference, as well as tasks aimed at the development of grammatical skills.

4. Transferring the materials to an online format. It seems feasible to transfer the educational materials to an online format using an interactive platform such as Edvibe. Additionally, it may be proposed to develop an online course based on these educational materials.

All in all, the following was accomplished as part of the process of creating the linguistic educational materials on intercultural cooperation of Russia and China in the oil and gas sector. The basic features of the oil and gas sector, the sphere of international contracts and intercultural business communication were studied. The average level of knowledge of the target audience, pertaining to the topics touched upon in the materials, was

established. Based on the collected data, authentic textual materials were selected and adapted for the purposes of the educational materials. Word lists with transcription and translation of the lexical items were compiled, and linguistic tasks were developed for each text. The resulting educational materials can be used to teach university students studying Chinese and majoring in linguistics, oriental studies, economics, marketing and other related specialties. The educational materials can also be used by Russian energy companies interested in cooperating with China.

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Hedges in Written Academic Discourse: A Corpus Analysis of L2 Students' Project Proposals

Средства снижения категоричности высказывания в письменной академической речи русскоговорящих учащихся: корпусный анализ

ABSTRACT.

Hedges, expressions of doubt used in writing to tone down claims, are crucial in academic discourse, as they weaken assertions and make texts less categorical. Even though hedging in academic writing has attracted scholars' attention, the number of works focusing on disciplinary variation in the use of hedges in L2 learners' texts remains relatively scarce. The purpose of this research is to test the hypothesis that students majoring in different sciences employ hedges differently. Specifically, it seeks to explore which discipline uses hedges most frequently, identify the most common hedging devices, and discover subject-specific differences in hedging use by L1 Russian students. The study is based on the analysis of the Perm Corpus of Learner Academic Projects, which comprises project proposals written from 2015 to 2020 by students at the HSE University Perm. The analysis of the data showed that overall, the disciplines that employ hedges most frequently are Management, Computer Science, and Economics. According to the data, the most frequent hedging devices are the modal verbs can, may, could, should, and would, the adjective possible, and the verb suggest. They are used in the learners' texts in different sciences with significant variation.

Keywords: *hedges; hedging; corpus analysis; L2 students; written corpus; disciplinary variation; project proposals.*

Hedges are defined as expressions of doubt used by writers to tone down their "potentially risky claims" (Hyland, 2000, p. 179) as well as to project "honesty, modesty and proper caution in self-reports" (Swales, 1990, p. 175). Hedges play a significant role in academic discourse, weakening the author's claims and making a text less categorical. Even though hedging in academic writing has attracted scholars' attention (Hyland, 1998;

Takimoto, 2015), the number of works focusing on disciplinary variation in the use of hedges in L2 learners' texts remains relatively scarce.

The purpose of this research is to test the hypothesis that students majoring in different sciences employ hedges differently. The objectives of this study are to explore students of which discipline use hedges the most, to identify which particular hedges they use most frequently, and to discover whether there are any subject specific differences in the use of hedging devices by L1 Russian students.

The study is based on the analysis of the Perm Corpus of Learner Academic Projects, which comprises project proposals written from 2015 to 2020 by students at the HSE University Perm. This corpus was compiled by the researchers of the Learner Corpora Laboratory at the HSE University and consists of texts in 6 different disciplines, namely Computer Science, Law, Political Science, Management, Economics, and History. The average length of the text is 2,025 tokens. The size of the corpus is presented in Table 1.

Table 1. Perm Corpus of Learner Academic Projects

Discipline	Number of texts	Number of tokens
Computer Science	59	103888
Law	77	169174
Political Science	29	52726
Management	58	123259
Economics	68	142182
History	43	85072
Total	334	676301

The hedges under consideration comprise 80 linguistic units taken from previous studies on stance in academic discourse, namely lists of attitude expressions suggested by Biber (2006) and Hyland (2005). The full list of hedges is given in Table 3. It should be mentioned that all the possible forms of a particular hedging device were considered. For example, for the verb *assume*, the forms *assumed*, *assumes*, and *assuming* were also searched for. Besides, such hedges as *appear to*, *can*, *could*, *fairly*, *feel*, *kind of*, *rather*, *suggest*, *would* have different lexical meanings depending on the context. Therefore, all the cases of these words being included were considered in context and only those appropriate in meaning were selected.

The corpus data were processed with the concordance function of AntConc 3.4.4 (Anthony, 2014). The statistical significance of the differences in the use of hedging devices was checked with a chi-squared test. The statistical significance was conventionalised as follows: '***' when $p \leq .001$, '**' when $p \leq .01$ and '*' when $p \leq .05$.

The analysis of the data showed that overall, the disciplines that employ hedges most frequently are Management, Computer Science, and Economics (see Table 2).

Table 2. The absolute and normalized frequency (per 100,000 words) of hedges in the Perm Corpus of Learner Academic Projects

Discipline	Number of tokens	Abs frequency	Norm frequency
Computer Science	103888	1630	1568
Law	169174	2014	1190
Political Science	52726	602	1141
Management	123259	1867	1514
Economics	142182	2129	1497
History	85072	1030	1210

The chi-squared test applied to the figures in Table 2 indicates that the variation is highly significant ($\chi^2= 139.32$, $p \leq .0001$).

Table 3 below presents the frequencies of particular hedges across the disciplines.

Table 3. The absolute frequency of the hedges in the texts in six disciplines

Hedges	Comp	Law	Polit	M	E	Hist	Chi-square	p-value
appear to	2	3	1	7	11	1	12.09	0.03361185 *
assume	12	42	17	24	68	17	30.15	0.00001375046 ***
attempt	19	85	13	54	44	30	22.29	0.0004615776 ***
believe	3	73	9	23	37	17	50.01	1.377562 insignificant
broadly	1	1	2	3	0	1	6.89	0.2287172 insignificant
can	456	431	155	39 2	555	195	111.85	$\leq .0.001$ ***
certain amount	0	2	1	0	1	0	4.39	0.3637737 insignificant
certain degree	0	1	0	0	0	1	3.97	0.5532119 insignificant
certain extent	0	5	0	12	6	1	20.55	0.0009849371 ***

certain level	1	1	0	0	0	0	3.25	0.660927 insignificant
claim	13	73	9	23	22	9	47.57	≤0.0001 ***
could	109	50	17	92	94	55	71.11	≤0.0001 ***
doubt	2	8	3	5	4	3	2.29	0.803072 insignificant
doubtful	0	1	0	0	2	0	4.67	0.456864 insignificant
especially	26	41	12	28	24	33	10.79	0.5564989 insignificant
essentially	2	9	0	6	3	5	6.56	0.2557265 insignificant
estimate	45	24	3	21	119	0	165.35	≤0.0001 ***
fairly	4	3	1	1	4	5	6.07	0.2992771 insignificant
feel	0	0	0	1	1	11	61.77	≤0.0001 ***
frequently	8	11	2	1	8	0	12.05	0.03408398 *
from my point of view	0	0	0	0	0	0	-	-
from our perspective	0	0	0	0	0	0	-	-
from this perspective	0	0	0	0	3	0	11.27	0.04628951 *
generally	11	18	8	30	21	6	14.78	0.01133204 *
generally speaking	0	0	0	0	0	0	-	-
guess	0	1	1	0	1	2	5.68	0.3390428 insignificant
hypothesize/ hypothesise	0	4	4	0	5	4	9.09	0.1054567 insignificant

