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The conference proceedings are published based on the results of the 5th Scientific Student Conference, which was held by the HSE School of Foreign Languages on April 2, 2025.

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CONTENTS

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The Development of an Adaptive Self-management System for a Competitive Agent Based on Reinforcement Learning

Разработка адаптивной системы самоуправления соревновательного агента на основе обучения с подкреплением

Abstract

Reinforcement learning has shown great potential in enabling autonomous agents to learn optimal behavior in dynamic environments. The purpose of this study is to design an adaptive system for autonomous control of competitive agents in a racing simulation environment using reinforcement learning methods.

Within the framework of the methodology, a modified Soft Actor-Critic (SAC) algorithm, integrating an adaptive research strategy based on performance metrics and prioritized experience buffer (PER) is proposed. To stabilize the training, normalization of the observation space is applied and the generation of adaptive competitive scenarios implements the centralized training with decentralized execution (CTDE) in a multi-agent environment. The system was verified using a specialized framework in the Unity Engine, including virtual polygons of varying complexity.

The system is implemented using Unity ML-Agents and supports both single-agent and multi-agent scenarios in a custom racing environment. The resulting framework enables robust learning in competitive tasks, improves training stability, and facilitates scalable interactions among agents.

Keywords: reinforcement learning; soft actor-critic; multi-agent soft actor-critic; prioritized experience buffer; centralized training with decentralized execution;

The study aims to develop an adaptive self-management system for competitive agents in racing simulations using enhanced learning methods. The goal is to create an adaptive self-management system for a competitive RL agent so that it can optimize its own training and solutions in real time (Gronauer & Diepold, 2022).

Modern reinforcement learning algorithms such as Soft Actor-Critic are successfully applied to manage agents in continuous action spaces due to the balance between research and exploitation by maximizing entropy. However, traditional SAC implementations are limited in dynamic multi-agent systems where the changing strategy of opponents and the instability of the environment require an immediate adaptation without a long learning process.

The relevance of the study is that traditional approaches often do not cope with dynamic and competitive environments because they have a low rate of policy learning, and action sampling occurs with some percentage of chance, which leads to sub-optimal behavior and a further decrease in the cumulative reward.

Tasks include implementation of our own algorithm, Soft Actor-Critic (SAC) (Krouka et al., 2022; Li et al., 2023a), to increase the adaptability of individual agents, and creation of the framework Multi-Agent SAC (MA-SAC) with centralized training and decentralized execution.

The system is expected to provide agents with the ability to adapt in real time and improve results in competitive scenarios, which can be applied both in autonomous systems and in-game artificial intelligence.

The key metrics of the study are: number of steps to convergence, time to convergence, average reward and percentage of winning episodes. These metrics will allow you to objectively compare traditional implementations with our solution under controlled conditions.

Proprietary system

Existing approaches to implementing systems for learning with reinforcement follow the principles of modularity and resiliency. The following approaches were proposed for implementation of the system:

- **Configuration of model parameters**
  The ability to configure all model parameters to increase the speed of convergence in the context of each individual task.
- **Environment Interaction Module**
  A shell that allows the SAC algorithm kernel implemented in Python to interact with the least delay with supported environments, which include environments implemented in Unity Engine.
- **Normalization of observations**
  Standardization of input data to stabilize learning, reducing the sensitivity to state distribution (Li et al., 2023b).

Proprietary algorithm Soft Actor-Critic

The SAC algorithm balances maximization of rewards and entropy of policy to encourage research, but has limitations in stability and adaptability. To eliminate them, the following modifications are proposed:

- **Symmetric log normal initialization**
  Initializing network weights to avoid bias and promote balanced research.
- **Prioritized experience buffer**

A sample of actions based on assigned priorities during learning that are stored in the segmental tree of sums, which provides asymptotically effective operations (O(log N)) for priority refresh and lookup. The results of the comparative analysis of the use of priority in buffers are shown in Chart 1. The final implementation of the buffer is presented in Figure 1.

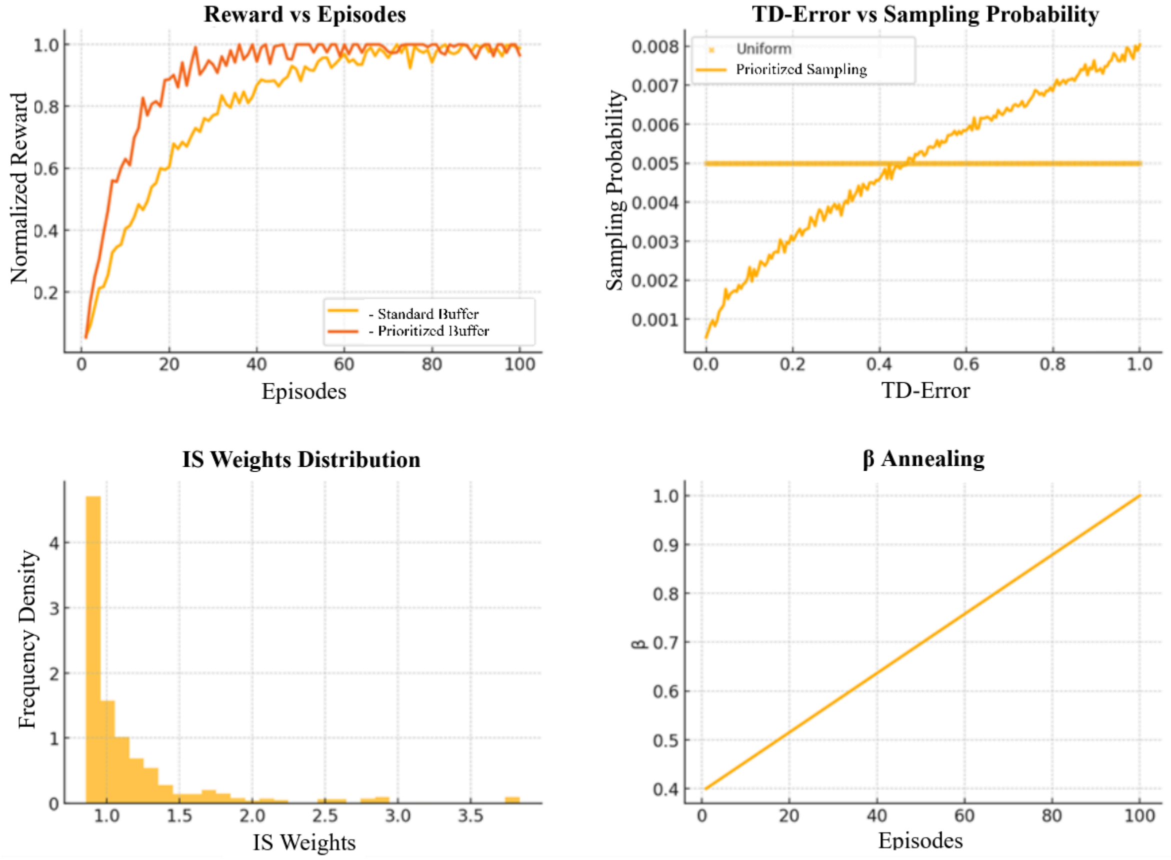

Chart 1. Comparative analysis of the use of priority in buffers

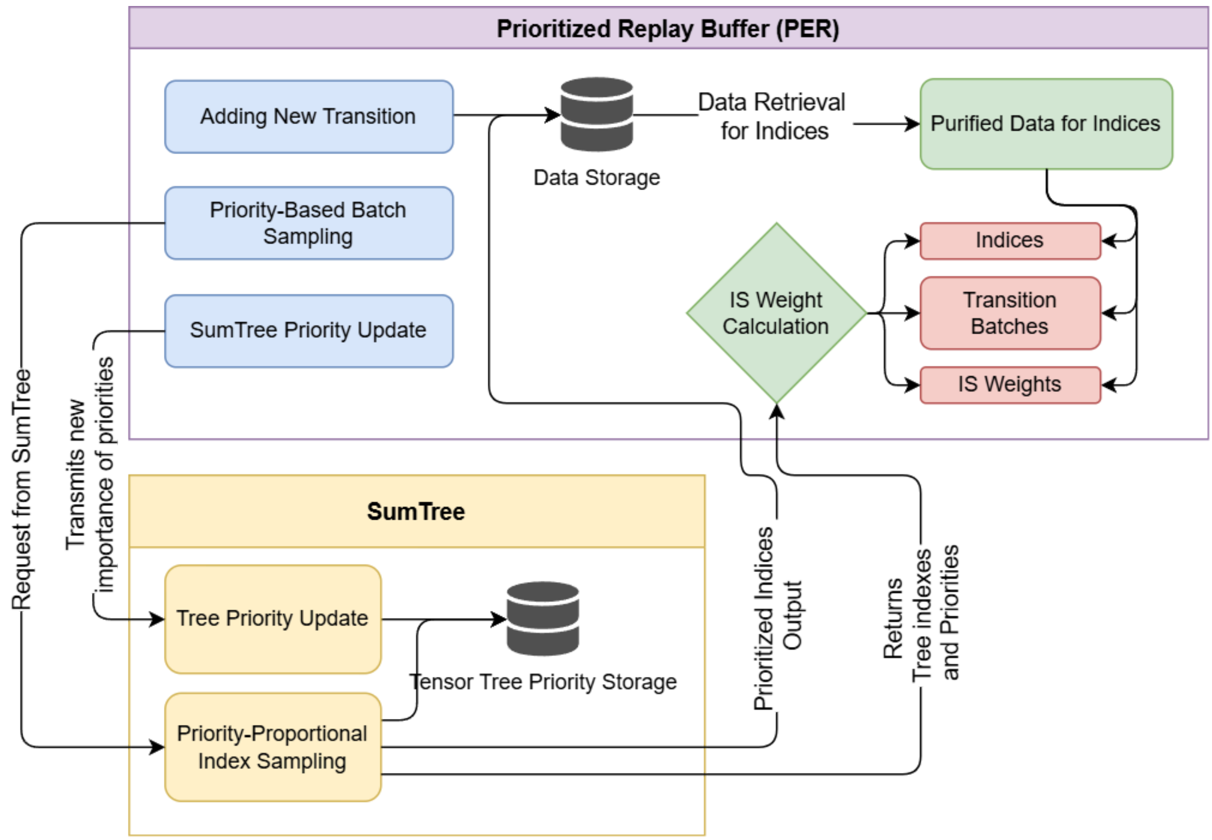

Figure 1. Comparative analysis of the use of priority in buffers

- **Performance based research adjustment**
  Adjust the level of research on the basis of the average value of the last awards of episodes; if the productivity does not increase, the study increases, otherwise it decreases.
- **Support for various types of data and devices**
  Dynamic checking and switching to bfloat16 (Osorio et al., 2022) when available, adaptive use of pinned memory and asynchronous CUDA streams.
- **Performance of the code**
  All critical parts are wrapped in torch.jit.script, which allows to speed up execution and reduce the overhead costs for Python-linkage.

These changes are aimed at increasing the stability, research efficiency and generalizing power of SAC.

Multi-Agent SAC

In competitive multi-agent environments (Sheng et al., 2022; Zhu, Dastani, & Wang, 2024), such as racing simulations, agents must adapt to the dynamic strategies of rivals. Offered framework MA-SAC, using centralized training with decentralized execution (CTDE) (Azzam, Boiko, & Zweiri, 2023):

- **Centralized training**: during the training, agents have access to global status information, which helps to account for interactions between agents.
- **Decentralized execution**: during execution, each agent operates on the basis of local observations, ensuring operability and scalability.

Each agent uses an enhanced SAC, and the rewards feature is designed to balance speed, security, and strategy, including rewards for progress, circle completion, collision penalties, and speed maintenance.

To enhance stability and adaptability in the presence of non-stationary opponents, the system incorporates **Fictitious Self-Play (FSP)**. In this approach, agents are trained not only against current opponents but also against a pool of previously encountered strategies, stored and sampled over time. This allows agents to generalize their policies against a mixture of behaviors, mitigating overfitting and promoting convergence toward equilibrium strategies. FSP enables a form of historical self-play, where agents iteratively refine their policies by responding to an evolving distribution of past opponents, improving long-term robustness in competitive environments.

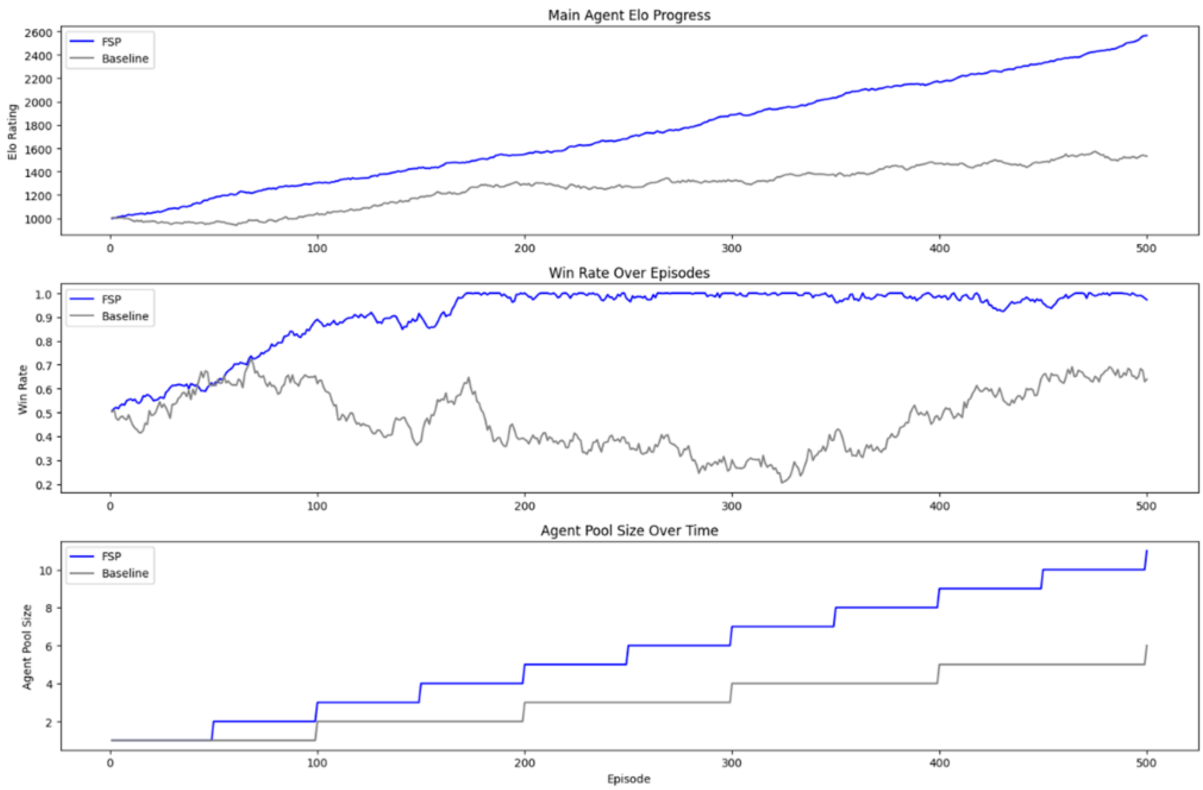

Chart 2. Graphs comparing implementations with and without FSP

Comparative analysis

Comparison with existing methods shows that traditional approaches such as SAC via Unity ML-Agents and RLlib perform reasonably in single-agent settings but demonstrate limited reward growth and slower convergence. As shown in *Chart 3*, the **custom SAC architecture** achieved higher rewards and faster learning within 100 episodes, confirming the advantage of architectural enhancements like modular design and observation normalization.