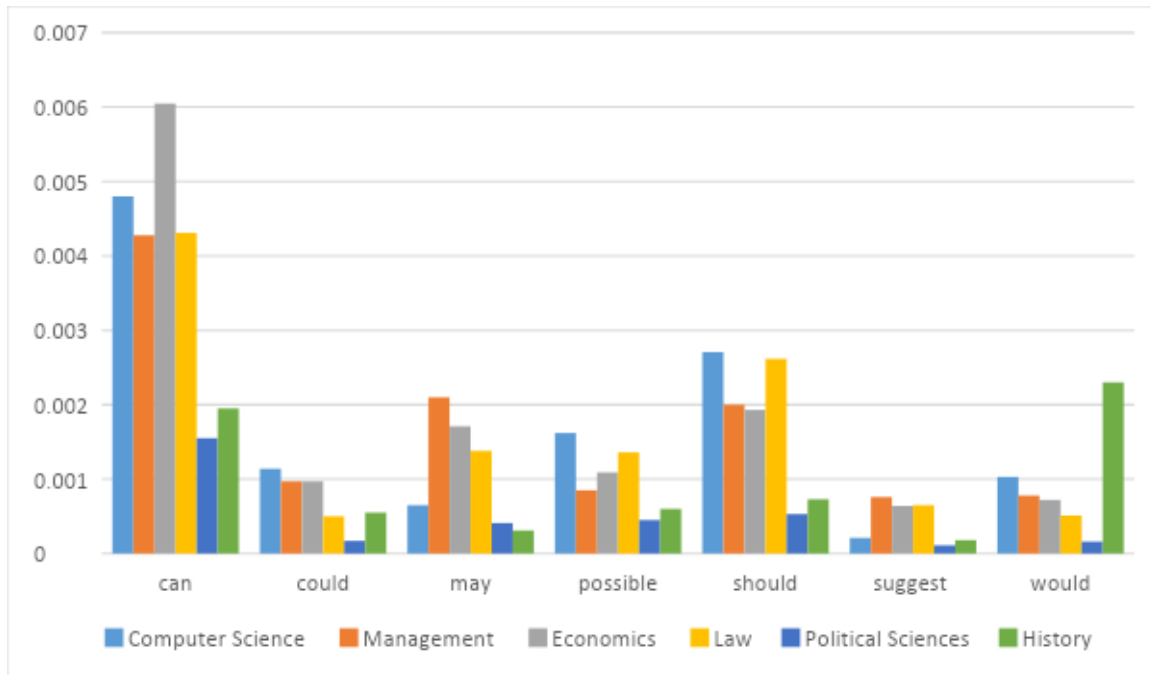
in general	11	26	19	23	24	16	13.75	0.01726101 *
in most cases	1	2	0	0	3	1	3.47	0.6285957 insignificant
in most instances	0	0	0	0	0	0	-	-
in my opinion	0	4	0	0	1	0	8.74	0.1197341 insignificant
in my view	0	0	0	0	0	0	-	-
in our opinion	0	24	2	0	0	2	57.20	≤0.0001 ***
in our view	0	7	0	0	0	0	20.98	0.0008160704 ***
indicate	16	55	7	37	30	7	21.22	0.0007347808 ***
kind of	12	3	3	9	8	7	11.03	0.05081271 insignificant
kindly	0	0	0	0	0	0	-	-
largely	3	17	3	11	7	7	6.50	0.2608219 insignificant
likely	17	19	26	45	39	6	49.48	≤0.0001 ***
mainly	12	18	8	24	20	17	6.19	0.2879844 insignificant
may	65	138	41	21 0	171	31	127.22	≤0.0001 ***
maybe	3	1	0	0	0	1	9.11	0.104867 insignificant
might	39	15	4	25	37	5	44.16	≤0.0001 ***
mostly	7	7	6	16	16	8	8.46	0.1325683 insignificant
often	49	32	11	45	45	29	19.82	0.00135018 **
on the whole	1	4	0	9	3	0	15.81	0.007420563 **
ought	1	1	0	2	2	0	2.58	0.7643735 insignificant

particularly	9	27	14	27	14	9	15.31	0.009098969 **
perhaps	4	3	1	4	6	3	2.03	0.8455947 insignificant
plausible	1	0	0	0	1	0	3.63	0.6033317 insignificant
plausibly	0	0	0	0	0	0	-	-
possible	162	136	45	85	109	60	65.45	≤0.0001 ***
possibly	5	1	0	1	2	1	9.92	0.0775213 insignificant
postulate	0	0	0	0	0	0	-	-
presumable	0	0	0	0	0	0	-	-
probable	1	9	0	1	3	3	9.48	0.091385 insignificant
probably	3	4	3	7	22	5	24.36	0.0001854697 ***
quite	24	27	11	33	37	18	5.19	0.3931212 insignificant
rather	3	14	3	17	11	7	8.79	0.1178511 insignificant
relatively	5	10	9	17	20	5	14.13	0.01481632 *
roughly	5	1	1	0	1	2	8.29	0.1409299 insignificant
seem	14	80	21	46	43	15	30.05	0.00001444936 ***
should	271	262	53	20 0	193	73	114.65	≤0.0001 ***
sometimes	4	9	3	16	10	9	9.15	0.1032801 insignificant
somewhat	1	2	1	4	3	2	2.21	0.8194552 insignificant
speculate	0	1	0	0	1	0	2.38	0.7948769 insignificant

suggest	20	65	11	76	60	18	39.73	≤0.0001 ***
suspect	0	3	1	0	0	0	8.20	0.1454837 insignificant
tend to	8	15	6	22	25	5	13.41	0.01982866 *
to my knowledge	0	0	0	0	0	0	-	-
typical	5	9	2	7	6	14	15.98	0.006910331 **
typically	4	1	1	7	6	6	8.89	0.1135196 insignificant
uncertain	2	5	0	1	5	0	6.26	0.2817255 insignificant
uncertainly	0	0	0	0	0	0	-	-
unclear	0	1	1	0	2	1	3.76	0.584452 insignificant
unclearly	0	0	0	0	0	0	-	-
unlikely	2	2	0	0	5	0	8.88	0.11384 insignificant
usually	26	16	11	41	33	11	23.89	0.0002280657 ***
would	100	51	16	76	72	230	473.52	≤0.0001 ***

According to the data, the use of most hedges (56%) evinced statistically significant disciplinary variation. The most frequent hedging devices are the modal verbs *can*, *may*, *could*, *should*, and *would*, the adjective *possible*, and the verb *suggest*. They are used in the learners' texts in different sciences with significant variation (see Figure 1).

Figure 1. The normalised frequency (per 100,000 words) of the most frequently used hedges in L1 Russian students' project proposals in Computer Science, Management, and Economics



Now we are going to look at some of the most frequently used hedges in more detail. The hedge *may* is most often used by students of Management, Economics, and Law. The most common reason for using *may* is to show the possibilities of implementing certain processes and actions. Despite this, the context and specifics of usage may differ in each sentence. Management students tend to use *may* when they talk about the possibility of using any data or tools for certain companies (example 1). In the works of students of economics and law, *may* helps to describe the expected consequences and possible solutions to problems that may arise as a result of certain actions (2, 3).

(1) The main delimitation of the study is that the data obtained during the research process *may* be of use only to those companies that have the business-processes of procurement and production, as well as the company under investigation (M-2015-23.txt).

(2) The main problem is that NOT and NOV depend on the number and structure of active traders and consequently time series *may* have inconstant dispersion and violate the condition of stationarity (E-2015_30.txt).

(3) As a results of the audit special agents it can be taken two decisions: the case *may* be returned to the IRS civil or collection for the further legal assessment or referred to the Department of justice Tax Division for criminal prosecution, which is the main body in the public prosecution (Law-2015_5.txt).

The hedge *would* is most often found in student papers that relate to the disciplines of History, and Computer Science. However, students of these disciplines tend to use it in different ways. Computer Science students most often employ this hedge when describing the course of their future work in project proposals (4). Students of History use *would* when they make assumptions about certain historical events that could have changed if the actions that led to those events had changed, and when they describe historical facts that would later lead to certain events (5).

(4) The main objective of this research is to attempt to create an analytical system for business-process that would employ Process Mining, based which one *would* feed with data collected from systems logs, and

expect concise report on the process's effectiveness ratio as output (BI_PE_2015_20.txt).

(5) Naturally, all these successes *would* not be if the young Mithridates did not get power (Hist-2015-19.txt).

The verb *suggest* is most frequently found in disciplines such as Management, Law, and Economics. In the texts of these and other disciplines, *suggest* is used to express the thoughts and achievements of the authors of previous studies (6). However, there are cases, for example, in the works of Management students, where the verb in question helps to present conclusions based on limited data (7).

(6) The authors' results for average similarity *suggested* systematic evidence of peer influence: the performance of an individual student tends to become similar (or "assimilate") to the performance of their peers (or to remain similar) (E-2020-9.txt).

(7) However, despite these benefits, the limited amount of research in this area *suggests* that good customer experiences are not prevalent (M-2015-52.txt).

To summarise, the hypothesis has been confirmed. The data analysis demonstrated significant variation in the use of hedges across the learners' texts in the disciplines under consideration. This finding is in line with the conclusions drawn by Hyland (1998), and Takimoto (2015), who proved that there is disciplinary variation in the use of hedges in professional academic writing. As far as particular hedges are concerned, modal verbs were found to be the most popular hedging devices among the Russian undergraduate students, which might be explained by the simplicity of their use, on the one hand, and the presence of similar structures in the learners' L1, on the other hand.

The present study has a number of limitations that should be taken into account when interpreting the results. Firstly, the volume of the corpus. The corpus consists of 334 project proposals written by students of six disciplines, but it may not be representative enough to cover the full range of the written academic speech of Russian-speaking students. Secondly, the study was conducted based on the texts of only Russian-speaking students, native English speakers' works were not considered. Thirdly, in the course of this study, the level of English proficiency of the participants was not taken into consideration, and there is a possibility that there are differences in the use of hedges depending on the level of language proficiency. Fourthly, the research was devoted to the analysis of only one genre of academic writing, therefore the results may not apply to other genres, such as dissertations or research articles.

In the future, it is planned to conduct a comparative analysis of professional and student texts in six disciplines. Not only the disciplinary differences will be investigated, but also the possible difference in the use of hedges, depending on the experience of the authors. Another potential direction is to consider the frequency of hedges from the point of view of the first and second language: for example, a student uses more hedges in Russian (native) or English (non-native) language. Also hedging can be analyzed in oral academic speech, expanding the list of disciplines. Another trajectory for the development of research in this area may be the analysis of hedges in fiction, in cinema, in journalism or in television genres.

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The Image of New Adam in the Novel of John Irving "The Cider House Rules"
Образ нового Адама в романе Джона Ирвинга «Правила виноделов»

ABSTRACT.

The article is devoted to the linguistic analysis of the New Adam image in the novel "The Cider House Rules" by John Irving. The work is cross-disciplinary and takes place at the intersection of culturology, literary studies, and linguistics. Applying the methods of descriptive and stylistic analysis, it examines the linguistic means that allowed the author to create the protagonist's image correlated with the key characteristics of the American Adam figure. The significance of this research lies in contemporary linguistic interpretation of the tradition of the New Adam image as a part of the cultural code of the US national literature. The hypothesis of the research is based on the assumption that the protagonist's image of the novel under study predominantly corresponds to the characteristics of the American Adam of the 17th century due to the similarity of conceptual motives such as "industriousness", "chosenness", "mission commitment", etc.

Keywords: *New Adam; national identity; conceptual motives; American literature; linguistic analysis.*

The New Adam image has always been viewed as a crucial component of American identity (Zhuravleva, 2016). The present work will expand the knowledge of the American Adam archetype literary evolution in the context of contemporary US literature. It is worth mentioning that John Irving is considered to be one of the authors who sheds light on the most urgent problems of American society, namely, immigration and assimilation, threat of terrorism, civil rights, etc. (Huntington, 2004). In the framework of this research, the topicality of his novels will allow us to recreate the most relevant image of the New Adam for modern America.

The issue of linguistic representation of the New Adam image in modern American literature has been underexamined in the studies of contemporary scholars. Although there has been considerable research into the evolution of this archetype as a part of the national cultural code, the latest trends support the need to explore the topic, taking into consideration the literature of modern times. This article addresses the gap by making an attempt at analyzing the New Adam archetype in John Irving's literary works from the perspective of linguistics. It is hypothesized that the protagonist's image in the novel "The Cider House Rules" predominantly corresponds to that of the 17th century due to the similarity of conceptual motives such as purity, industriousness, chosenness, providence, etc.

The primary purpose of this work is to analyze the linguistic means of representation of the New Adam image in the novel "The Cider House Rules" by John Irving. In order to achieve the above stated research goal, it is crucial to investigate the evolution of this figure in the US literature of the 17th — 20th centuries as an element of the American cultural code and identify the main characteristics and motives crucial for its formation. Apart from that, the author will examine the contemporary reflection on the national image of New Adam through the linguistic analysis of the novel "The Cider House Rules".