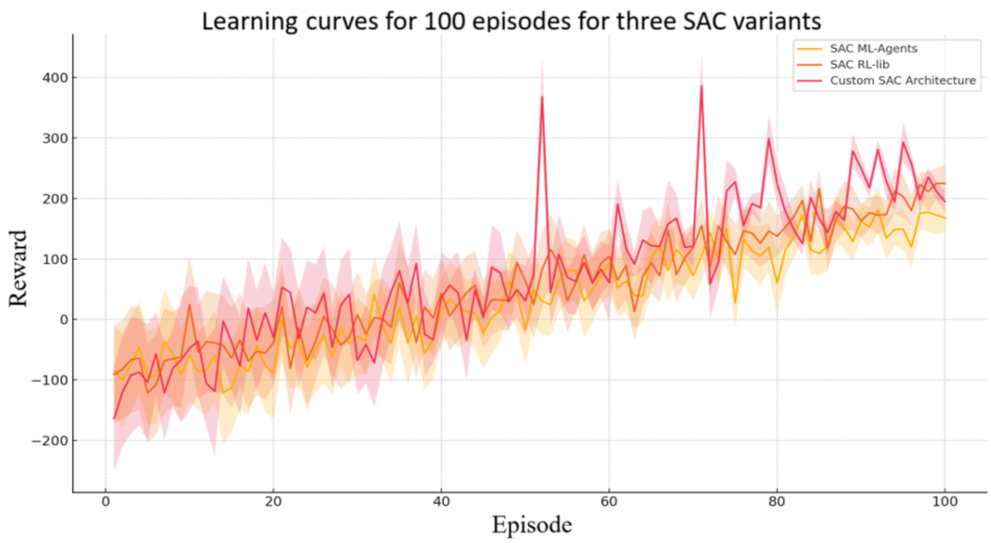

Chart 3. Graph of the curves of three models

In multi-agent scenarios (*Chart 4*), basic SAC without CTDE or FSP yielded the **lowest average reward** and **slowest convergence**, indicating poor scalability. Adding **CTDE** significantly improved both metrics by enabling coordinated learning during training. Incorporating **Fictitious Self-Play (FSP)** further enhanced adaptability through training against historical opponent strategies.

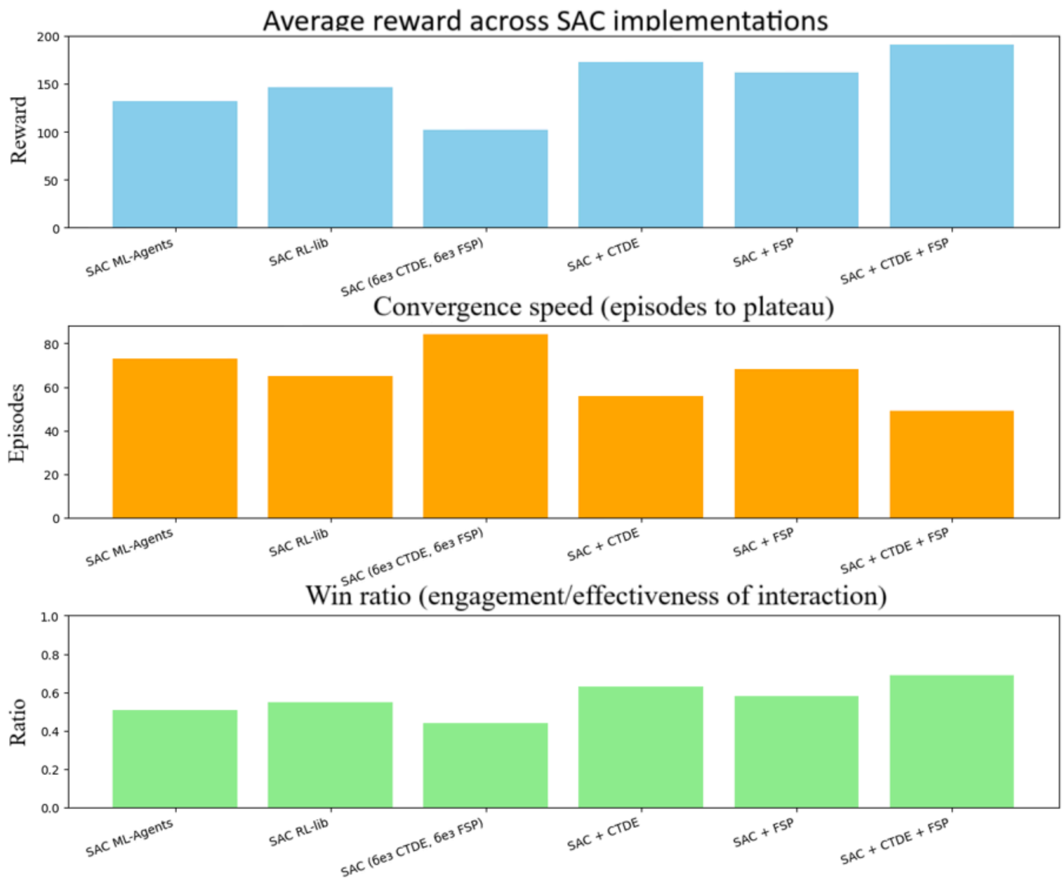

Chart 4. Graphs comparing MARL implementations

The **best overall performance**—in terms of reward, convergence speed, and win rate—was observed in the **SAC + CTDE + FSP** configuration. This combination ensured faster learning and more robust competition strategies, highlighting its effectiveness for dynamic, competitive environments.

The system demonstrated:

- increased adaptability of agents to real-time changes in environmental conditions and competitor behavior;
- a fewer number of collisions as a result of improved coordination and predictive capabilities;
- enhanced competitive performance, including higher winning rates and faster lap times.

These results confirmed the system's effectiveness in improving the performance of competitive agents in racing simulations and contributed to the field of advanced reinforcement learning and autonomous systems by providing a scalable approach to complex real-time decision-making tasks.

In the course of research, an adaptive self-learning system for competitive agents was developed on the basis of a modified algorithm Soft Actor-Critic. We created a test environment in the Unity Engine to check if the algorithm is working correctly. Introduction of normalization of observations, symmetric log normal initialization, The priority buffer of reproduction and dynamic adjustment of parameters combined with the paradigm of centralized training and decentralized execution allowed a significant increase of the adaptability and efficiency of agents in dynamic and competitive conditions of racing simulators. The practical importance of the results obtained lies in the possibility of applying the proposed approach to create autonomous systems in the transport and gaming industries, as well as to solve problems of interaction of several robots in changing conditions.

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Gilyarovsky, Khitrovka and Journalism

Гиляровский, Хитровка и Журналистика

Abstract

This is a study of V.A. Gilyarovsky's most famous story "Moscow and Muscovites". In 2023, a film based on this work was released, which became a relevant occasion to remember the historical figure, the "King of Reports", and his influence on journalism.

During the research the book "Moscow and Muscovites" was analyzed; the works of other researchers related to a specific place and chapter: Khitrov market; the techniques that "Uncle Gilyay" used in his work as a journalis were studied; a number of skills and qualities that helped him were identified, the research describes their necessity for a novice journalist; compiled the information received; a list of necessary skills for a young journalist were recieved, a tour with an interactive element of modern places of Khitrov market was created. The research proves the importance of studying the life and works of historical figures, and the usefulness of their experience for the younger generation of specialists in their field. It also allows the creation of by-products from the knowledge gained to popularize information in modern society.

Keywords: Gilyarovsky; Khitrovka; Journalism; King of Reports; distinctive features

Currently, according to the statistics of the Ministry of Education and Science of Russia for 2024, more than 30.5 thousand future specialists are being trained in higher educational institutions of the city of Moscow in educational programs of journalism. (Ministry of Science and Higher Education, 2025) Students fill out portfolios, absorb new skills and techniques to be more competitive in the future and do their jobs well. One of the effective methods of developing such a "professional base" is to adopt the experience of senior colleagues, successful personalities and established journalists. The same applies to historical figures, figures whose works helped the media sphere itself to form. Vladimir Alekseevich Gilyarovsky, the "King of Reports", achieved a lot during his life and was an outstanding example of a journalist. In the spring of 2023, there was a premiere of the film "Khitrovka. The Sign of Four». (Smotrim, 2023) The setting is based on the book by V.A. Gilyarovsky "Moscow and Muscovites", which tells about life and situation in the most "lost" and marginal territories of Moscow at the beginning of the 20th century. (Gilyarovsky, n.d.) "Uncle Gilyai" and his journalistic works, especially the bright character and rhythm of life, received additional fame. As well-known in the 1880s and 1920s in Moscow, he achieved success in many areas of life and was particularly good at his professional activities as a reporter, he became a key figure in the study. The difficulty was that a lot of time had passed since the period of his publications, and many skills would have to be adapted to modern conditions and trends, and the materials for covering his work were often in archives or on foreign resources as well. Many collections, for example, "Moscow and Muscovites", were reprinted many times and even different literature and sources were used in the compilation of the study in different periods.

The purpose of the study was to find out the components of the success achieved by the "King of Reports" by V.A. Gilyarovsky. In addition, the study of the influence of his inner qualities, including character or habits, on his work, as well as the tracking of techniques and characteristics used in the role of journalist. It is necessary to review a lot of materials, including articles, archival records, literary sources and historiography. They were reports from the pen of "Uncle Gilyai" (Gilyarovsky, n.d.), his book "Moscow and Muscovites" (Gilyarovsky, n.d.) and other publications, notes of his contemporaries about him (Chekhov, 1936; Stanislavsky, 1988) Other aims are the following: to collect all the information found in a single block and analyze it. To identify trends and cause-and-effect relationships between the results of V.A. Gilyarovsky's activities and the highlighted features and to substantiate them. To compile a brief overview and a list of the skills and characteristics that allowed the reporter to succeed in many areas, as well as a professional portrait of this historical figure. Additional information with accompanying and illustrative functions should also be turned into a convenient format and used for the best assimilation of information by novice media specialists.

As a result of the work done, it turned out that Vladimir Gilyarovsky was not only an outstanding journalist, but also a versatile person. The first thing that helped him on his life path was his remarkable strength. From childhood, "Uncle Gilyai" learned the techniques of combat, which was facilitated by good heredity and Cossack roots, so from an early age he formed an awareness of his own safety; he could always stand up for himself, so he boldly went to the darkest corners and professions. In various sources, V.A. Gilyarovsky's habit of twisting spoons with one finger in front of any audience was indicated, which served as the emergence of authority in front of the eyes of the viewers and immediately showed the power in the hands of the writer. Next came his sociability. From his very youth, the "King of Reports" found a language with representatives of completely different classes, professions and lifestyles. In addition to the fact that "Uncle Gilyai" was generally an easy-going and decisive person, his views on life played a significant role in his ability to find a common language with any people. V.A. Gilyarovsky believed that if you behave like a human with notorious cunning, then he will become more humane; that it is impossible to return evil for evil, and after caresses, any person can correct himself if he is given a chance. At the same time, he knew how to stand his ground and solve things on the spot, if necessary—with fists and abuse—but at the same time he had a clear point of view on any matter. The "King of Reports", aka "The Newspaper Man" in the more marginal districts of the capital, was a hospitable friend and companion, straightforward, at the same time quite spontaneous and chaotic person. He could easily disappear for a few weeks, going with a friend to drink real wine in Georgia, because you will not find such a thing in Moscow, or grab a new companion on the way to his newly appeared route, as his contemporaries, comrades and relatives wrote. (Chekhov, 1936) At the same time, he was quite curious, since he was said to have "cared about everything", and partly because of this, along with numerous acquaintances in the wider social life, he was well-informed about many events before other departments. His diverse set of professions also helped: in Moscow alone, in addition to the fields of journalism and journalism, he touched on firefighting, then belonging to the police department, as well as theater — rather directing. Because of many of the already mentioned features and the ensuing consequences, "Uncle Gilyai" was an interesting, erudite conversationalist, which only complemented his ability to get anyone to talk.

Furthermore, it was necessary to turn directly to the texts of V.A. Gilyarovsky. The peculiarity of his language is vividness, a natural description of the events taking place. In his journalistic work, it was mostly revealed in descriptive characteristics, free overview narration, interspersed with episodes of action in certain locations. (Gilyarovsky, n.d.) A distinctive feature of his first reports for Russian journalism was the creation of the "effect of presence" among readers by influencing them in several ways at the same time. Capacious but detailed descriptions contained colorful details, conveyed the sound, smell, and sensations of a person in the unfolding situation. At the same time, neutral, sometimes intentionally reduced vocabulary plays a role, the inclusion of remarks of surrounding people — victims, workers, local residents, witnesses, in the original, philistine version, as well as the abundant use of various toponyms and the mention of famous local personalities. This is how V.A. Gilyarovsky achieves the reader's immersion in the situation of what is happening: there is a feeling that the same sounds, smells and screams surround a person together with the reporter, the proximity of the mentioned place causes a feeling of authenticity, greater plausibility, and a relatively small volume captures his attention. (Yankina & Rzhanova, 2020)

From a variety of excerpts and information, a list was compiled, succinctly reflecting the features and characteristics that were singled out as greatly helping V.A. Gilyarovsky as a journalist. Basically, the features of "Uncle Gilya" as a person were included, with some inclusion of the stylistics of his texts. The list is called "**The Highlighted Distinctive Features of the 'King of Reports' are:"** and contains 11 key lines:

- *Sociable, could talk to anyone*
- *Had no prejudices, was "simple", communicated "on an equal footing" with both representatives of the authorities and drunken beggars*
- *But did not disclose much about himself, if he came on business, he was quickly engaged in it*
- *Bold and brave*
- *Strong since childhood, could bend coins with his fingers, which helped to create an impression*
- *Confident in himself and his strength, security*
- *Chaotic, in his own mind*
- *Not depending on the opinion of others*
- *Honestly recording what he saw*
- *Witty and erudite*
- *Had his own opinion about many things, as he had tried different things in his life.*

In addition, during the selection of necessary information, many related facts were collected. These data seemed interesting and were closely intertwined with the chapter "Khitrovka" in the book "Moscow and Muscovites" by V.A. Gilyarovsky. Since historically the area of the Khitrov market is located within walking distance from the university, a walk was made along the modern square of the same name. It was also decided to combine the information received and create an excursion on its basis dedicated to the transformed area of the time of "Uncle Gilyai". This is how certain route points and a rough plan of the excursion were formed, which could make it possible to convey the collected data about the "King of Russian Reportage" and his traits and skills in a convenient and accessible format. With a company of volunteers, a test walk was made along the proposed sightseeing stops of the tour. However, there was a catch: as it turned out, from July 1, 2022, a special certification is required to conduct excursions, so the implementation of this project was not possible.

Instead, the idea of a podcast was proposed. A virtual audio guide would make it possible to use the same interesting, but adapted format to disseminate the results of the study to the target audience. A historical story based on the journalistic work of V.A. Gilyarovsky would include information about the author himself and reveal his professional side as a journalist. At this point, such an implementation plan remains a good prospect for further research development. Even now, the results of the work contain a detailed description of the "King of Reports" from a professional point of view. There are concise theses, drawn up in a prescribed list of qualities and character traits that helped V.A. Gilyarovsky in his life and journalism. This list can become a guideline for future media specialists, quickly and comprehensively introducing them to an outstanding personality from whom it is worth learning from experience. The ability to find a common language with almost any person and the ability to write capacious, lively texts that make a strong impression on the reader due to the competent use of appropriate vocabulary and tools — toponyms, sound sensations, less often, insignificant evaluation, and others remained separate emphasized skills. A special help will be self-confidence, which comes from a sense of security, for which you should be able to protect yourself and your interests, perhaps mastering some self-defense techniques. The general recommendations enshrined in the eleven theses may find an even more convenient application or form, aimed at presenting another worthy example for the next generation of journalists to follow.

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Prospects for Polish–Russian Relations: A Quantitative Analysis
Перспективы польско-российских отношений: количественный анализ

Abstract

This article presents a quantitative analysis of electoral behaviour in the 2023 Polish Sejm election and Polish internet discourse regarding Russia, focusing on public support for restoring Polish–Russian diplomatic ties and, consequently, on the prospects of relations between the two countries. 'Pro-Russian' electoral behaviour is operationalised as voting for the Confederation Liberty and Independence party, the only political force in the Sejm that has not adopted an overtly anti-Russian stance. The results of the pattern analysis of the election data indicate a Poles' weak demand for restoring relations with Russia, although some provinces, particularly in the historical region of Galicia, exhibit a higher tendency towards 'pro-Russian' voting. The analysis of Polish-language posts and comments, as well as news headlines related to Russia, using text mining methods, namely agglomerative hierarchical clustering and sentiment analysis, further demonstrates Polish society's rejection of the idea of normalising relations with Russia and suggests that such a development is unlikely anytime soon.