First and foremost, it seems reasonable to provide an overview of the image under study. K. Baranova and O. Afanaseva refer to the archetype of New Adam as a metaphoric figure that embodies the sense of renewal, individualism, and exceptional destiny of American society (Baranova & Afanaseva, 2014, p. 9). R. Lewis also draws parallels with the biblical image of Adam, highlighting that this image is deeply rooted in religion (Lewis, 2009). The origin of the New Adam archetype dates back to the first Puritan settlements and appeared in American literature of the 17th century which is directly related to the appearance of the fundamental motives often associated with this image: chosenness, innocence, wilderness, industriousness, freedom, etc. (Bradford, 1908). Another point to consider is that the New Adam image is also considered to be a representation of the American dream, entailing a desire of creating a utopia (Lewis, 2009). R. Lewis also remarks on the dichotomy of the archetype being studied. On the one hand, New Adam symbolizes faith, freedom, and the pursuit of happiness. Whereas on the other hand, he is doomed to failure due to his idealistic beliefs and innocence (Lewis, 2009). V. Patea adheres to the opinion that this dualistic nature is an antithesis of the utopian myth and objective reality (Patea, 2001).

The archetype under study had gone through several stages of evolution between the 17th and the 20th centuries. Needless to say, the Adamic figure has undergone significant transformations from the Puritans to the present, being affected by values and beliefs of each epoch.

Defining the New Adam image of the 17th century, many researchers consider providence, predetermination, and mission commitment as basic aspects of this archetype (Baranova & Afanaseva, 2014, p. 9). Among the core features are absolute devotion to God and total rejection of any coincidences (Baranova & Afanaseva, 2014). These traits are reflected in the journal written by W. Bradford "History of Plymouth Plantation," with it

being one of the most influential chronicles of the Puritan movement (Bradford, 1908). Other crucial features to consider are immaturity and purity, that inevitably make New Adam vulnerable to the world's challenges (French, 1974). Another aspect significant for the formation of the New Adam image is the concept of wilderness. K. Baranova assumes that the wilderness was interpreted allegorically by the early settlers and was seen as a place of redemption and sinlessness (Baranova, 2010). Finally, equally important in the context of Adamic myth is a motif of industriousness that is perceived as a fulfillment of God's mission and, thus, viewed as a blessing (Baranova & Afanaseva, 2014). Therefore, the New Adam image of the 17th century is proved to be deeply rooted in religious faith and values.

Tracing the further evolution of this archetype, it is worth noting the transformation of the Adamic myth from the colonial times to a period of Benjamin Franklin's political activity. Despite all the basic similarities inherent to the New Adam image, there are several differences between the two figures. Whereas the motives of wilderness and purity shift to the periphery, such concepts as individualism, industriousness, and chosenness acquire new connotations and relevance (Baranova & Afanaseva, 2014). The scholars also point out that the religious beliefs that occupied a central position in the consciousness of the early settlers, by the end of the 16th century gradually lost their urgency (Patea, 2001). According to B. Franklin, the nature of industriousness transforms from devotion to God to a new conceptual belief that personal prosperity and well-being depend on a person himself (Franklin, 1835).

Unexceptionally, the New Adam archetype continues to be a powerful force in the American literature of the 19th century. As A. Zhuravleva argues, it does not correspond anymore to the biblical myth of New Adam being innocent, pure, and wise (Zhuravleva, 2016). Conversely, there seems to be an ironic attitude towards the category of providence in the literature of the observed period, which leads to the development of a more sustainable ideal (Lewis, 2009). Moreover, there appears to be a category of resourcefulness and resilience that has never been noticed before. In other words, the new image of the Adamic myth undergoes changes, reflecting social changes and people's striving for personal fulfillment.

As for the postwar period, V. Patea highlights the profound changes in the nature of the archetype under study (Patea, 2001). Owing to the experience of violence during the war, the motif of purity and innocence hardens and acquires radical characteristics. Compared to the Romantic image of American Adam, the one of the 20th century manifests himself in the form of rebellion and resistance to the absurdity of contemporary society (Patea, 2001).

Overall, it can be stated that the archetype under study is directly linked to the idea of exceptional American identity and destiny. Having been a permanently evolving motif in the national literature, the Adamic myth reflects the changing attitudes of people towards history, humanity, and American society.

The writers of the 21st century, including the prolific contemporary writer John Irving, continue the tradition and create protagonists embodying the characteristics of New Adam. This image evidently exists on the pages of his novel "The Cider House Rules". Having identified the key characteristics of the archetype, we are able to examine the stylistic devices that were utilized by the author to recreate the figure of American Adam. In the course of analysis, it has been found out that the most significant character trait of Homer Wells, the protagonist of the novel, seems to be his desire to be of use:

"Homer felt full of usefulness at St. Cloud's" (Irving, 1997, p. 14). The metaphor "full of usefulness" likens the protagonist to a container filled with the desire to help and bring benefits to the orphanage.

“He was nothing if not of use” (Irving, 1997, p. 8). The author uses hyperbole “nothing if not of use” to stress the idea of serving for the welfare of the society as a fundamental purpose of Homer Wells.

“Just because you’re having the time of your life, don’t you dare forget how to be of use — don’t you forget where you belong” (Irving, 1997, p. 228). Through the lexical repetition “don’t you forget” in addressing Homer Wells, John Irving emphasizes the protagonist’s duty and responsibility to the orphanage and society as a whole, highlighting his chosenness (“don’t you forget where you belong”) and the importance of being useful (“how to be of use”).

Proceeding with the idea of the protagonist’s chosenness, it seems relevant to examine the following fragment:

“...the spirit of St. Cloud’s had been in a noticeable slump during Homer’s absence and that Homer had been sent by a clearly sympathetic God to revive them” (Irving, 1997, p. 272). The quote seems to be a prime example of the conceptual motives of “chosenness” and “predetermination”. It is crucial that we consider the choice of the verb “to revive” that aligns with the idea of New Adam creating a brand new world. Analyzing the stylistic devices in this example, let us highlight the metonymy (“the spirit of St. Cloud’s”) using which the author identifies the pupils and the employees of the orphanage with St. Cloud’s itself. Apart from that, the metaphor “the spirit of St. Cloud’s had been in a noticeable slump” emphasizes the feeling of desolation and depression resulting from Homer Wells’ departure. The attention should also be paid to the usage of the epithet “sympathetic” in reference to God who in the novel acquires the characteristic of compassionate and involved.

Equally important for creating the New Adam image of the 17th century is the motif of “purity” and “innocence”. This feature is traceable in the text of the novel under study:

“It was so like Nurse Angela, of course, to call Homer Wells angelic, and so like Nurse Edna to speak of the boy’s perfection and of his innocence” (Irving, 1997, p. 59). In the given quote, the author chooses the epithet “angelic” to describe Homer Wells likening the protagonist’s image to an angel or a saint. Needless to say that the figure of an angel, as a rule, is associated with spirituality and symbolizes inner rebirth. To dive deeper, John Irving emphasizes the hero’s impeccability by naming the key qualities of his character: “perfection” and “innocence”. K. Baranova and O. Afanaseva view the categories of inner purity and sinlessness as the fundamental characteristics inherent in the image of American Adam of the 17th century (Baranova & Afanaseva, 2014).

Moving on to the description of the St. Cloud’s orphanage, it is worth examining the following quote:

“What better place for improvement could there be — for self-improvement, and for the good of all — than a place where evil has so clearly flourished if not altogether triumphed?” (Irving, 1997, p. 8). This example draws attention to the dichotomy inherent in the category “wilderness”. As K. Baranova claims, the motif of wilderness has a dual nature as it can be interpreted as an isolated place of both divine provision and the embodiment of devilish power (Baranova, 2010). Considering the linguistic tropes, it is worth underlining the genuine metaphor “evil has so clearly flourished if not altogether triumphed” which compares the phenomenon of evil to a blooming plant that can flood the rest of the world.

To draw a conclusion, the present research focuses on the linguistic analysis of the New Adam archetype in the novel “The Cider House Rules” by John Irving. The results of the study reveal the following conceptual motives to be the most frequently occurring ones:

- “industriousness”, “usefulness”;
- “predetermination”;
- “chosenness”;

- “purity”, “innocence”;
- “wilderness”.

Based on those grounds, it is reasoned to point out the correspondence of the protagonist’s image to the one of New Adam of the 17th century confirming the hypothesis of this article. The given conclusion allows us to suggest that even in modern realities, the canonical image of American Adam still remains relevant. The author adheres to the opinion that the archetype of New Adam was used by Irving as a figure of God’s messenger returning mankind to reflections on eternal questions about good and evil, destiny and meaning of life.

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Large-scale Mapping of Volcanic Domes using UAV Data

Крупномасштабное картографирование вулканических куполов на основе данных БПЛА

ABSTRACT.

The dormant volcanoes in Armenia are significant for understanding the geological structure of our planet. The study "Large-scale Mapping of Volcanic Domes Using UAV Data" reveals different methods for analyzing and interpreting geomorphological data collected by unmanned aerial vehicles (UAVs). The importance of this study lies in its ability to provide more accurate data on volcanic terrain as microrelief forms. The use of UAVs is a modern approach that provides high accuracy and spatial resolution in data collection. The research methodologies include extensive field exploration, UAV-enabled aerial photography, and data processing. This includes generating dense point clouds, digital surface models (DSM) and orthophotos. The research focuses on identifying the features of the landforms and processes of ancient volcanoes. The result is the creation of relief and microrelief maps of the Arailer, Yeratumber, and Armagan volcanoes. Photogrammetric processing helps to achieve maximum resolution, which is important for mapping on a large scale. The use of data obtained from unmanned aerial vehicles for geological mapping of volcanic domes opens up new opportunities for understanding historical volcanic phenomena, thereby creating new scientific knowledge.

Keywords: *Photogrammetry; UAVs; Large-scale Maps; Volcanoes of Armenia; Geomorphological Mapping; Volcanic Domes; Morphometry.*

The importance of studying volcanic domes in Armenia arises from their significant influence on the landscape, ecosystems, and human activity. These volcanic formations, as distinct landforms, are not only geologically interesting but also important for investigating past volcanic activity, including different natural hazards and spatial planning. Despite extensive research in volcanology, there has been a lack of large-scale mapping of volcanic features in Armenia in the scientific literature. This disadvantage limits the ability to analyze ancient volcanoes in Armenia, which could provide valuable information about their evolution and potential future activity.

The study examines three extinct volcanoes in Armenia: Arailer, Armagan, and Eratumber. Aerial photography is suitable for large-scale research, as it allows you to assess the state of vegetation, the likelihood of geological risks (landslides, rockfalls, and mudflows) and create maps for tourist routes and urban development.

Arailer volcano, also known as Karniyarych, is situated between Mount Aragats and the Gegham Plateau on the northern slope of the Yerevan depression in the Kotayk region of Armenia. This ancient Quaternary stratovolcano has an absolute height of 2,614 m. The crater at the top of the volcano has been completely destroyed and is open in a southeast direction, transitioning into a plateau. The perimeter of the base of the volcanic cone is 8.5 km, and the diameter of its crater is 2 km. The central part of the volcano consists of various rocks, for example, andesite basalt breccia and andesite slag breccia. The lower slopes of the southern and southeastern sides are composed of basalts and andesite-basalt rocks (Aslanyan, 1958). The western slopes of the volcano consist of andesites and andesite dacites. The northern slopes contain obsidian, liparite, and breccias. The very first eruptions consisted of ash-gray basaltic andesite. Subsequent eruptions consisted of dark gray andesite and andesite-dacite lava with tuffs, breccias and ash. Over time, alterations occurred and layers appeared. The sequence of eruptions is clearly visible in the canyon of the Kazakh River, where the stratification of these materials can be observed. The soils on the northern and northeastern slopes of the mountain are mainly chestnut and brown forest. The soils closer to the top become more rocky.

Armagan Volcano is located on the western shore of Lake Sevan and is part of the

Gegham Plateau. Its absolute height is 2,829 m. Armagan belongs to a complex of cinder cones, formed as a result of upper Quaternary basaltic and andesitic lava flows. The last eruption occurred earlier than 4,200-3,900 years ago (Karapetyan et al., 1973). The southern slope has deep erosion furrows. The northeastern side has a large lava plateau that reaches Lake Sevan. There is a semicircular crack in the southwestern part and an extended fault with several side craters in the northwestern part. The crater has a diameter of 400 m and a depth of about 50 m. A lake with a diameter of more than 50 m is formed in the crater in spring and summer (Aslanyan, 1968). The chemical composition of the samples from the Aragon slag cone includes approximately 50-55% silicon dioxide, 16-17% aluminum oxide and 6-7% calcium oxide. Samples were taken from different parts of the volcano: the northeastern base, the eastern base and the western base, where various volcanic materials predominate. (Karapetyan et al., 1973).

Eratumber Volcano, also known as Uch-Tapa or Jrbashyana, is located in the eastern part of the Gegharkunik region of Armenia. It has an absolute height of 2,485 m and is a complex central volcano formed from Upper Quaternary basalts and andesite-basaltic lavas. The relative height is 220 m and the diameter is 1,700 m. The crater diameter is about 250-260 m, and the depth is more than 50 m. There are fifteen volcanoes in the Eratumber group located in Gegham Highlands. The largest volcano, Eratumber, has two craters separated by a red andesitic partition (Svyatlovsky, 1971). Volcanic activity is characterized by rhythmic explosive phases and increased lava levels. The last eruption of Eratumber occurred 3,500 to 2,300 years ago. The chemical composition of Eratumber volcano is almost similar to the composition of samples from Armagan volcano, but differs in a higher silica content (about 60%) and a lower content of aluminum oxide. The sample for the study was taken from the top of the volcano (Karapetyan et al., 1973).

The main methods used in this study are field work and aerial photography. During the research, reference markers were established using a GNSS receiver (Choy et al., 2017) in order to create a dense point cloud (Casella et al., 2020). Aerial photography plays a critical role in this process, as all digital products are ultimately created from the UAV images.