Keywords: Polish–Russian relations; 'pro-Russian' electoral behaviour; Confederation Liberty and Independence (Confederation); Galicia; pattern analysis; ordinal-invariant pattern clustering; text mining

In May 2023, Dmitry Peskov, the press secretary for the President of the Russian Federation, explicitly outlined Russia's diplomatic stance on Poland, labelling it a 'hostile state' towards Russia and accusing its leadership of 'literally going into the hysterics of Russophobia' (Alexandrov, 2023). Historically, the relations between Russia and Poland have been fraught with tensions, dating back to the Middle Ages and persisting to this day (Khraban et al., 2023) despite the numerous bilateral attempts to normalise the diplomatic ties after the fall of the USSR (Jureńczyk, 2019; Khraban et al., 2023). The situation deteriorated further following February 24, 2022, with Polish–Russian relations reaching a low point unprecedented in the twenty-first century.

Nonetheless, as Bieleń (2014, p. 65) notes, referring to the relations between Russia and Poland, 'once it was difficult to imagine French–German cooperation'. Indeed, no matter how complicated and antagonistic the relations between the two countries may be, there always remains a possibility for reconciliation. The diplomatic rapprochement between Russia and Poland would represent a de-escalation of the growing conflict between the two countries (Jureńczyk, 2019) and would also provide long-term economic benefits for both nations (Jakimovich, 2016). It would also be of immense strategic importance to Russia, because of Poland's (a member of the EU and NATO alliances) geographical proximity to it. Moreover, reestablishing Polish–Russian cooperation would be a step towards restoring a peaceful political climate across Europe.

In this regard, the present paper examines the prospects of rebuilding the Polish–Russian diplomatic ties using a twofold methodology: the findings are based on the official 2023 Sejm election data published by the National Electoral Commission of Poland for 31,495 polling stations, as well as on the dataset of 133,192 publications in Polish from social networks (Telegram, YouTube, X / Twitter) and Polish news outlets. Employing two text mining methods – agglomerative hierarchical text clustering and sentiment analysis – this paper reveals the prevalence of negative and neutral sentiment in Russia-related Polish-speaking online space, regardless of the subject matter (military, politics, economy). In turn, applying the ordinal-invariant pattern clustering algorithm, a novel method to group (cluster) polling stations according to their voting patterns, this analysis finds that there are no regions in Poland that would demonstrate a clear pro-Russian electoral behaviour. Nevertheless, this paper locates Polish regions (which primarily occupy the Polish historical territory of Galicia) as most supportive of 'pro-Russian' political forces. Since the chief component of the research design of this paper is the election data analysis, a concise overview of the 2023 election and the political ideologies embraced by five major parties represented in the Sejm is provided next to gain a deeper understanding of Poland's political system.

The electoral diagram presented in Figure 1 illustrates the outcomes of the 2023 Polish Sejm election. An oppositional pro-European coalition of centrist (liberal-conservative and moderate left-wing) parties—Civic Coalition (*Koalicja Obywatelska)*, Third Way (*Trzecia Droga*), and The New Left (*Nowa Lewica*)—managed to win just over half of the seats in the 10th term Sejm (248 out of 460), thus ending the eight-year dominance of the ruling Eurosceptic and consistently anti-Russian (Liszkowska, 2023; Pashkovskiy, 2023) Law and Justice (*Prawo i Sprawiedliwość*) faction. As for the parties (and their predecessors) in the opposition coalition, until February 24, 2022, they had maintained a relatively neutral stance towards Russia (Dębowski, 2023; Liszkowska, 2023; Pashkovskiy, 2023; Sokół, 2022). Afterwards, however, their rhetoric regarding Polish–Russian relations shifted to a strong condemnation of the Russian foreign policy. In contrast, Confederation Liberty and Independence (*Konfederacja Wolność i Niepodległość*), hereinafter abbreviated as Confederation, is the only coalition in the Polish parliament that remains relatively neutral towards Russia (Pashkovskiy 2023; Sokół 2022; Szwed-Walczak 2023). The party belongs to the far right of the political spectrum, adhering to a traditionalist ideology in a cultural sense and arguing for a libertarian economic policy. According to Politico's 'Poll of Polls' survey aggregator, since the Sejm election, Confederation's support has risen from 7% to 17% as of June 2025 (Poll of Polls, n.d.).

Party / Coalition	Votes (%)	Seats
Law and Justice	35.38	194
Civic Coalition	30.70	157
Third Way	14.40	65
The New Left	8.61	26
Confederation	7.16	18

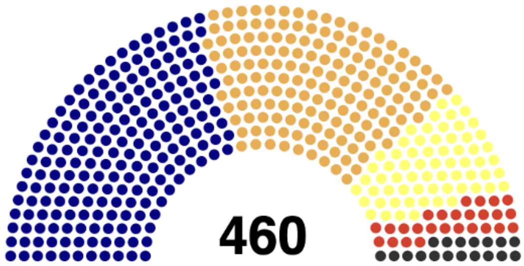

Figure 1. 2023 Sejm election results: votes and seats by parties

This paper refers to the Confederation party as 'pro-Russian' and defines voting for it as 'pro-Russian' electoral behaviour. This is because, given the political climate in Poland and public opinion about Russia post-February 2022 (Fagan et al., 2023; Scovil, 2024), open support for Russia by any Polish party would effectively amount to political self-sabotage. Since Confederation is an extremely conservative party, this study hypothesises that the highest concentration of 'pro-Russian' electoral behaviour will be observed in the two modern-day provinces of Poland – *podkarpackie* (Subcarpathian) and *małopolskie* (Lesser Poland) – which lie in the historical Polish region of Galicia. This expectation is based on the fact that the electorate of this area tends to favour right-wing and conservative parties in general, and more importantly and specifically, radical conservative (traditionalist) parties (Zagórski & Markowski, 2021; Zarycki, 2015), which is precisely the case with Confederation.

To analyse the attitudes regarding Polish–Russian relations, Russia, and Russians in general in the Polish-speaking online space, three social networks popular in Poland: Telegram, YouTube, and X (formerly Twitter), were scraped using the 'Medialogia' automatic media and social networks monitoring system, as well as my own YouTube comments scraper implemented in Python. In addition, news headlines, containing the publications of three major Polish news outlets: Onet, PAP (Polish Press Agency), and Inertia, were downloaded from the open SpeakLeash library (see SpeakLeash, 2024). The resulting textual data sample ($N = 133{,}192$) is distributed across social networks and media as follows: Telegram – 67,115 posts and comments; YouTube – 39,632 comments; Twitter – 18,680 posts; Polish media – 7,765 news. Each observation in the dataset is written in Polish and contains either the word *'Rosja'* (Russia), or *'Rosjanin'* (Russian as a citizen of the Russian Federation or as an ethnic Russian), or *'Rosyjski'* (Russian as in Russian language) in all possible forms and declensions. All duplicates were removed from the data. Approximately 90% of the data falls between April 4, 2023, and April 4, 2024, although there are some observations dating back to March 24, 2022.

The text mining algorithm involved four chief stages. First, the collected sample of posts, comments, and news was preprocessed (cleared of stopwords and punctuation marks, lowercased, etc.). Second, the textual data were vectorised (given a numerical representation) to ensure that it is suitable for the use of machine learning algorithms. Although there are numerous different text vectorisation models, such as bag-of-words, TF-IDF, GloVe, Word2vec, etc., in this paper, the BERT-based model presented in (Reimers & Gurevych, 2019) was employed to generate word embeddings (vector representations). This choice is motivated by the fact that this model generates semantically meaningful embeddings, while keeping their dimensionality relatively small: only 512, which is highly efficient computationally. Third, the obtained vector representations of texts were divided into clusters. For this purpose, this study employs agglomerative hierarchical clustering, in which all objects initially represent their own cluster and then are combined into clusters of larger size using specified metrics. We utilise cosine similarity as a measure of semantic proximity between a pair of texts, which is the most suitable metric given the task at hand (Ghosh & Strehl, 2006; Popat et al., 2017). Lastly, the texts in the resulting clusters were machine-processed to determine their sentiment (positive / neutral / negative). This kind of text processing is a classification task, generally referred to as sentiment analysis. To perform the sentiment analysis procedure, a state-of-the-art multilingual model trained on approximately 198 million posts from Twitter (see Barbieri et al., 2021) was employed. Having done so, I was then able to examine the sentiment of posts, comments, and news in general, as well as in each of the clusters identified beforehand.

A total of three largest and most substantial clusters were identified using hierarchical text clustering. The most frequent words in these clusters were visualised using word clouds

(Figure 2). Items that had too much weight in more than one cluster, such as *'Rosja', 'Rosyjski', 'Rosjanin', 'Polak',* 'NATO', etc., were removed from the word clouds.

Figure 2. Word clouds, visualising term frequencies in each cluster

One can observe that each cluster is dedicated to its specific subject, which indicates that the application of agglomerative hierarchical clustering to the text sample has been a rather effective measure of dividing the texts into semantically similar groups. Hence, cluster No. 1 (69,015 components) is centred on military topics. The key words herein are: *'zbrojny'* (armed), *'wojskowy'* (military), *'obrona'* (defence), *'sprawa'* (cause / matter), *'wojsko'* (army). On the other hand, cluster No. 2 (63,083 components) is related to diplomatic or political affairs, as the most frequent words in it are: *'prezydent'* (president), *'wiedzieć'* (to know), *'świat'* (world), *'państwo'* (country / state), *'sprawa'* (cause / matter). In turn, cluster No. 3 (1,094 components) is devoted to the economic issues. The most frequently occurring words in it are: *'raport'* (report), *'ropa'* (oil), *'gaz'* (gas), *'miliard'* (billion), *'cena'* (price).

Overall, neutral (48.72%) and negative sentiment (45.37%) predominated in the text data collected. Texts classified as 'positive' comprised only 5.91% of the whole sample. For cluster No. 1 ('military' cluster), neutral sentiment also prevailed (54.14%), followed by the negative (41.17%) and positive (4.69%) ones. For the 'political' cluster No. 2 a similar situation was observed, but in this case the negative sentiment prevailed (50.31%), with slightly less neutral texts – 42.20%, and the least positive ones – 7.49%. As for the 'economic' cluster No. 3, it was dominated by neutral sentiment (85.79%), containing noticeably fewer negative posts and comments – 12.49%, as well as a very small number of positive texts – 1.72%.

Therefore, since Polish-speaking online discourse regarding Russia is characterised by a rather small share of positive sentiment (regardless of the subject of discussion), it is worth investigating the voting behaviour in the recent Sejm 2023 election, as well as its geographical aspects, to formulate, depending on the results of the analysis, an assessment of the prospects of Polish–Russian relations.

The voting data ($N = 31{,}495$) for this study were obtained from the website of the Polish National Electoral Commission (see Polish Parliamentary Elections, 2023). Subsequently, all observations for parties that did not pass the electoral threshold for the Sejm in 2023 were removed, and votes for the coalitions that made it to the parliament were converted into fractions by dividing the number of votes for a given party by the total number of valid votes in a particular polling station. Conceptually, the data analysis in this paper aims to categorise Polish polling stations into distinct groups, each sharing a similar distribution of votes for the five parties elected to the Sejm in 2023. This can be achieved by applying clustering algorithms to the data. While various clustering methods, such as k-means, DBSCAN, etc., are available, this article focuses on pattern analysis algorithms.

According to Aleskerov et al. (2006), pattern analysis allows researchers to group objects not solely based on the proximity of their values but rather on the structural proximity of the data itself, as well as to determine the number of clusters endogenously based on the results of solving a specific optimisation problem. Furthermore, the pattern analysis algorithm facilitates visualisation of the resulting clusters in a parallel coordinate system (Myachin, 2019), enhancing the interpretability of the obtained results. The visual representation of the data is quite valuable in case of studying electoral behaviour. It is also worth noting that pattern analysis was successfully implemented to cluster the election results of English, Scottish, and Welsh general elections (Aleskerov & Nurmi, 2008), as well as Finnish municipal (Aleskerov & Nurmi, 2008) and parliamentary elections (Nurmi & Meskanen, 2018).

Generally, there are three methods adopted from cluster analysis applicable to the issue of pattern construction: the method of logical taxon, k-means, and conceptual clustering. However, all of them either have considerable limitations and drawbacks, or (as for the former) have not yet been adequately tested on real data (Aleskerov et al., 2013). This paper delves into the relatively new methods of pattern analysis and relies on the ordinal-invariant pattern clustering because of the lack of an underlying assumption about the required number of groups in the final partitioning and the need to endogenously determine this quantity (Ahremenko & Myachin, 2019), as well as, more importantly, the necessity of clustering by the similarity of the structure of values, rather than by their magnitude (Aleskerov et al., 2006).

Ordinal-invariant pattern clustering is based on pairwise comparisons of complete weighted directed graphs. In this representation, the vertices correspond to the indicators, and the edge values denote the results of pairwise comparisons. Consider the example data represented by a set X, comprising some objects, each characterised by n indicators. The edge values e_i^{sj} (connecting nodes s and j) are calculated according to the following rules (Myachin, 2019, p. 142):

1) If $x_{is} > x_{is+1}$, then $e_i^{sj} = 2$;
2) If $x_{is} < x_{is+1}$, then $e_i^{sj} = 1$;
3) If $x_{is} = x_{is+1}$, then $e_i^{sj} = 0$.

The encoding of the x_i object is, therefore, calculated as follows:

$$c_i = \sum_{s=1}^{n-2} \sum_{j=s+2}^{n} 10^{j-(s+2)} e_i^{sj}.$$

If $c_i = c_k$, then x_i and x_k objects belong to the same ordinal-invariant pattern.

After applying the ordinal-invariant pattern clustering algorithm to a dataset of 31,495 observations (polling stations), 207 distinct patterns were derived. Nonetheless, it would be futile to describe every pattern, as, for instance, 92% of the whole data is captured in the 24 largest patterns, each containing more than 100 components (polling stations). Thus, I focus on the two largest 'pro-Russian' voting patterns, which include 80% of all polling stations that demonstrated a 'Russia-supporting' electoral behaviour and are referred to as pattern 11 and pattern 14 (once ranked by the number of components included). The results of the pattern analysis were visualised as the groups of piecewise linear functions in parallel coordinates plots, where the colour of each line reflects a specific polling station. Moreover, for each pattern, maps of Poland are presented, indicating how the polling stations included in the pattern are distributed across the country by voivodeships (provinces) and by powiats (counties or districts).

Pattern 11 (Figure 3) is distinguished by an exceptionally high level of support for Law and Justice. The party is followed by Confederation, Third Way, Civic Coalition and, finally, The New Left. The composition of this pattern is dominated by rural polling stations (604 out of 606 total), located in the southeast (in Polish Galicia) and in the east of Poland. It is also worth noting that polling stations from foreign countries were not captured in this pattern. Pattern 14 (Figure 4) is represented by 288 rural and only three urban polling stations. This pattern is also most prevalent in the region of Galicia in southeastern Poland, and it is distinguished by a high voter support for Law and Justice, followed by Confederation, Civic Coalition, Third Way, and The New Left, consequently.

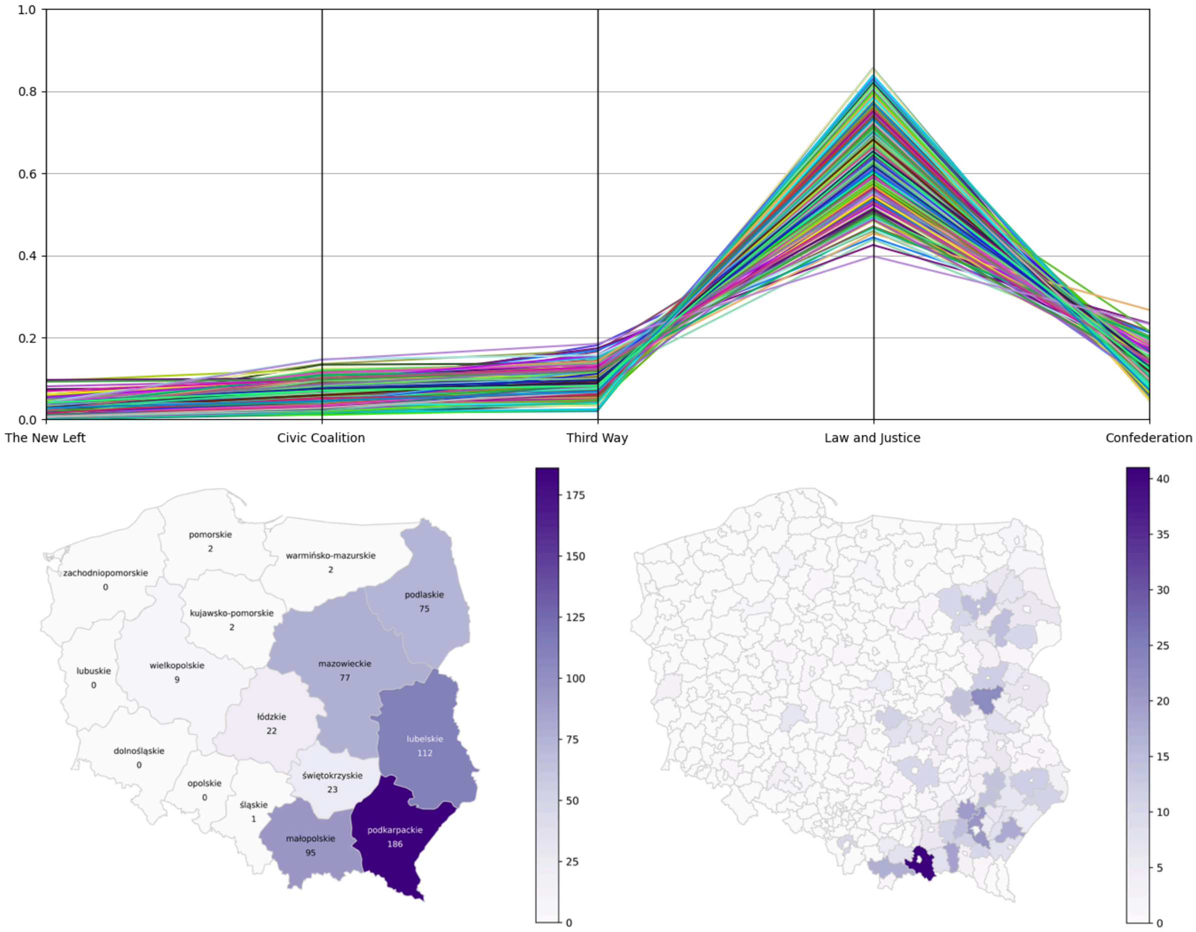

Figure 3. Piecewise linear functions of pattern 11 and maps of Poland, coloured according to the occurrences of polling stations from each voivodeship (left) and powiat (right) in the pattern

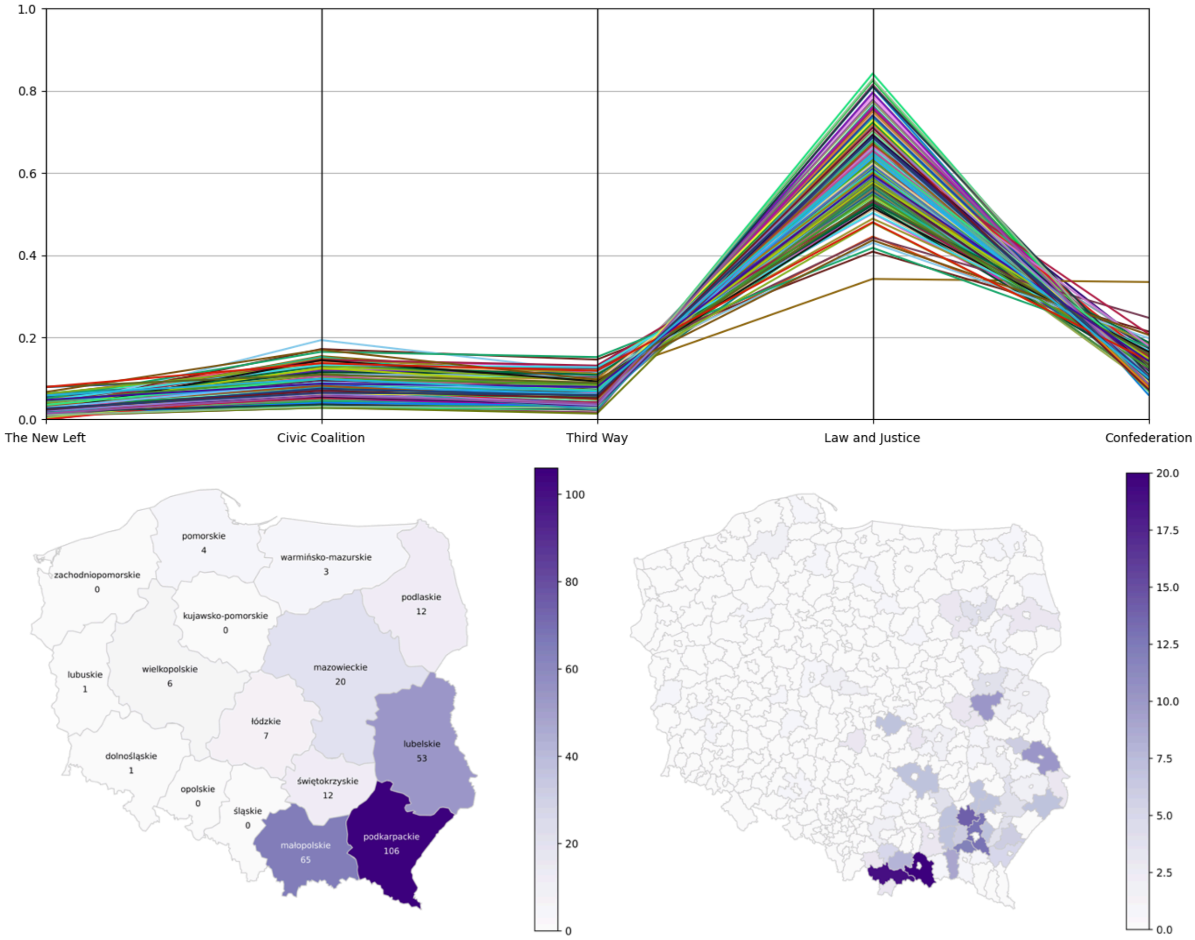

Figure 4. Piecewise linear functions of pattern 14 and maps of Poland, coloured according to the occurrences of polling stations from each voivodeship (left) and powiat (right) in the pattern

Hence, after applying the ordinal-invariant pattern clustering algorithm to the 2023 Sejm election data, no large patterns indicating a strong 'Russia-supporting' electoral behaviour were found. In turn, the largest patterns with the highest support for the 'pro-Russian' party of interest – Confederation – are also characterised by an even higher support for the openly anti-Russian Law and Justice. The geographical distribution of polling stations from pattern 11 and pattern 14 across Poland changes just slightly when all the 'pro-Russian' voting patterns, totalling 1,122 components, are considered. It is also worth noting that Confederation acquired the highest share of votes of all the parties elected to the 10th term Sejm in only three out of more than 30,000 voting precincts, so the 'pro-Russian' voting patterns included such polling stations where the party ranked first or second in terms of electoral support received. I find that these patterns are mostly represented in eastern and southeastern Poland (Figure 5), as in the case of patterns 11 and 14. Once again, partially confirming the initial hypothesis, most of the polling stations covered by the patterns are in Polish Galicia – *podkarpackie* (Subcarpathian) and *małopolskie* (Lesser Poland) voivodeships – although there are quite a few in *lubelskie* (Lublin) province.

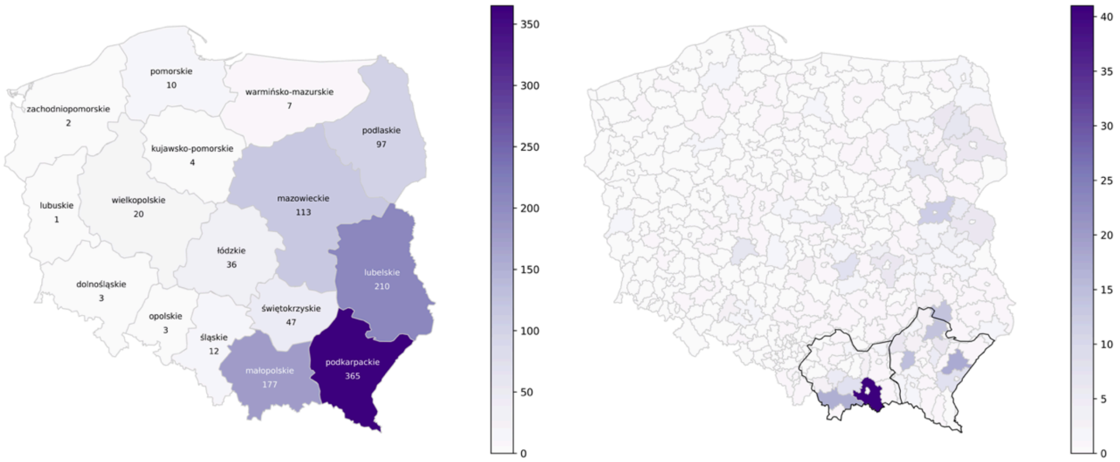

Figure 5. Maps of Poland, coloured according to the occurrences of polling stations from each voivodeship (left) and powiat (right) in all the ‘pro-Russian’ patterns

Note. The borders of *podkarpackie* (Subcarpathian) and *małopolskie* (Lesser Poland) voivodeships are bold on the map on the right.

Despite the fact that the highlighted voivodeships and powiats have the highest ‘pro-Russian’ orientation, the application of the pattern analysis methodology clearly demonstrates that the societal support for re-establishing Polish–Russian ties is not unequivocally strong even in these regions due to the high support for anti-Russian Law and Justice in them. However, it can also be assumed that many voters from *podkarpackie* (Subcarpathian), *małopolskie* (Lesser Poland), and *lubelskie* (Lublin) voivodeships were inclined to vote for Law and Justice not because the party’s manifesto reflects their attitudes towards Russia, but rather due to Law and Justice being the most popular conservative party in the country. The fact that more than 98% of polling stations in the ‘pro-Russian’ patterns are in rural areas may indicate that their population is characterised by low levels of involvement in the country’s politics and party system. As Okunev et al. (2021, p. 158) note, referring to the right-wing parties’ support in Poland, ‘it is easier for the electorate in rural areas to vote “as their neighbours vote” and not to study in detail the programmes of political parties’. Thus, a certain proportion of conservative voters (from the regions of interest) who support the normalisation of Polish–Russian relations may have simply voted for the largest right-wing party (Law and Justice), instead of supporting the only gaining-popularity Confederation, which may in fact better reflect their opinions on re-establishing diplomatic connections with Russia.

Thus, using ordinal-invariant pattern clustering to analyse data on the 2023 Polish Sejm election, as well as two text mining methods – agglomerative hierarchical clustering and sentiment analysis – to analyse the emotional orientations of Polish-language publications in social media and news, this study has outlined the vague prospects for Polish-Russian relations. On the one hand (at the national level), the electoral support of the only ‘parliamentary’ party in Poland openly neutral to Russia, the far-right Confederation, is rather weak. Moreover, only 5.91% of the sample of 133,192 texts in Polish concerning Russia were classified as ‘positive’. The picture is virtually unchanged when the sample is broken down by semantic clusters. In the ‘political’ cluster 7.49% positive sentiment was found, while in the ‘military’ and ‘economic’ clusters these shares were even lower: 4.69% and 1.72%, respectively.

On the other hand, the paper identified the Polish regions characterised by the strongest support for Confederation using the pattern analysis methodology. At most of the polling stations belonging to the 'pro-Russian' voting patterns this party ranks second behind right-wing anti-Russian Law and Justice in terms of electoral support, which indicates a high proportion of the conservative electorate in the highlighted regions of southeastern and eastern Poland, which is consistent with the literature suggesting that the east of Poland is generally prone to vote in favour of rightist political parties (Gulczyński, 2020). In fact, approximately 50% of 1,122 'Russia-supporting' polling stations are located in the *podkarpackie* (Subcarpathian) and *małopolskie* (Lesser Poland) voivodeships, supporting the initial research hypothesis. These regions, situated in the southeastern part of the country and occupying the historical territories of Polish Galicia, tend to provide the highest electoral support not only for the conservative parties but also for the political movements that adhere to the traditionalist ideology (Zagórski & Markowski, 2021; Zarycki, 2015), which is best expressed by Confederation among the parties represented in the Sejm.

Nevertheless, it is worth acknowledging the limitations of this research. Namely, the sample of collected posts and comments may include bot-generated texts, potentially skewing the results of the textual data analysis. Moreover, the research design suggests that residents of the regions in which the highest number of people voted for the Confederation party are the most loyal to the idea of re-establishing Polish-Russian relations. However, the same regions tend to exhibit an even stronger support for the anti-Russian Law and Justice, which has been clearly demonstrated by the selected pattern analysis method. This may lead one to question whether it is suitable to refer to them as 'pro-Russian', nevertheless, it may be considered reasonable given the peculiarities of Polish politics and the general negative public opinion of Russia (Fagan et al., 2023; Scovil, 2024). Further studies on the prospects of Polish–Russian relations should delve deeper into investigating the presence of Russia-supporting sentiment in Galicia. Beyond that, a similar methodology could be applied to analyze the electoral behaviour in different countries and support the findings with text mining methods.

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The Right to Privacy in the Digital Age
Право на приватность в цифровую эпоху

Abstract
The rapid advancement of digital technologies has fundamentally transformed the concept of privacy, presenting both unprecedented challenges and the emergence of new protective mechanisms. This article examines the evolution of the right to privacy from its philosophical foundations in the late 19th century to its current legal recognition as a fundamental human right. While historical evidence indicates that privacy has been valued across cultures, modern digitalization has intensified threats such as mass surveillance, data breaches, and the commodification of personal information. Despite these risks, legal frameworks like the GDPR and technical tools offer robust safeguards. The study explores key definitions of privacy by scholars such as Warren, Brandeis, Prosser, Bloustein, and Westin. It also analyses contemporary challenges, including the legal gaps in regulating emerging technologies. The conclusion reflects on whether modern society has more or less privacy than before, emphasizing that the answer depends on how privacy is defined.

Keywords: privacy; right to privacy; digital age; GDPR; data protection; human rights.

Technological progress poses numerous threats to the traditional way of life in society because it leads to substantial changes. Technologies can indeed influence human behaviour and shape social trends. For instance, the invention of the assembly line contributed to the rise of industrial society and the expansion of the working class. Nowadays the pace of technological advancement is incredibly rapid. News regularly reports on new inventions and upgraded smartphone models. The relentless pursuit of first-mover advantage may lead to unpredictable social consequences. Many scientists and business leaders are deeply concerned about these developments. For example, in 2023, the Future of Life Institute published an open letter calling on all AI labs to "immediately pause for at least 6 months the training of AI systems" (Future of Life Institute, 2023). The authors justified this by pointing to a lack of proper planning and governance, stating that "no one can understand, predict, or reliably control" powerful digital minds. The letter was signed by over 33,000 people, including Elon Musk and Steve Wozniak. Popular culture also reflects concerns about the potential dangers of technology. One of Netflix's most discussed series, Black Mirror, vividly depicts terrifying visions of a future where technology has overpowered humanity.

The digital age and its rapid changes challenge the legal system. Legislative processes are slow and require thorough consideration, creating a gap between the emergence of a technology and its regulation. In this context, legal scholars have revisited discussions on human rights, as these established norms can effectively address legal issues even before specific regulations are introduced. Their recognition and application help close gaps and prevent abuses.

One of the fundamental rights today is the right to privacy. It is a relatively new right, emerging only at the turn of the 19th century, but it is now enshrined in most legal systems and recognized internationally. The right to privacy serves as the legal foundation for protecting personal life information and data.

How does the digital age affect this right? On the one hand, with the rise of the internet and social media, our data has become a valuable source of information about our behaviour and habits. Some researchers argue that in the future, "everything will be or will contain personal data," turning data protection laws into "the law of everything" (Purtova, 2018). This makes people feel increasingly vulnerable. On the other hand, more tools are emerging to safeguard our data. Governments and non-governmental organizations are raising public awareness, making people more knowledgeable about privacy and protection. Stricter requirements are imposed on data processors, and penalties for violations in this field are increasing.

The *aim* of this article is to examine the right to privacy in the context of the digital age. To achieve this, we will analyse definitions of the right to privacy proposed by different researchers, explore its historical roots and evolution, identify the current state of this right, along with its modern challenges and protective mechanisms. Finally, we will attempt to answer the question: Do we have more or less privacy than our ancestors?