The Phantom 4 Advanced UAV was selected for filming the Arailer and Eratumber volcanoes and the DJI Mavic 3 for Armagan volcano. Both vehicles were equipped with high-quality sensors, providing detailed and high-resolution images. The Phantom 4 had a 20-megapixel CMOS sensor, while the Mavic had an L2D-20C sensor. Manual control was used for aerial photography to ensure optimal overlap between images, taken at two-second intervals, covering the entire area. The filming began above the crater and continued in a circle down the slopes, keeping the same distance between the routes. The processing of images from the UAV was carried out using Agisoft MetaShape Professional and Agisoft Cloud software. To get a dense point cloud, you need to follow several steps described in the User's Guide (2024).

1. Image Import and Filtering: The images were filtered based on quality and pitch angle. Images with a quality score less than 80% and a pitch angle greater than 0.1° were deleted.

2. Coordinate System Reprojection: The coordinate system was reprojected from WGS84 to WGS84 UTM Zone 38N.

3. Marker Placement: Markers were set on the satellite image using QGIS 3.30 software and then transferred to the images in Agisoft Metashape Professional.

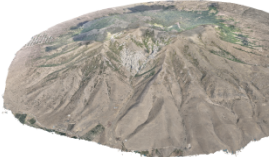
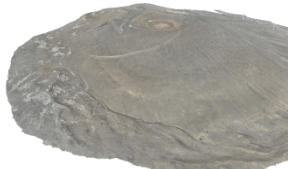
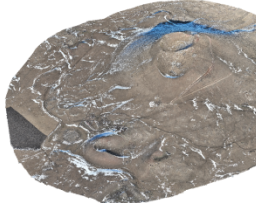
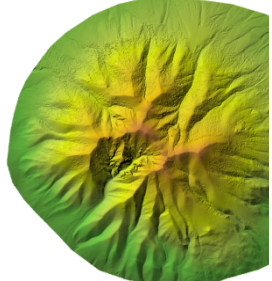
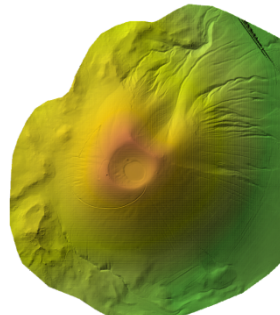
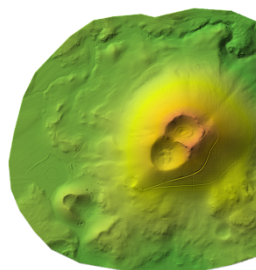
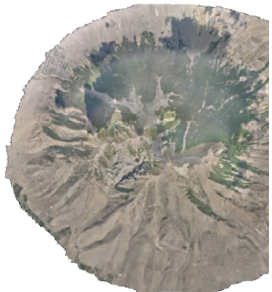

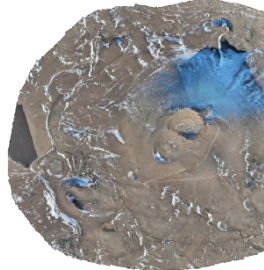
4. Image Alignment: Camera alignment was optimized by photo triangulation using the independent mapping method.

5. Dense Point Cloud Construction: A stereo matching algorithm was employed to analyze every pixel in each image, constructing a dense point cloud.

6. 2.5D Digital Surface Model (DSM) Creation: Based on a dense point cloud, a 2D DSM was created using the WGS 84 UTM zone 38N projection setting. Orthophoto images were generated by projecting the original image onto the DSM. This involved selecting a projection, enabling hole filling mode, and setting pixel size.

After photogrammetric processing, three digital products were obtained for each volcano: dense point clouds, digital terrain models, and orthophotos (Table 1). These products facilitate further mapping and simplify the interpretation process due to their high spatial resolution.

Table 1. Digital UAV data processing products.

Volcano/ Digital product	Arailer	Armagan	Eratumber
A dense point cloud			
Digital surface model			
Orthophoto			

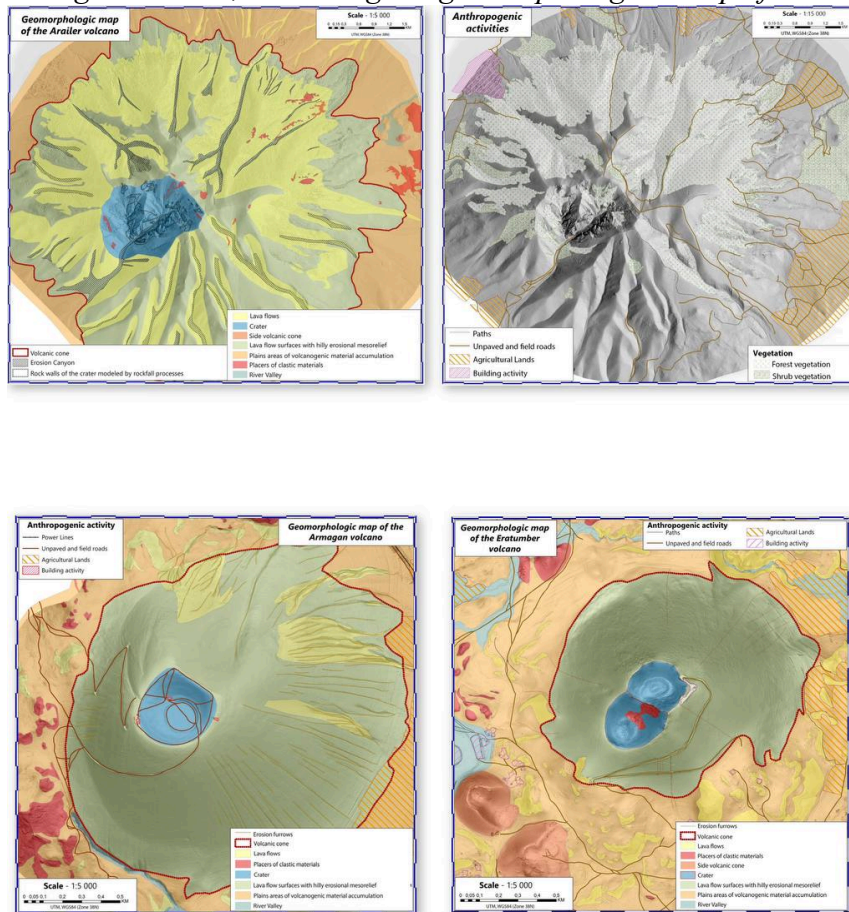
Various morphometric indices were used to distinguish landforms. They were calculated from the constructed DSMs using SAGA GIS software. Morphometric analysis provides a deeper understanding of geomorphic processes such as erosion, sedimentation, and hydrology. 14 major morphometric indices were created: analytical hillshading, slope, relative slope position, aspect, plan curvature, profile curvature, convergence index, closed depressions, total catchment area, topographic wetness index, LS-factor, channel network base level, channel network distance, and valley depth.

The map legend was designed to cover five main parts: processes, landforms, anthropogenic activities, geomorphologic aspects (Lee, 2001), and vegetation. Each element in the legend was assigned suitable symbols and colors to ensure a clear and accurate representation of the terrain characteristics. The process of creating a legend begins with its structuring and differentiation. The division of symbols into separate parts makes it

convenient to put information on the map, and makes it easier to read and use. During large-scale mapping and visual interpretation, various cartographic materials have been developed to provide detailed representations of the geomorphological and anthropogenic characteristics of three volcanic areas.