To begin with, it is necessary to define the right to privacy. Privacy is a complex and multidimensional concept. Therefore, different scholars define this right in various ways. It is worth beginning with the definition provided in the essay written by Brandeis and Warren (1890). Their work is considered the foundation of the right to privacy, as it was the first to introduce this concept. The authors conceptualized it as "the right to be let alone". According to them, the right to privacy protects a person's intangible property. The authors linked the emergence of this right to the invention of instantaneous photography and the widespread circulation of newspapers. Warren and Brandeis pointed out that existing legal tools aimed at protecting honour or intellectual property were unable to safeguard private thoughts and emotions. As an example, they described a situation where a personal letter could be opened and read by a stranger, yet the laws of that time did not provide for any liability for such actions. In the end, the authors specified certain limitations to the right to privacy. It should not hinder the dissemination of information of public interest or data disclosed with a person's consent.

Another definition was proposed by Prosser (1960). He analysed court rulings and identified four torts from which the right to privacy protects. These include:

- intrusion upon the plaintiff's solitude or into his private affairs;

- public disclosure of embarrassing private facts;

- publicity which places the plaintiff in a false light in the public eye;

- appropriation of the plaintiff's name or likeness.

Lately, Bloustein (1984) criticised the previous author, arguing that Prosser misunderstood the nature of the right to privacy. Bloustein elevated privacy to a matter of human dignity, framing it as protection of our "inviolate personality". He gave the example of a pregnant woman who has the right to give birth without the presence of third parties, as this reinforces her human dignity.

Other authors also offered their own definitions. For instance, Westin (1968) proposed understanding the right to privacy as "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others". He also identified four states of privacy: solitude, intimacy, anonymity, and reserve. Altman (1975) believed that the right to privacy was "the selective control of access to the self". He applied a dynamic analysis in this field and examined it from a new perspective. From his point of view, privacy constitutes a multiple system consisting of several units and capable of changing depending on five properties. Turkington (1990) wrote that privacy was the "ability to control access to one's information". Scoglio (1998) understood the right to privacy as "freedom to develop". Overall, these definitions show that the right to privacy is about autonomy, control, and dignity.

The next point we intend to make is that privacy is not a modern or exclusively western concept. It has deep historical roots across civilizations. There is clear evidence of privacy being valued and protected in various societies.

Ancient Greek philosophy provides one of the earliest conceptualizations. Aristotle (ca. 350 BCE/1998) made a fundamental distinction between the public sphere (polis) and private sphere (oikos). He established privacy as a recognized social concept. However, in classical Greek society, privacy was generally considered secondary to communal values.

Privacy also exists in Islamic tradition. The Quran explicitly commands believers "Do not spy on one another" (Haleem, 49:12). Islamic jurisprudence further developed this principle, emphasizing the sanctity of private spaces. This tradition created specific privacy norms regarding domestic life, personal correspondence, and individual reputation.

Finally, one of the most unexpected examples comes from the Tuareg tribe of North Africa. Their cultural tradition requires men to wear the tagelmust - a face veil that serves both practical and symbolic purposes. For the Tuareg, the veil represents personal dignity and privacy. The cultural significance is so profound that removing the tagelmust in public constitutes a severe violation of norms. It can have dire consequences, even death.

These examples prove that the desire for privacy is deeply rooted in human history. It has always existed. But the modern legal concept of privacy emerged only in the late 19th century. In 1890, Warren and Brandeis published their famous essay, which we have already mentioned. It laid the philosophical foundation. Their work encouraged a shift from viewing privacy as a social norm to recognizing it as a fundamental legal right with judicial protection (Wragg & Coe, 2023).

After the publication of this essay, the Supreme Court of Georgia heard the case Pavesich v. New England Life Insurance Co. The plaintiff sued the insurance company for using his name and photograph in an advertisement without permission. The court supported the position of Warren and Brandeis and, for the first time, officially recognized the right to privacy in a judicial decision, establishing a key precedent.

Nevertheless, legal practice remained inconsistent. In the well-known case Roberson v. Rochester Folding Box Co., the New York Court of Appeals ruled that using a person's image in advertising without consent did not constitute a legal violation. The reasons for that decision are the absence of specific legislation and lack of harm to the plaintiff. In response to this conflicting legal practice, the American Law Institute developed the Restatement of

Torts, which codified William Prosser's four privacy torts. From that point forward, courts in the USA began systematically recognizing and protecting the right to privacy.

Today this right is an integral part of both international and national legal frameworks. We can find it in the Universal Declaration of Human Rights. According to Article 12, "no one shall be subjected to arbitrary interference with his privacy, family, home, or correspondence (United Nations, 1948, Article 12). This declaration guarantees protection against such violations. Similarly, the European Convention on Human Rights contains comparable provisions in Article 8, stating that everyone has "the right to respect for his private and family life, his home and his correspondence" (Council of Europe, 1950, Article 8, para. 1). The same article outlines limitations to this right, allowing interference when it "is necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country" (Council of Europe, 1950, Article 8, para. 2).

The General Data Protection Regulation (GDPR) provides complex rules for personal data control, including a range of rights that constitute the right to privacy. All of them are listed in Chapter 3, such as the right of access by the data subject, right to rectification, right to erasure, right to restriction of processing, right to data portability, and right to object (European Union, 2016, Chapter 3).

In Russia, these principles are enforced through constitutional guarantees and specialized legislation in federal laws. To start with, Article 23 of the Constitution of the Russian Federation establishes that "everyone shall have the right to the inviolability of private life, personal and family secrets," as well as "privacy of correspondence, of telephone conversations, postal, telegraph and other messages" (Constitution of the Russian Federation, 1993, Article 23). Restrictions on these rights require a court decision. Article 24 states that the use of personal information without consent is prohibited (Constitution of the Russian Federation, 1993, Article 24).

More detailed provisions are contained in the Federal Law No. 152-FZ "On Personal Data." Article 5 establishes the principle of data minimization, meaning that "the content and scope of processed personal data must correspond to the stated purposes of processing" (Federal Law No. 152-FZ, 2006, Article 5). In other words, the data collected should not be excessive. Additionally, the Federal Law No. 149-FZ "On Information, Information Technologies and Information Protection" states that one of the fundamental principles is "inviolability of private life" (Federal Law No. 149-FZ, 2006, Article 3). These principles effectively safeguard privacy and guarantee the rights provided by the Constitution. Furthermore, the right to privacy can even be found in the Civil Code of the Russian Federation. In 2013, lawmakers introduced a new Article 152.2 titled "Protection of a Citizen's Private Life," which details actions that violate privacy rights. For example, the law states that violations may include "the use of personal details in works of science, literature, or art if such use infringes on the interests of the citizen" (Civil Code of the Russian Federation, 1994, Article 152.2). Additionally, the law specifies that public interest or voluntary disclosure by the citizen excludes the unlawfulness of the action.

Finally, the Constitutional Court of the Russian Federation has provided an interpretation of the term "private life." According to the Court, it is "a state-guaranteed opportunity to control information about oneself and prevent the disclosure of personal, intimate details" (Constitutional Court of the Russian Federation, 2005). The Court emphasized that this sphere of life should not be subject to state control unless the individual has violated the law, in which case the state must intervene to protect public interests. In another ruling, while defining the boundaries of privacy, the Constitutional Court stated that "only the individual has the right to determine which specific details related to their private life should remain confidential" (Constitutional Court of the Russian Federation, 2012). Thus, the scope of this right depends solely on the discretion of the individual.

Today, privacy faces numerous threats that undermine personal freedoms and security. One of the most pressing issues is invasive surveillance technologies. There are CCTV cameras equipped with facial recognition and social media platforms that track every move. In the digital world individuals are constantly monitored. Often without their knowledge or explicit consent. This creates a society where anonymity becomes nearly impossible.

Another problem is the alarming frequency of data breaches, which expose highly sensitive personal information to malicious actors. Every organisation might become a victim of cyberattacks. These breaches leave individuals vulnerable to exploitation.

The next problem is the shockingly low value people assign to their personal data. A social experiment conducted by Surfshark at a New York coffee shop depicts it to the full. People were offered free coffee and pastries in exchange for their personal data. According to the results of the experiment, 78% of respondents agreed to give away their data (Surfshark, 2023). It demonstrates that many people are not aware of the value of personal data and are ready to share it for a low price.

Finally, cybercrimes like identity theft can be extremely dangerous. Criminals exploit stolen data to empty bank accounts and even commit crimes in victims' names. The financial and emotional toll on affected individuals can be devastating, with some spending years trying to restore their identities and reclaim their stolen assets.

Privacy protection requires both legal and technical tools. Luckily, we have detailed regulations like GDPR that establish strict data protection standards.

On the technical side, various tools have been developed to help individuals safeguard their privacy in daily online activities. Encrypted messaging platforms such as Signal provide secure communication channels that prevent unauthorized access to private conversations. The Tor network offers anonymous web browsing. Secure email services like ProtonMail ensure confidential electronic correspondence through encryption methods. Virtual Private Networks (VPNs) help mask users' digital footprints and locations, while cryptocurrencies provide alternative payment methods that don't require disclosing personal data. Together these privacy-enhancing instruments help to defend the fundamental right to privacy in the digital world.

So, do we have more or less privacy today? This is a complex question. Technologically, we have less privacy because governments and corporations collect vast amounts of data. Nevertheless, legally privacy is more protected than ever with strong laws. People's awareness of privacy risks has grown, but convenience often outweighs concerns. In short, privacy today is both more regulated and more violated. Also, the answer depends on how we define privacy. If we mean the "right to be let alone," we have less privacy due to constant digital surveillance. But if we mean "control over personal information," modern tools give us more ways to manage our data than ever before.

In conclusion, the right to privacy emerged a long time ago and received a philosophical foundation in the late 19th century. Now regulators and courts worldwide recognize privacy as a fundamental right. Nevertheless, it faces a lot of challenges in today's world. Digitalization has created both risks and protections. Modern threats, such as mass surveillance and data breaches, make privacy protection far more complex. On the other hand, strong legal safeguards like GDPR and technical tools provide new ways to defend privacy. Overall, privacy today is both more violated by technology and better protected by laws, depending on how we define it.

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Metaphors in the Branding of American Celebrity Beauty Products: The Case of *Rare Beauty*, *R.E.M. Beauty*, *Fenty Beauty*, and *Haus Labs*

Метафоры в брендинге американской косметической продукции (на примере *Rare Beauty*, *R.E.M. Beauty*, *Fenty Beauty* и *Haus Labs*)

Abstract

The increasing prominence of celebrity-owned beauty brands highlights the need for a deeper understanding of the linguistic strategies used in their marketing discourse. Accordingly, this research aims to identify and analyze metaphors employed in the branding of four American celebrity beauty companies: Rare Beauty, R.E.M. Beauty, Fenty Beauty, and Haus Labs. The study explores the most frequently used types of metaphors and recurring structural patterns in product descriptions, with a focus on how these metaphors reflect the overall branding narrative. This research is grounded in Conceptual Metaphor Theory and applies the Metaphor Identification Procedure (MIP) as a primary analytical tool. The findings reveal frequent use of metaphors drawn from the domains of BUILDING, CLOTHES, and PERSON, alongside brand-specific categories that reflect each founder’s distinct identity and aesthetic. These results may be expected to offer a clearer framework for understanding metaphor use in this market segment and may contribute to future research in the domain of figurative language, advertising discourse, and branding within the beauty industry.

Keywords: conceptual metaphor theory; metaphors in marketing; Rare Beauty; R.E.M. Beauty; Fenty Beauty; Haus Labs.

Figurative language plays a central role in branding, offering a means to convey abstract ideas in ways that are more accessible, emotionally resonant, and memorable (Kövecses, 2010; Sobrino, Littlemore, & Ford, 2021). Among its various forms, metaphor is distinguished as a key lexical device used to structure consumer understanding and shape perception. Metaphors enable the communication of abstract concepts by mapping them onto more familiar, embodied experiences (Lakoff & Johnson, 1980). As such, they have become particularly valuable in marketing domains where emotional appeal and symbolic value are critical (Septianto, Pontes, & Tjiptono, 2022; Burgers et al., 2016).

In the case of the cosmetics industry, metaphorical language helps translate aesthetic ideals and aspirational values into product narratives (Forceville & Urios-Aparisi, 2009). With the rise of celebrity-owned beauty brands, this symbolic function becomes even more pronounced. These brands are often positioned as extensions of the celebrity's persona, blending personal identity with commercial messaging (McCracken, 1989; Davies & Chun, 2003). In this context, metaphor becomes a strategic tool not only for promoting products but also for reinforcing associations between the celebrity and their brand (Hoffmann & Novak, 2018; Ivantsiv, 2018).

This study aims to conduct a systematic analysis of metaphorical language in four American celebrity beauty brands: Rare Beauty, R.E.M. Beauty, Fenty Beauty, and Haus Labs. The focus lies on verbal metaphors found in product descriptions, with the goal of identifying and categorizing the metaphorical frameworks that underpin each brand's identity.

The research is guided by the following questions:

- What types of metaphors are most frequently used in the branding of American celebrity beauty products?
- What recurring metaphorical patterns can be identified across different celebrity beauty brands?

Metaphors are not only stylistic devices but also fundamental cognitive tools that allow individuals to comprehend abstract and complex concepts through more familiar, embodied experiences. This principle lies at the heart of the Conceptual Metaphor Theory (CMT), developed by Lakoff and Johnson (1980), who argue that metaphor is a pervasive and systematic feature of human cognition, shaping how we think, act, and communicate. According to their framework, metaphors function by mapping elements from a source domain (a concept that is particular and familiar) onto a target domain (a concept that is abstract and unfamiliar), enabling a richer and more intuitive understanding of the latter. For instance, "life is a journey" is a metaphor that conceptualizes life through the familiar schema of travel, complete with goals, obstacles, and paths.

Figurative communication, which includes the usage of metaphors, is frequently employed by marketing specialists to make the message more clear, persuasive and emotive (Sobrino, Littlemore, & Ford, 2021). There are two common reasons behind this phenomenon. The first is that the implicit nature of delivery created by metaphors allows the reader to interpret the message by themselves, increasing the "sense of ownership of the message" (Sobrino, Littlemore, & Ford, 2021, p. 14). Second, metaphors have been shown to incite an emotional response, indicating that they can be internalized and embodied.

Similar arguments can be found in the works of Kövecses (2010), who emphasizes that metaphor-based discourse enhances memorability, evokes emotion, and supports the narrative coherence of branding messages. Metaphorical language in advertising activates both cognitive and affective responses, helping products transcend their utilitarian function and acquire symbolic or personal significance.

Metaphor-driven communication becomes especially salient in the beauty industry, where products aim to convey notions of transformation, confidence, identity, and desirability

– concepts that are inherently abstract and culturally constructed. Advertisers often employ metaphors grounded in embodied experiences (e.g., "radiant glow"), conflict and mastery (e.g., "beauty arsenal"), or fantasy (e.g., "enchanting look") to dramatize product effects and enhance appeal (Forceville & Urios-Aparisi, 2009). These types of metaphors not only describe benefits but also create immersive narratives, anchoring products in affective and aspirational contexts. Moreover, Burgers et al. (2016) argue, these metaphorical frames increase persuasiveness, shape consumer attitudes, and build stronger brand associations.

Xu (2014) identifies prevalent metaphors in cosmetic advertisements, such as SKIN/HAIR CARE is WAR, where products are depicted as weapons combating imperfections, and EYE/LIP CARE is a SENSATIONAL OBJECT, portraying cosmetics as sources of sensory pleasure. These examples illustrate how metaphors not only enhance the appeal of beauty products but also construct narratives that position the products as essential tools in consumers' personal transformation journeys.

Landau, Zhong, and Swanson (2018) further elaborate on the impact of metaphoric messaging in marketing, asserting that metaphors can shape consumer attitudes and behaviors by aligning product attributes with familiar experiences. This alignment fosters a deeper emotional connection between the consumer and the brand, enhancing brand recall and loyalty.

When applied to celebrity beauty brands, the use of metaphors takes on additional layers of meaning. Earlier research by Hoffmann and Novak (2018) has demonstrated that brands often leverage metaphors that align with the public personas of their founders, creating a cohesive brand narrative that resonates with their target audience. Such personal branding enhances consumer trust and fosters perceived authenticity, particularly when metaphorical language aligns closely with the celebrity's image.

One common example is the metaphor "brand is a person," which allows the brand to embody characteristics associated with the celebrity, such as authenticity, empowerment, or creativity (Davies & Chun, 2003). Through this personification, the brand fosters a sense of intimacy and trust between itself and the consumer.

Expanding on the role of metaphor, Ivantsiv (2018) discusses metaphorical modeling in corporate image development, highlighting metaphors like BUSINESS is ART, which frame the brand's offerings as creative masterpieces. This is particularly relevant to the beauty industry, where aesthetic appeal and artistic expression are central to product value. By adopting such metaphors, celebrity beauty brands position their products not merely as cosmetics but as extensions of an artistic vision, enhancing their allure and market differentiation.