Ultrahigh-detail data obtained through processing UAV images enables large-scale mapping even of the smallest microrelief features (Hackney & Clayton, 2015). For example, the rock walls of a crater modeled by rockfall processes are highlighted. Open-source data, such as AW3D (Airborne Wideband Digital Elevation Model), ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer), and SRTM (Shuttle Radar Topography Mission) DSMs with a spatial resolution of 30 m, would not have permitted such detailed mapping. This approach to the development of legends and maps using UAV data provides high resolution and significantly improves the accuracy of geomorphological maps (Fig. 1), providing valuable information about the studied volcanic areas.

Figure 1. Created maps (top left – geomorphological map of Arailer volcano, top right – map of anthropogenic impact on Arailer volcano, bottom left – geomorphological map of Armagan volcano, bottom right – geomorphological map of Eratumber volcano).



Arailer Volcano: Two different mapping products were created to represent various aspects and characteristics of the site, providing a comprehensive understanding of its structure and condition. Through ground verification and UAV imagery, it was possible to identify clear crater boundaries and crater walls, which would not have been possible without aerial photography.

Armagan Volcano: One map was developed, covering geomorphologic details and allowing for comparative analysis with other volcanic formations. Aerial photography provided insight into the complex structure of the volcano. Armagan has a side volcanic

cone that is not identified in the AW3D, ASTER, or SRTM DSMs. The most inconspicuous trails and farmland boundaries were also identified, discernible only when viewed at a spatial resolution of 10 centimeters in orthophotos.

Eratumber Volcano: One map was created following a similar approach to that used for Armagan volcano. Based on UAV imagery, detailed mapping of the complex crater structure of Eratumber was conducted. The two craters could not be clearly distinguished using satellite imagery and open-source digital surface models. UAV data allowed for precise delineation of the craters and provided a better understanding of the volcano's morphology.

This research has opened up new opportunities for studying the topography and processes occurring on three volcanoes in Armenia: Arailer, Armagan and Eratumber. Field work, including collecting photographs and checking data on the ground, confirmed the case and made the study more meaningful. The UAVs were used to create highly detailed digital products. Subsequent photogrammetric processing made it possible to create dense point clouds, DSMs, and orthophotos that provide a detailed representation of the studied territories.

Digital products were used for visual interpretation, including the analysis of morphometric indicators and the decoding of data for the identification and classification of landforms, vegetation, and anthropogenic features. Geoinformation layers created using morphometric indexes reflect various features of landforms and their characteristics, which increases the accuracy of interpretation. As a result, detailed geomorphological maps were compiled for each of the three volcanoes studied. These maps provide information about the main landforms, crater structures, lava flows, and debris distribution. A large scale allows you to assess the territory in detail and make decisions, for example, about building or organizing hiking routes.

In continuation of the work, it is planned to conduct a multispectral and thermal survey of the territory for a more detailed study of vegetation and rock composition. Multispectral imaging will help in creating geological maps of three volcanoes, and thermal imaging will contribute to a more detailed study of slope processes and the thermal state of the slopes.

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Multimodal Texts of Magazine Covers Viewed Through the Lens of Functional Pragmatics

Мультимодальные тексты обложки журнала: взгляд сквозь призму функциональной прагматики

ABSTRACT.

This research focuses on American magazine covers containing verbal and non-verbal components, which makes them semiotically complex, multimodal texts. Magazine covers serve as an advertisement tool stimulating potential consumers to buy and read the issue. Magazine covers should catch and hold the reader's attention. Thus, such texts are characterised by attractivity. This category has never been studied in reference to multimodal texts of magazine covers which makes our research novel. The purpose of this study is to analyse the techniques used by designers to achieve attractivity. The research is set in the framework of functional pragmatics. It employs the Multimodal Discourse Analysis complemented by stylistic and functional pragmatic analyses. The sample includes 104 covers of the American magazine Bloomberg Businessweek issued in 2011-2023. The findings reveal that to achieve attractivity, the designers of magazine covers use the following techniques: 1) reducing the amount of information to intrigue readers, 2) employing paradox to stun or shock recipients, 3) playing on words and images that can be called multimodal creativity, 4) using lexemes that belong to colloquial or slang registers. The analysis used in this research can be applied to study attractivity in other types of promotional texts, such as printed ads and TV commercials.

Keywords: *multimodal text; advertising function; magazine cover; attractiveness.*

Modern linguistics is characterised by the growing interest in visual aspects of communication (Chernyavskaya, 2013, Forceville, 2016, 2020). The focus of researchers' attention is on texts that incorporate pictorial elements alongside verbal components. The texts that combine various semiotic codes are called semiotically complex, creolized, multimodal, or polycode (Bateman, 2016, Blinova, 2019, Matulevich, 2019).

Magazine covers are viewed as multimodal texts because they incorporate various semiotic codes. Specifically, such texts are based on the interaction of verbal, pictorial, colour, and graphic codes (Pavlina, Raevskaya, 2023). An important feature of a magazine

cover is its advertising function, which lands the texts of this kind at the intersection of media and advertising discourses. The cover plays an important role in promoting the magazine; it is designed to attract the reader's attention, hold it, and contribute to the recipient's decision to read the announced articles. Thus, the magazine cover is characterised by attractiveness, underpinned by a skilful combination of verbal and non-verbal signs in a multimodal text.

Multimodal texts are studied extensively, as modern communication is increasingly characterised by visualisation. Scholars investigate such media texts as newspaper articles containing illustrations, while magazine covers remain an understudied area of multimodal research. The present research aims to describe the techniques used by designers of English-language magazines to increase the attractiveness of texts of this kind and, as a result, to promote magazine products. The research is set within the framework of linguopragmatics and employs the methods of multimodal discourse analysis, and stylistic and functional-pragmatic analyses. The material for the study includes the covers of Bloomberg Businessweek magazine; the sample consists of 104 texts spanning 2011-2023. The selection is based on how attractive the covers are, so they are characterised by creative use of linguistic elements, images, and colours. The analysis of the sample texts reveals the techniques that allow designers to increase the attractiveness of the sample texts. They encompass the creation of intrigue by way of semantic reduction, the employment of paradox or shock, the use of verbopictorial play.

The technique of creating intrigue by way of semantic reduction

First, the technique of creating intrigue through semantic reduction was identified. A vivid example of the application of this technique is the cover of the Bloomberg Businessweek (December 18, 2023) issue (Fig.1).