Overall, what has been observed is that, while the persuasive and cognitive functions of metaphor in general advertising contexts are well documented in the existing literature, a more focused examination of metaphor use within celebrity-owned beauty brands appears to remain underexplored.

Addressing this gap, the present study undertakes a systematic analysis of the metaphorical expressions used in the product descriptions of four prominent American celebrity beauty brands.

The insights derived from this study may contribute to both theoretical and practical domains. From a theoretical perspective, it could expand the body of literature on figurative language in commercial discourse, particularly within celebrity-centered advertising. Practically, the findings may offer marketing specialists a deeper understanding of how metaphors can be strategically employed to align brand narratives with celebrity personas, enhancing authenticity, trust, and consumer loyalty. Furthermore, this research might provide a foundation for future studies examining the effects of metaphor use in celebrity-driven advertising on consumers' perception of the product and the concept of beauty itself.

The analysis focuses on four American celebrity beauty brands: *Rare Beauty* by Selena Gomez, *R.E.M. Beauty* by Ariana Grande, *Fenty Beauty* by Rihanna, and *Haus Labs* by Lady Gaga. They were selected based on the shared traits of their founders. The four are internationally renowned American female performers of a similar age who gained fame through music, acting, and/or modeling. Thus, their global recognition has translated into their beauty brands, which are now also widely known and have been ranked among the top celebrity beauty brands by publications such as *Vogue* (Scott, 2024) and *ELLE* (Mitchell, 2025).

Information provided on the official websites served as the sole source of data for the metaphor collection. To narrow the sample, the scope of research was limited to makeup items, excluding all skincare items and makeup tools. After observing the range of makeup products across the brands, they were split into the following three categories: face, eye and brow, and lip.

The official descriptions of the products (excluding the name of the product and the shades they are available in) that fall within the scope of this research in the assigned categories were utilized as raw data. Then, to find metaphors in the collected dataset, the Metaphor Identification Procedure (MIP) was employed (Pragglejaz Group, 2007). In the process of reading the texts of product descriptions, the basic meaning of each lexical unit was established with the help of dictionaries such as Oxford (*Oxford Learner's Dictionaries | Find Definitions, Translations, and Grammar Explanations at Oxford Learner's Dictionaries*, n.d.) and Cambridge (*Cambridge Dictionary | English Dictionary, Translations & Thesaurus*, 2025). Then, this basic meaning was compared to the contextual meaning of each lexical unit. In the case of any disparities, the authors checked for a conceptual connection between the two meanings to confirm the usage of metaphor. Such units were highlighted, and the source and target domains of the metaphor were identified.

For further analysis, all the discovered cases of metaphor usage were transferred to a spreadsheet table. Then, relying on the identified source and target domains of the metaphors, it was possible to group them into categories. These categories will be discussed in more detail in the following section of this paper.

As a result of data collection and processing, 667 cases of metaphor usage have been identified across the four brands.

As the number of products and the length of textual descriptions vary greatly across the chosen brands, it is important to calculate the percentage of the overall text that is occupied by metaphorical language. Having done that, it becomes plausible to compare the density of metaphor usage across the four brands. As the findings demonstrate (see Table 1), R.E.M. Beauty leads in metaphor usage, with metaphorical language being present in almost 9 percent of the analyzed texts. It is followed by Rare Beauty and Haus Labs, with 6.68% and 6.36%, respectively. Fenty Beauty shows the lowest metaphor density with 5.62%.

	Number of metaphors	**Number of products**	**Number of words**	**Percentage of metaphors**
R.E.M. Beauty	223	32	2514	8.87%
Rare Beauty	206	32	3086	6.68%
Haus Labs	63	16	991	6.36%

Fenty Beauty	175	42	3115	5.62%

Table 1. Summary of Findings

According to the target domains of the identified metaphors (see Chart 1), five overall categories have been distinguished. The most numerous one (72%) includes those metaphors that aim to refer to the concept of makeup itself. This category can be subdivided further into three subcategories based on the target domain: MAKEUP, MAKEUP PRODUCT, and MAKEUP LOOK. The next category, occupying 21% of the total, covers the core characteristics of makeup and makeup products. More precisely, those are TEXTURE (including liquids), COLOR (including light or shine), and SCENT. 2% of the metaphors are orientational ones while 1% is concerned with the parts of the human face that come into direct contact with makeup products (for example, lips, skin, etc.). The remaining 4% represent cases of metaphors which do not form a coherent category on the basis of a shared target domain and, therefore, have been assigned the category of 'other.' The target domains in the dataset are described with the help of 53 distinct source domains (see Chart 1).

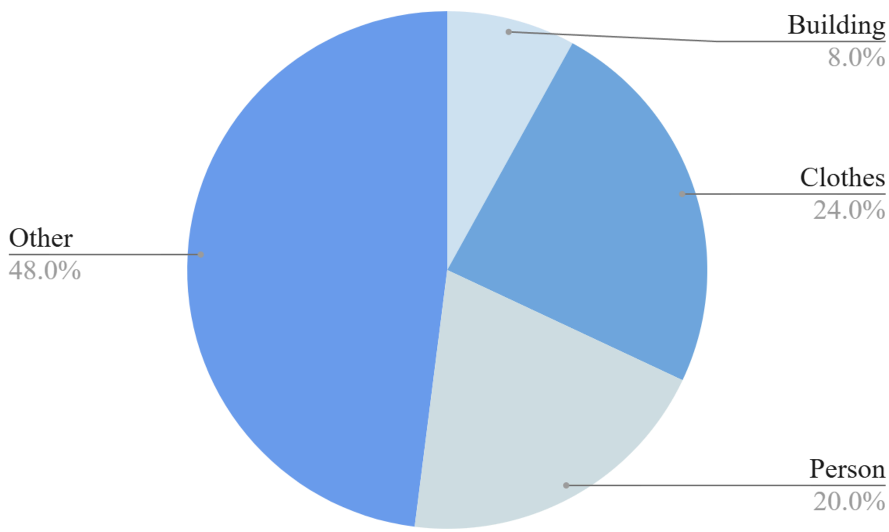

Chart 1. Source Domains of Identified Metaphors

<u>MAKEUP as Target Domain</u>

In the dataset, MAKEUP occurs 285 times as the target domain of metaphors across the four brands. There are 22 source domains with the help of which the metaphors of makeup are constructed.

The most prevalent one across the four brands is the source domain of BUILDING. In this case, makeup is viewed as a construction. It is something that can be built. The most frequent metaphorical collocations in this group are "buildable formula," "buildable coverage," "buildable color," and "buildable finish." They appear to be equally popular throughout the texts of the product descriptions.

Another popular source domain is clothes. Metaphors in this group attempt to portray makeup as something people can wear (1-2).

(1) Packed with long-lasting pigments for all-day wear that won't fade. (*Soft Pinch Liquid Contour | Rare Beauty*) – MAKEUP is CLOTHES
(2) A 2-in-1 stick that lays down creamy, comfy color in a naturally luminous, long-wearing finish. (*Blush & Lip Stick | R.E.M. Beauty*) – MAKEUP is CLOTHES

Another frequently encountered word in this category is "to layer" (3). Only here it refers to layers of makeup rather than pieces of clothing.

(3) This longwear cream-to-powder highlighter stick is weightless, blendable, and LIVES to be layered. (*Match Stix Shimmer Skinstick | Fenty Beauty*) – MAKEUP is CLOTHES

The third most numerous group here includes metaphors that liken makeup to a game or a play. This group of metaphors is most frequent in the descriptions of Fenty Beauty products and appears to be more sustained as well (4-5).

(4) A hydrating multi-use stick that plays by your rules. (*Match Stix Color Adaptive Cheek + Lip Stick | Fenty Beauty*) – MAKEUP is a PLAY/GAME
(5) Meet the only MVP (most valuable player) you can trust with your brow game. (*Brow MVP Ultra Fine Brow Pencil & Styler | Fenty Beauty*) – MAKEUP is a PLAY/GAME

MAKEUP PRODUCT as Target Domain

The most numerous metaphors in this subcategory are those that aim to personify the beauty product (6). This is, first and foremost, realized through the usage of verbs that describe actions normally performed by living creatures.

(6) Killawatt Freestyle Highlighter was born to reflect your every mood. (*Killawatt Freestyle Highlighter | Fenty Beauty*) – MAKEUP PRODUCT is a PERSON

One more popular group of metaphors that is represented by just one word is that which sees beauty products as transport that delivers certain effects and results (7). In total, it appears 35 times (14 of which come from Haus Labs texts).

(7) This proprietary formula delivers ultra comfortable, longwear performance. (*Triclone Skin Tech Medium Coverage Foundation | Haus Labs*) – MAKEUP PRODUCT is a TRANSPORT

Another group of metaphors in this subcategory is that which links beauty products to machines through the usage of two expressions (8-9). They are "fueled by" and "powered by." These metaphors have only been found in the descriptions of R.E.M. beauty, Haus Labs, and Fenty Beauty.

(8) Fueled by our innovative InvisiFlex Shield for comfy protection, this ultra-fine mist makes makeup more resistant to sweat, humidity, transfer + water. (*You Mist Makeup-Extending Setting Spray | Fenty Beauty*) – MAKEUP PRODUCT is a MACHINE

(9) Powered by ultra-hydrating jojoba seed oil and antioxidant-rich grapefruit extracts, this multitasking innovation glides onto skin and melts upon application. (*Blush & Lip Stick | R.E.M. Beauty*) – MAKEUP PRODUCT is a MACHINE

TEXTURE as Target Domain

The target domain of TEXTURE occurs 131 times in the collected data. The most widespread means through which this group of metaphors is expressed involves the process of transforming nouns into adjectives with the help of the suffix -y. There are 18 such adjectives: airy, cakey, muddy, creamy, dewy, silky, chalky, ashy, cushiony, buttery, velvety, juicy, inky, feathery, waxy, pillowy, peachy, flaky. In all these cases, the adjectives attempt to point to some qualities of the product's texture by comparing them to the more familiar objects or substances (10-11).

(10) Infuse cheeks and lips in silky hydration and a natural-looking flush that locks on and lasts long. (*Blush & Lip Stick | R.E.M. Beauty*) – TEXTURE as SILK
(11) A naturally sculpted look that's never muddy. (*Soft Pinch Liquid Contour | Rare Beauty*) – TEXTURE as MUD

Orientational Metaphors

A small portion of the dataset (2%, or 9 cases) is occupied by orientational metaphors where UP is connected to something good (12), DOWN to something bad (13), and FORWARD to something innovative (14).

(12) Take lashes to sky-high heights with a jet-black lengthening mascara that lifts, volumizes & separates without flaking. (*Lengthening Mascara | R.E.M. Beauty*) – GOOD is UP
(13) Nourishing hydration that won't weigh you down**.** (*Lip Soufflé Matte Lip Cream | Rare Beauty*) – BAD is DOWN
(14) A unique science-forward, skincare-infused formula that combines the hydration of a lip oil, cushion of a balm, volumizing effect of a plumper and high shine of a gloss. (*PhD Hybrid Lip Glaze | Haus Labs*) – INNOVATION is FORWARD

Metaphors Involving Parts of the Face

The smallest identifiable category of metaphors (1%, or 7 cases) in the analyzed data deals with the parts of the face that come into contact with makeup. They are brows, lips, and skin. In 6 of the 7 examples in our data, these parts are personified (15-16).

(15) A hydrating lip balm with a kiss of dewy, buildable color that looks and feels so good your lips will thank you. (*With Gratitude Dewy Lip Balm | Rare Beauty*) – LIPS as a PERSON
(16) The curated, all-star shade lineup has matte + shimmer shades for all skin tones to flaunt. (*Fenty Cheeks Suede Powder Blush | Fenty Beauty*) – SKIN as a PERSON

The one example involving brows likens them to arches (17).

(17) The velvety soft pencil includes a built-in sharpener and spoolie to take your arches from full and feathery to dramatic and daring. (*Brow Pencil | R.E.M. Beauty*) – BROWS as ARCHES

This study has analyzed metaphors within the context of the branding strategies of four American celebrity beauty brands: REM Beauty, Rare Beauty, Fenty Beauty, and Haus Labs. Through the examination of 122 product descriptions, it identified 667 instances of metaphor usage. The findings reveal that, while these brands share common metaphorical patterns, primarily drawing on the source domains of BUILDING, CLOTHES, and PERSON to conceptualize makeup and beauty products, each brand also employs unique metaphorical categories that may reflect its founder's distinct identity and aesthetic. This supports the idea that celebrity beauty brands are not generic but instead use branding strategies that align with their creator's persona and style.

These insights may contribute to a broader understanding of metaphor use in marketing, particularly within the American celebrity beauty industry, and may offer valuable implications for branding and advertising research. However, the study is limited by the potential subjectivity of metaphor interpretation, the selective case study approach, and the lack of experimental testing with regard to the effects of metaphor usage in beauty advertising on consumer perception. Future research could address these gaps by examining a larger sample of celebrity beauty brands and conducting empirical studies to assess how metaphors influence consumer engagement and brand perception. Such investigations would further shed light on the role of figurative language in shaping consumer experiences in the beauty industry.

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Joy in a Box: How Vkusvill Prazdnik Can Own the Gift Box Market
Коробка с эмоциями: путь Вкусвилл Праздник к лидерству в сегменте подарочных боксов

Abstract
This article examines the strategic marketing approach of “VkusVill Prazdnik” to strengthen its position in the rapidly growing and competitive gift box market. It explores how the brand can leverage digital tools, personalization trends, and eco-conscious values to differentiate itself and drive customer engagement across B2C segment. Based on survey data and market analysis, the study identifies key success factors, such as product quality, visual appeal, delivery convenience, sustainability, and perceived value. Special attention is given to segmentation, targeting, and positioning (STP) strategies for diverse consumer groups—from professionals and gift-givers to younger audiences and online shoppers. The article outlines a tailored marketing mix with an emphasis on flexible pricing, enhanced customization, and omnichannel distribution, including physical stores and e-commerce platforms. It also evaluates push and pull promotional tactics, including influencer partnerships, targeted advertising, SEO. The proposed roadmap offers actionable insights to help “VkusVill Prazdnik” increase brand awareness, improve customer loyalty, enhance digital presence, and capture a larger share of the gift box segment through innovative and customer-centric initiatives.

Keywords: gift marketing; customer segmentation; digital promotion; product customization; brand positioning; VkusVill Prazdnik.

In an increasingly competitive and dynamic marketplace, the development of an effective marketing strategy is both an art and a science. The primary goal of such strategies is to enhance a company’s presence, attract new customers, and solidify loyalty among existing ones, ultimately increasing market share. This article examines the core theoretical principles underlying marketing strategy development, offering insights applicable across industries.

At the heart of any marketing strategy lies a deep understanding of the market. This encompasses customer needs, competitive positioning, and external influences like economic trends, technological advancements and cultural shifts. Companies must continuously analyze these factors to adapt their strategies and seize emerging opportunities.

The STP (Segmentation, Targeting, and Positioning) framework provides a structured approach to defining and reaching the target audience:

- **Segmentation** involves dividing a heterogeneous market into smaller, homogeneous segments based on demographic, geographic, psychographic, or behavioral criteria. Effective segmentation ensures that marketing efforts address the specific preferences and needs of diverse customer groups.
- **Targeting** is the process of evaluating and selecting one or more segments to serve. This decision is based on the attractiveness and compatibility of the segment with the company's objectives and capabilities.
- **Positioning** focuses on creating a unique and desirable perception of the product or service in the minds of the target audience. This involves crafting a distinctive value proposition that sets the brand apart from competitors.

A successful strategy integrates the marketing mix—product, price, place, and promotion—to meet consumer expectations:

1. **Product:** This encompasses not only the core product but also the augmented aspects, such as quality, design, packaging, and customer experience.
2. **Price:** Pricing strategies—such as penetration pricing, skimming, or value-based pricing—are used to reflect the perceived value and foster brand appeal.
3. **Place:** Distribution strategies focus on ensuring product availability at the right location and time, with an emphasis on convenience.
4. **Promotion:** This includes advertising, sales promotion, public relations, and digital marketing.

Customer Journey Mapping (CJM) is a strategic tool that helps businesses visualize and optimize the end-to-end customer experience. It identifies key touchpoints, pain points, and moments of delight across all interactions with a brand. The key phases—Search, Choice, Purchase, Retention, and Loyalty—each play a crucial role in shaping customer perception and long-term engagement.

Digitalization has redefined marketing strategies across industries. Key areas include:

- **Search Engine Optimization (SEO)** and content marketing for increasing online visibility.
- **Social media platforms** for engaging audiences and driving conversions.
- **Customer relationship management (CRM) systems** for fostering long-term engagement. Additionally, the use of augmented reality (AR) and virtual reality (VR) enhances customer experiences by offering immersive interactions with products or services.

As a researcher and developer of marketing strategies, my goal is to enhance the market share of "VkusVill Prazdnik", a division of the VkusVill chain specializing in customizable gift boxes. This project delves into designing a tailored marketing approach to address evolving market demands, consumer behaviors and competitive dynamics, ensuring the company strengthens its foothold in the burgeoning gift box industry.

"VkusVill Prazdnik", launched in 2020, provides turnkey solutions for celebratory events, including bespoke gift boxes. Positioned at the intersection of sustainability, personalization and quality, the company targets both B2C (70% of revenue) and B2B (30% of revenue) audiences. The brand operates in a growing, fragmented market marked by rising consumer demand for unique and eco-conscious gifting solutions. This empirical study focuses on identifying growth opportunities, refining customer engagement, and crafting a robust marketing strategy to bolster market presence.

An in-depth market analysis revealed three critical trends shaping the gift box segment:

1. **Eco-conscious consumption**: Consumers increasingly prefer environmentally friendly products. Sustainable packaging and ethical sourcing align perfectly with VkusVill's core values.

2. **Personalization**: Buyers value bespoke gifting options that cater to individual preferences, emphasizing the importance of flexible configurations and unique product offerings.
3. **Digital dominance**: With up to 70% of gift box purchases projected to occur online by 2027, the brand must optimize its online channels for maximum reach and usability.

These trends form the backbone of the strategy, ensuring that VkusVill stays ahead of the curve in a competitive landscape.

At this point, let us direct our attention to the **product** strategy.

The Analysis of gift boxes is based on Kotler's five-level product model:

1. **Potential product**: Personalization of boxes (for example, by occupation or interests); Temporary limited editions (for seasonal holidays).

2. **Augmented product**: Unique design solutions for packaging, the addition of original products that are difficult to find separately, convenience of choice, ease of delivery.

3. **Expected product**: Attractive appearance: Beautiful eco-friendly packaging, high-quality products inside.

4. **Generic product**: A set of high-quality products (food and drinks) combined in a gift box.

5. **Core benefit**: The opportunity to easily and stylishly congratulate loved ones or colleagues, conveying positive emotions through an original gift.

I conducted a survey with 37 people in order to find out what the most important factors for them when choosing gift boxes and whether they are ready to buy our product.

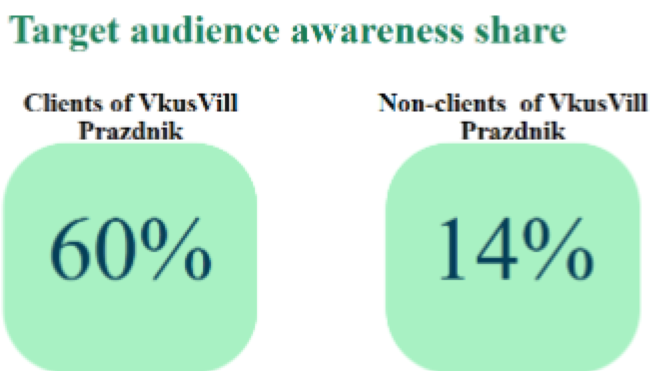
The most important factor when choosing a gift box turned out to be quality production, followed closely by appearance and packaging, indicating that aesthetics and craftsmanship play a key role in decision-making. Price-quality ratio and simplicity and speed of delivery are also significant considerations, suggesting that customers value both affordability and convenience when purchasing gift boxes. The least important factor turned out to be environmental friendliness and usefulness, indicating that while sustainability is a growing concern, it is not a top priority in gift box selection compared to other aspects.

The survey results show that the most important factors for packaging improvement are attractiveness (35%) and customization (34%). Price reduction (6%) and closed packaging (10%) are less significant for consumers.

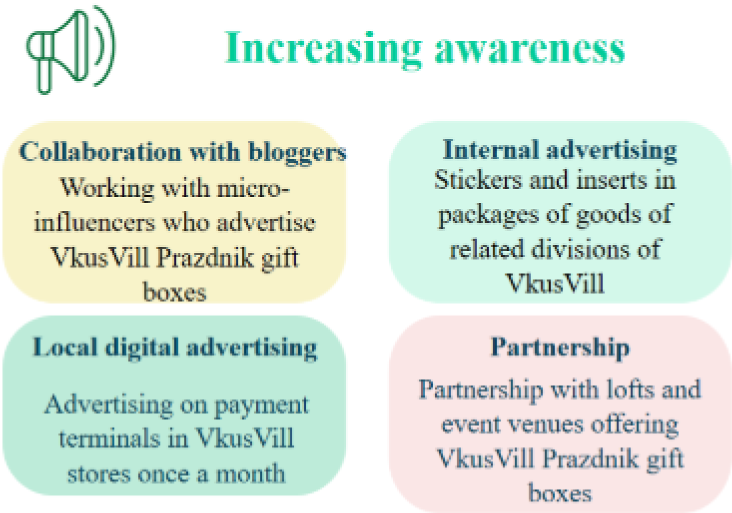
At this stage, let us concentrate on the **positioning** of “VkusVill Prazdnik”.

“VkusVill Prazdnik” is a brand offering environmentally friendly, personalized and high-quality gift sets. The uniqueness of the company lies in its concern for the environment and the provision of customized solutions for consumers. I suggest using a suitable motto “Bring joy to your loved ones with eco-friendly, high-quality and personalized gift sets”.

The survey data reflect one of the weaknesses of the product “Gift boxes” “VkusVill Prazdnik” - low awareness of the target audience about the product.



Picture 1. Share of target audience awareness (clients and non-clients of “VkusVill Prazdnik”)



Picture 2. Suggestions on how to raise awareness about the product “Gift boxes” from “VkusVill Prazdnik”

The main goal is to increase the “VkusVill Prazdnik” market share in the gift box market by 5%, as well as retain existing customers.

Segmenting the market revealed several promising customer personas, including:

- **Professionals aged 31–45**: This segment seeks premium-quality, aesthetically appealing products and values convenience.
- **Gift-givers**: Often men look for meaningful, memorable presents for their partners.
- **Young enthusiasts**: Tech-savvy individuals who prioritize customization and modern aesthetics. Each group has distinct motivations and challenges, which the strategy addresses through tailored messaging and product innovations.

The most appropriate marketing strategy would be a guerrilla attack.

1. Main marketing goal: capture a modest share of repeat/replacement purchases in several market segments.

2. Market characteristics: a relatively heterogeneous market with many larger segments.

3. Competitor characteristics: several competitors have relatively strong resources.

4. Company characteristics: the company has relatively limited marketing resources and competencies.

The company will increase sales in the following segments: professionals, people looking for gifts to thank, and men looking for gifts for their partners by raising awareness of the existence of its products, in-depth study of needs, increasing consumer loyalty and encouraging repeat purchases.

At this stage, let us turn our focus to the **pricing** strategy.

As a result of the survey, 79.2% of the participants indicated that the “price-quality” factor has a high degree of importance, while only 3% noted that this criterion is minor. This result shows that customers, when choosing products, pay attention to the conformity of the quality of the product and its value to its price. In this context, the pricing strategy should be differentiated and based on the value of the product.

The main method of pricing is the perceived value of the product. The price of a box is determined based on the quality and uniqueness of the products, the composition, the presentability of the packaging and competitiveness.

It is necessary to choose a pricing Strategy Based on the 3C Model.

Price Differentiation by Segment

1. **Premium Boxes:**
- For example, the “Large Gift Box” (4,700 rubles as of July 15th, 2025) is priced above the average competitor segment but below premium players.
- The focus is on an exclusive assortment and personalization (e.g., adding a personalized engraving).

0. **Mid-Range Segment:**
- For example, the “Chocolate & Tea Box” (3,700 rubles as of July 15th, 2025). The price is competitive compared to similar offerings.

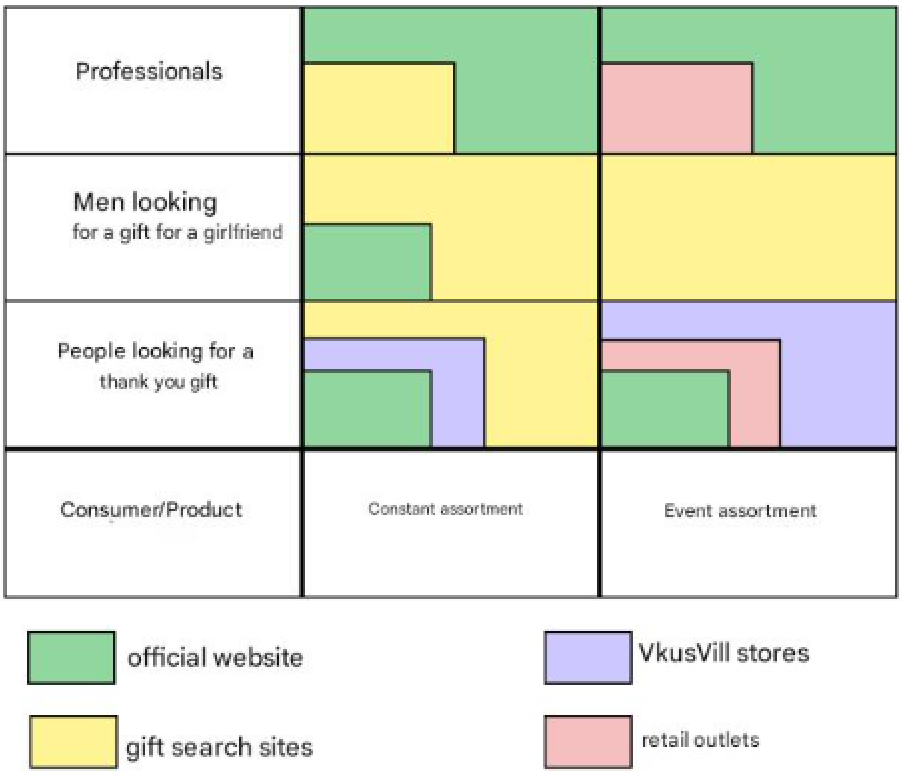
0. **Budget Boxes:**
- For example, the “Gingerbread Constructor Box” (2,300 rubles as of July 15th, 2025). The price falls within the lower range, making it suitable for families with children.

Expanding the Price Range
- Introducing a line of “mini-boxes” priced between 1,500–2,000 rubles as of July 15th, 2025 (with minimal content).
- Launching premium limited-edition sets (5,000–7,000 rubles as of July 15th, 2025) for high-end gifts.

Now, let us consider the strategy concerning the **place.**

As a result of the survey, 59.7% of participants indicated that the factor of “simplicity and speed of delivery” is of high importance, while only 7.5% noted that this criterion is of low importance.

This result shows that when choosing products, customers primarily evaluate the time and convenience of the receiving process. In this context, distribution strategies should be adapted to meet customer expectations.



Picture 3. Distribution map for “Gift boxes” from “VkusVill Prazdnik”

To effectively enhance the brand’s presence and customer experience, the following actions are recommended:

Official website:

- Improve the official website for a more convenient and intuitive search for gift boxes.
- Add gift box videos to the official website.
- Implement the ability to customize a gift box.

Gift search sites:

- Partner with dealer websites specializing in gifts and gift boxes.

VkusVill stores:

- Place gift boxes in strategic locations: near cash registers, payment terminals, and near products related to the theme of the boxes.

Retail outlets:

- Display event-based assortments in retail locations with high foot traffic, such as shopping malls.
- Showcase event-based assortments on stands in VkusVill stores.

Let us now turn our attention to the **promotion** strategy.

To effectively promote VkusVill gift boxes, a combined strategy should be used, including both push and pull methods. This approach will not only help attract a new audience but also significantly increase brand awareness, as well as help build long-term customer loyalty. First, “VkusVill Prazdnik” can use push methods that will create initial interest and quickly attract attention to the product, then pull methods to maintain this interest and turn one-time purchases into regular ones.

Push methods include:

- **Advertising at self-service checkout counters**: Customers standing at the self-service checkout VkusVill see a bright advertisement with a QR code that offers a discount on the first order. By scanning the code, they instantly go to the VkusVill website and receive a personal discount on their first order.
- **Flyers with QR codes**: When making any purchase, each VkusVill customer receives an advertising flyer with a QR code (taking them to the website) and a promo code for the discount on the first gift box.
- **Multifunctional application**: The VkusVill mobile application provides the convenience of push-notifications about personal discounts, promotions, and reminders about items added to the shopping cart.
- **Micro-influencer advertising**: Partnering with micro-influencers ensures reaching a new audience, their personal recommendations increase confidence in the product, and exclusive promo codes, only for their audience, stimulate sales.
- **Targeted social media advertising** (wisely): Instead of a broad campaign, it is advisable to prioritize narrow targeting and develop small but very accurate advertising campaigns targeting specific interests and demographics (age, gender, location, interests in gifts, healthy lifestyle, etc.). Test different creatives and advertisements to determine the most effective ones.

Pull methods include:

- **SEO promotion and website improvement**. Optimizing the website for keywords such as “gifts”, “gift sets”, “corporate boxes” and “VkusVill gifts” will allow “VkusVill Prazdnik” to take a leading position in search engines. Improved navigation will make the site more intuitive, and high-quality photos and detailed descriptions of the boxes will create a festive atmosphere and inspire customers to shop.
- **Active maintenance of social networks.** Regular maintenance of social networks helps to increase brand awareness and ensures effective interaction with the

audience. Our constant presence in the media space allows us to inform consumers about gift boxes, new promotions, and new products.

- **Creating a personal account** for each customer will allow “VkusVill Prazdnik” to track orders and send personalized offers. This will improve the user experience and increase brand loyalty.
- **The presence on marketplaces and similar platforms**, for example, Flowwow, will expand the sales market and attract customers who prefer online shopping. This will provide additional channels for sales and increase audience reach.
- **Developing seasonal offers** timed to coincide with the holidays will help stimulate demand and attract attention to products during certain time periods, which will boost sales.

To stand out, VkusVill can leverage its competitive advantage in natural, high-quality products, eco-friendly branding, and adaptability. Offering unique combinations like thematic or recipe-based boxes will cater to niche preferences while reinforcing the brand's value proposition.

Here I demonstrate the Customer Journey Map and the degree of customer satisfaction before introducing our initiatives.

Picture 4. The Customer Journey Map for “Gift boxes” from “VkusVill Prazdnik”

Crafting a seamless and engaging customer journey is essential to build long-term loyalty. Current pain points, such as limited customization options, high delivery costs and a lack of brand awareness, hinder VkusVill’s ability to captivate its audience. Addressing these involves:

1. **Improved Website Navigation**: A user-centric redesign of the website would feature clear product categories, video previews, and intuitive checkout processes.
2. **Flexible Product Customization**: Allowing customers to create or modify box contents independently without relying on operators can increase satisfaction.
3. **Streamlined Delivery**: Offering same-day delivery options and transparent tracking would ensure faster and more reliable service.

Now it is important to evaluate which segments specific offers are most relevant for; in other words, to create a **marketing mix** tailored to each segment.

Picture 5. The segments of the target audience for “Gift boxes” from “VkusVill Prazdnik”

Table 1.