Figure 1. The cover “The Trade that Switched off a Country”



The pictorial code includes the image of an electric grid with damaged wires. Below it, there is a sheet of paper torn in half, symbolising a torn contract. At the point of rupture of the objects, there is an inscription: “The trade that switched off a country”. The text at the bottom of the cover provides additional information: “One of the world’s poorest nations

assumed its energy supply was secure. Commodities firms had other ideas”. The non-verbal components help the reader understand the essence of the issue: the image of the power grid reveals a semantic connection with the phrasal verb “switch off”. They highlight the problems in the field of energy supply. The image of the torn contract is related to the lexeme “the trade” (in this context “a deal”). However, the most striking feature of this cover is the deliberate semantic reduction: neither the country that was “turned off”, nor the deal itself, which caused it, is named. The cover creates intrigue, thus attracting the readers’ attention and stimulating them to find out the details of the issue. Thus, the attractiveness of the cover is achieved by semantic reduction, which helps to create intrigue.

The technique of paradox or shock

The second technique we identified is the technique of paradox or shock. It is employed in the texts conveying some idea, which runs counter to the norms accepted in society. It is intended to stun the reader. An example of a multimodal text of this kind is the cover of the magazine Bloomberg Businessweek dated May 28, 2012. The message contained in the text of the cover is conveyed through a simple instruction: “For Euro Crisis Relief Bang Head Here”. It is worth noting the deliberate division of the headline into two parts, in which two meanings of the word relief are played up. The first meaning is related to the economic sphere and can be interpreted as “a measure to combat the crisis”. The second meaning intersects with the medical sphere: in this way, the designers of the cover associate economic problems with a headache, for which “pain relief medication” is needed. The phrase “Bang Head Here” is a reference to the common English idiom “bang your head against a brick wall”, which means to attempt to solve a problem in a way that is unlikely to be successful. The black circle on the cover likely represents the “brick wall” or the crisis itself. Given this context, the message of the cover could be interpreted as indicating that a quick solution to the economic crisis in Europe is unlikely to be found soon. However, it is important to note that this is just one interpretation, and others might have different perspectives on the matter.

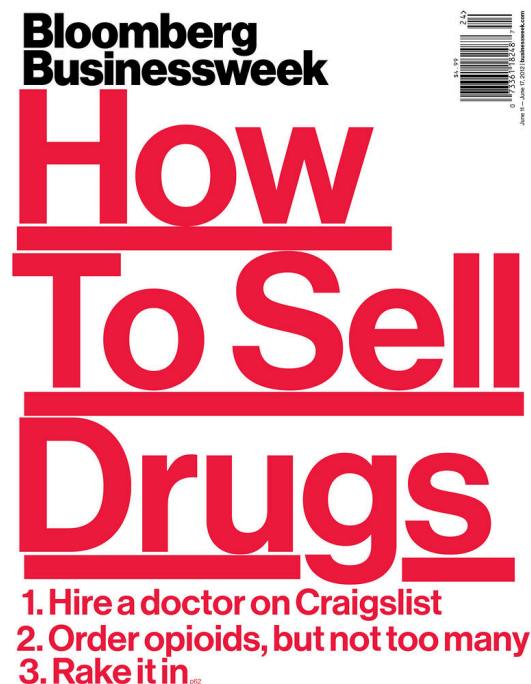
This technique is also used in two other covers of Bloomberg Businessweek dated April 11, 2011, and June 10, 2012, respectively. Both covers have the same beginning of the title – “How to”, referring to popular self-help books. The headline of the first cover is “HOW TO PAY NO TAXES” (Fig.2).

Figure 2. The cover “HOW TO PAY NO TAXES”



The cover shocks the reader by violating the fundamental rule of fair play in capitalist conditions - the mandatory payment of taxes. From the reader's point of view, it is unthinkable that such a respected business magazine as Bloomberg Businessweek calls for violating tax laws. The second cover has a title that can be interpreted as "How to Sell Medicine" or "How to Sell Narcotic Substances" (Fig. 3), making the second meaning shocking for readers due to the fact that such a well-known magazine as Bloomberg Businessweek places an instruction on its cover on how to bypass the rules and sell such goods.

Figure 3. The cover "How To Sell Drugs"



Below the title, an instruction is provided: first, find a doctor on Craigslist, a classified ads service, a kind of American analogue of “Avito”, and second, “order opioids, but not too much”. Opioids are strong painkillers that are prescribed by a doctor, which is why the search for a doctor is suggested. Due to opioids’ strong addictive effect, they are considered substances that cause addiction - they are indicated under drugs in the title, representing a dual definition of this lexeme. The third point of the instruction presented is the phrasal verb “rake in”, which means to earn a large amount of money quickly and easily. This is also shocking to the recipient due to its informality and the implication of making substantial profits from unethical or illegal activities.

So, by combining verbal and visual metaphors, such covers look unexpected and attract the reader’s attention to the announced articles. This method of creating attractiveness is quite effective, as it creates a sense of surprise and shock through the graphic organisation of text, images, and language play, which is intended to interest the recipient.

The use of verbopictorial play

Verbopictorial play refers to the creative use of linguistic and visual means to create several layers of meaning. In such cases, the word play is supported by visual images. For example, verbal and visual elements are used in the text on the cover of Bloomberg Businessweek dated January 24, 2011, titled “APPLE WITHOUT JOBS” (Fig. 4).

Figure 4. The cover “APPLE WITHOUT JOBS”



If “apple” and “jobs” are interpreted as common nouns, the title could be understood as “an apple without work”. However, considering that the lower part of the cover features an image of Apple’s founder, Steve Jobs, the title takes on a different meaning: Apple without Jobs, that is, the company without Steve Jobs. Both the brand name and the proper name Jobs are executed in a colour scheme symbolising mourning, which refers to the main theme of the issue - the future of the company without a unique business leader. The visual and colour codes are important semantic elements of the text, through which a new meaning of the linguistic component is generated. The cover text uses the word play called *pun*

(Shmelyova, 2016), which is supported visually. In this case, proper and common names with the same form are played upon.

Verbopictorial play in magazine covers takes different shapes. In the case of the APPLE WITHOUT JOBS cover, the verbal and non-verbal components are essentially autonomous and complement each other, but there may also be cases where the verbal component blends with the non-verbal component becoming its integral part. An example of such integration is the cover of “Got a Better Idea?” (Bloomberg Businessweek, March 28, 2011), in which the headline is made in the form of smoke coming out of a power plant chimney (Fig. 5).

Figure 5. The cover “Got a Better Idea?”



The colour of the headline also plays an important role - the dirty grey shade of the smoke signals the danger of power plants to the environment. The headline, executed in the form of a question, is supported by linguistic elements giving an answer to this question: “In fact, yes. In a cleaner, greener (in a figurative sense: “environmentally friendly”) and safer future of nuclear energy”. Thus, in this cover, the headline cannot be separated from the image, which can be viewed as a verbopictorial blending.

To conclude, it is worth noting that the employment of skilful combinations of verbal and non-verbal components, the cover of a magazine is capable of producing the desired impression on the reader. The main function of the cover is to attract the reader to the issue of the magazine, which allows for attributing such multimodal texts not only to media discourse but also to advertising discourse, attractiveness being their key feature. To increase attractiveness, designers of English-language covers use such techniques as generating intrigue by way of information reduction, creating paradox, and employing verbopictorial play. Magazine covers are a multifaceted object for research, which calls for further study.

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