A marketing mix for each segment of the target audience for “Gift boxes” from “VkusVill Prazdnik”

<table>
<tr><th>P-Product</th><th>P-Price</th></tr>
<tr><td>Product improvement:
the packaging should be changed to make it more attractive, lighter, and cheaper (relevant for segments 1 and 3)
the ability to customize the contents of the boxes should be added (relevant for segments 1 and 3)
Assortment:
limited series of boxes for major holidays should be developed (relevant for segments 1 and 3)
the product line should be expanded with differentiation by price and theme (relevant for all three segments)
the depth of the product line should be expanded by the size of the boxes
Brand equity policy:
the uniqueness of VkusVill boxes should be emphasized through brand values: naturalness, customer care, and innovation (relevant for all three segments)</td><td>Pricing:
price differentiation by segment
price range expansion
price differentiation by region
Loyalty system:
introduction of a 10% discount on a monthly subscription to boxes (relevant for segments 1 and 3)
cash back or bonuses for each purchase (e.g. 3% of the cost in the form of bonus points) (relevant for all three segments)
5-7% discount when returning a wooden box (relevant for segments 1 and 3)
Incentives for initial purchases:
10-15% discount on the first order (relevant for all three segments)
“Try the surprise box” promotion - a budget set option with a minimum price (e.g. 1,500 rubles) (relevant for segments 1 and 3)</td></tr>
<tr><th>P-Place</th><th>P-Promotion</th></tr>
<tr><td>Physical distribution channels:
at strategic points inside the VkusVill store (for example, near the ticket offices or at the entrance on prominent stands) (relevant for segments 2 and 3)
during special periods (e.g., New Year's Eve), temporary stores should be set up in shopping malls or other high-traffic locations (relevant for all three segments)
Vkusvill official website and mobile application:
in a separate category with an attractive visual design to facilitate the ordering process on the official website (relevant for all three segments)
on popular Russian e-commerce platforms such as Wildberries, Ozon (relevant for all three segments)
on gift search platforms, for example, sweet gift. (relevant for segments 1 and 3)
Social media and direct sales:</td><td>Promotion strategy:
combined strategy, including both push and pull methods
Promotion channels:
social networks: Instagram, Vkontakte, Telegram, Zen (development and targeted advertising) (relevant for all three segments)
micro-influencers, SEO promotion (relevant for segments 1 and 3)
internal: advertising at self-service checkouts, leaflets with QR, the official website and VkusVill application (relevant for segments 1 and 2)
marketplaces (relevant for all three segments)
Key promotion attributes:
convenience and time saving,
quality and naturalness
emotional connection
benefit and value</td></tr>
</table>

● organization of direct sales through integration with stores on Instagram Shop or VKontakte Shop (relevant for all three segments) Delivery and logistics: ● the "delivery on the day of the order" option during the holidays, when the time for choosing gifts is limited (relevant for all three segments) ● cooperation with logistics companies focused on sustainable development. (relevant for all three segments) Product diversification depending on the region: ● special products that meet the needs of different regions should be developed and targeted distribution should be carried out (relevant for segments 1 and 2)	● ease of choice Communications integration: channel synergy, unified branding, budget optimization

Table 2.

Proposed initiatives to improve the position of the company and the product in the market

Expanding the range of gift boxes	Packaging improvement	Expanding the loyalty system	Mass customization
- **Boxes for your beloved** These boxes will be a pleasant surprise for a loved one, because there is nothing more pleasant than waking up your soulmate with hot coffee, natural sweets and fresh fruits, aesthetically (instagrammatically) packed in a box. - **Beauty box** These boxes will not leave any girl indifferent: hand cream, and fragrant shower gel complete with natural chocolate is a useful	- **Multifunctional boxes** Packaging that can then be used in everyday life. For example, what if the company make dividers inside the box itself, which can then be used to store small items (for example, spices, medicines, or nails). The company can also add instructions for recycling the packaging to each box, for example, how to make a bird	- **Free delivery on the first order** - **Part of the proceeds** from the purchase of the box **goes to charity** - **Cumulative points system**. Each order earns the customer points, which can be exchanged for discounts or gifts. For example, for every 1000 spent rubles 1 point is awarded, and upon accumulation of 10 points client can get a discount of 1000	Mass customization is available directly on "VkusVill Prazdnik" website so that customers can choose the color, size and filling of their boxes themselves. This will allow you to create a personalized boxing for a loved one based on their preferences, tastes, and allergic reactions. *At the same time, customized boxes will cost more than the already assembled options, which will emphasize their

and pleasant sign of attention. Such a box should not be expensive and exceed 1800 rubles, but it will be a thoughtful gesture and leave a good impression. - **Boxes for home** These boxes can be offered not only to create a pleasant atmosphere in your own home but also for a visit. It is always nice to buy something that will make the house a little more comfortable: eco-candles, aromatic oils, organic tea, natural honey, and jam. - **Boxes for a child** These boxes are a good way to please a child, regardless of age. Delicious and most importantly, healthy sweets will appeal to everyone's taste! - **Cooking boxes** They will allow you to immerse yourself in the world of diverse cuisine right in your kitchen. Each box includes three carefully selected recipes and all the necessary ingredients for their preparation. Choose your favorite cuisine and enjoy the cooking process!	feeder or a plant pot out of a box. - **Package return (system)** Customers can return an empty box to any Vkusvill store, for which they receive a 10% discount on their next purchase or a bonus in the form of coffee and chocolates. It not only encourages customers to return packaging but also emphasizes the company's environmental responsibility, contributing to waste reduction and supporting sustainable development.	rubles for the next order. - **Promo codes for friends.** Customers can share unique promo codes with their friends. Upon the first order using this code, the new customer receives a discount, and the one who invited him receives additional points or a discount on the next order. - **Monthly subscription**. By subscribing for 1,000 rubles per month, you will receive exclusive discounts on all products on our website. The subscription is automatically renewed every month until it is canceled in your personal account.	exclusivity and importance.*

Table 3.

Proposed initiatives to improve the position of the company and the product in the market part 2

Development of social networks	Creating a unique offer	Improvement in internal resources	Increasing awareness

Social media is a platform where people look for inspiration and gift ideas (especially on the eve of the holidays), and bloggers have a lot of influence on their audience and can recommend VkusVill boxes as a great option for a New Year's gift. How bloggers can advertise boxes: - **Unboxing video**: show the process of unpacking a box, focusing on its contents and the originality of the gifts. - **Making a post with gift ideas** and include the boxes in the list of the best Christmas gifts, which will help position them as the perfect choice. - **Holding a contest or a raffle**: This will attract attention and increase audience engagement, as well as create additional interest in the product.	- **A surprise box**. The person chooses the amount, for example, 2000, 3000 or 5,000 rubles, and VkusVill creates an individual box filled with carefully selected goods. Process: after selecting the amount, you need to fill out a questionnaire where you will tell us about your hobbies, favorite colors and preferences. It is also important to indicate if you are allergic or intolerant to any types of food. Based on this information, the VkusVill team will select unique products that will suit this particular person. The element of surprise is that the person won't know, what exactly is inside the box until it opens. - **Advent calendar**. This is a set of 30 cells, each of which is filled with various surprises from VkusVill. It can be sweets, care products, drinks or small gifts, all carefully selected to create a joyful atmosphere. The Advent calendar is perfect for birthdays, New Year's Eve, or just to make weekdays special. This approach allows you not only to enjoy a variety of flavors, but also creates a festive	- **Website modernization** Everything looks very loaded, I want more “free space”. I recommend that company select 4-5 main categories, such as catering, ready-made gifts, sweets and flowers, and then create subcategories within them. This will help people find what they need faster and make the structure more understandable and logical. An example of a good website https: // myhyggebox.ru/shop/autumn - box/tproduct/ 362369725-880391799181- let's-stay-at-home-gift-set - **Creating a video format or having a high-quality photo shoot** (she mentioned that she knows about it herself, but it would not be superfluous). This will help to visualize what it looks like, what's inside, and what size it is.	- **Placement of digital outdoor advertising** not only at self-service cash desks in VkusVill stores (indoor) but also on outdoor advertising media. Implemented together with Yandex, this feature was launched quite recently, and now the company is actively looking for brands to partner with. In these promotional materials, the company can use promo codes to track metrics. - **Using boxes as a Product Placement** Many people are already tired of ardent advertising of goods, so the company can try to promote the boxes in a more restrained format, as the acting brand is doing now: 1. An interesting story shared by a blogger while unobtrusively using boxing products without focusing on it. 2. **Creating a heading for Reels**, where they show the process of cooking dishes using boxes, focusing on the cooking process itself. 3. **Photo/video format**, where the boxes are in a normal environment, for example, pictures are taken of a new kitchen set and there is a box.

	atmosphere that lasts for a whole month. - **Add customized postcards with personal wishes** that will be beautifully attached to the box, making the boxes look different from each other.		

A comprehensive promotional campaign must integrate digital and traditional approaches to increase visibility and attract diverse audience segments. Collaborating with influencers, launching targeted advertising on social platforms, and enhancing search engine optimization (SEO) are pivotal digital tactics. Offline strategies, such as partnerships with event venues and in-store product placements, can attract more attention from B2C and B2B markets.

Equally significant is developing a cohesive brand rhetoric centered on joy, care, and environmental stewardship. Catchy slogans, like “Celebrate Sustainability with VkusVill” can amplify the emotional resonance of the brand while highlighting its commitment to eco-friendly values.

Navigating a growing market presents challenges such as price sensitivity, seasonality, and competition. The strategy to mitigate these incorporates:

- **Seasonal Campaigns**: Designing unique offerings for peak periods like holidays ensures a steady revenue stream.
- **Tiered Pricing Models**: Introducing budget-friendly mini-boxes alongside premium options caters to a broader audience without diluting the brand’s value.
- **Data Analytics**: Leveraging AI tools to predict customer preferences and market trends enhances decision-making and product design.

Evaluating the strategy's impact involves tracking key performance indicators (KPIs), including market share, customer satisfaction scores, and repeat purchase rates. Regularly reviewing metrics and adapting the plan based on real-time feedback is likely to ensure its sustainability and efficacy.

To put it in a nutshell, developing a robust marketing strategy is crucial for “VkusVill Prazdnik” to capture a larger market share in the competitive gift box industry. Recommendations include prioritizing product quality and aesthetic appeal in messaging, tailoring approaches for key customer personas like professionals and gift-givers, and optimizing online channels for user experience and personalization. Investing in premium packaging options, AI-powered recommendations, and targeted social media advertising are essential. Focus on a seamless online experience and personalized offers through email marketing. Tracking KPIs like conversion rates, website traffic, and customer lifetime value will enable data-driven decisions. By leveraging VkusVill's strengths in high-quality, natural products, and offering customized themed gift boxes, the brand can differentiate itself and achieve its market share goal. Continuously measuring customer satisfaction and adapting strategies is vital for sustained success.

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China in Latin America: Just Economic Cooperation or a Field for Political Battle with the USA?

Китай в Латинской Америке: просто экономическое сотрудничество или поле для политической борьбы с США?

Abstract

The paper problematizes whether the Chinese activities in Latin American and Caribbean countries (LAC) are caused by genuine Chinese economic cooperation or by attempts to win the political battle with the USA. The paper comes to the conclusion that there is always a blend of these two and some other causes. During the analysis the following internal reasons were identified: to underpin the Chinese robust economic growth in order to continue to legitimize the ruling regime; to win allies and, thus, obtain additional legitimacy; to promulgate Chinese culture. In turn, the following external causes were discussed: to shift recognition from Taiwan and generally marginalize it; to make Tibet an internal issue; to persuade other states to turn a blind eye on the issue of human rights in China; to reciprocate the USA with its system of alliances in East Asia; to disseminate the Chinese currency, Yuan, via trade, loans, investments and bilateral currency swap agreements; to diffuse Chinese technologies, especially in such critical sectors as infrastructure, face recognition, 5G, telecommunications and vaccines.

Keywords: China; Latin America; the USA; influence; economic cooperation; political battle

Chinese trade with Latin American and Caribbean countries has increased dramatically in the past decades: from $12 billion in 2000 to $489 billion in 2023 – a 40-fold rise (Bello, 2024; Ray et al., 2024; World Economic Forum, 2021). A lot of scholars and pundits, contemplating this dramatic growth, started to ask what it means for the United States, especially after the start of the intensive Sino-American rivalry in 2016. While some authors claim that this is just economic cooperation (Jenkins, 2010) and that the primary aim of China is to create “win-win situations” (Teng, 2007) in accordance with its Five Principles of Peaceful Coexistence (United Nations, 1958, pp. 57–82), others disagree and increasingly point out that China considers Latin American and Caribbean countries (LAC) as a battlefield with the USA (Xing & Vadell, 2024) and that China uses its economic policies and capabilities for political purposes, which aimed first and foremost against the USA, such as the derecognition of Taiwan (Erikson & Chen, 2007) or the development of LAC critical national infrastructures such as 5G network by Chinese companies (Roy, 2023). Some authors even claim that Chinese efforts repeat historical colonialism and imperialism towards Latin American and Caribbean nations, which is now described as neocolonialism (Bernal-Meza & Li, 2020).

However, these authors failed to recognize that their respective findings showed, essentially, only one side of the issue, while there are many others. This paper advocates that instead of going by one of these “extreme” roads, it would be more prudent to take the middle road: that is, China sometimes utilises its economic capacities for political purposes with respect to the Chinese-US competition in LAC, but generally the actions of the Chinese government are primarily motivated by other interests aside from the rivalry with the USA or solely economic cooperation.

The paper is structured as follows: firstly, I will analyse internal reasons for Chinese activities in LAC; secondly, I will examine external causes for these activities; thirdly, I will conclude my analysis, including statements with respect to the economic cooperation and Chinese-US rivalry frameworks.

The most fundamental internal reason, as it is argued by many scholars, is the necessity of LAC for the Chinese economic growth. As it is argued by Safronova (2022), China is unable to permit an economic decline as far as it would put at risk the Chinese ruling regime. Latin American countries contain a lot of natural resources: Venezuela has the largest proven oil reserves and a notable amount of gas; Brazil is one of the leaders in iron production; Chile is a significant player in the copper market and so on (Sinnott et al., 2010). Therefore, as far as China is the largest producer of manufactured goods, it needs these primary commodities in order to sustain its industrial production.

By the same token, a notable part of exports from LAC to China is comprised of agricultural products. As it is noted by Boza et al. (2022), the Chinese share of the world population is 19%, while its possession of arable lands and water resources is only 7% and 6% respectively, which explains the need for agricultural imports.

The clearest illustration of the situation with primary commodities is the export to China from South America. According to the Harvard Atlas of Economic Complexity, in 2022 export of minerals was accountable for 42.19% of total exports ($70.6 billion), agriculture – 41.76% ($69.8 billion), metals – 7.67% ($12.8 billion) (Harvard University, 2022). It is clearly visible that 3 main categories which comprised a total share of 91.62% of exports to China are about primary commodities (Figure 1).

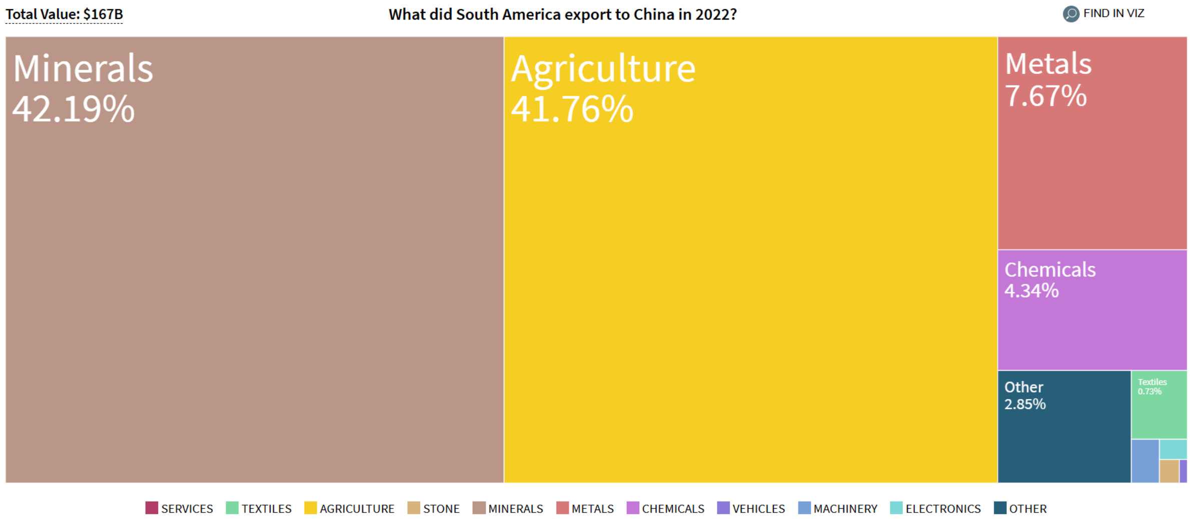

Figure 1. Export from South America to China in 2022

Furthermore, this state of affairs encouraged Bernal-Meza and Li (2020), using Wallerstein's (2004) world-system analysis, to argue that today LAC are a periphery to China as the former mainly supply the latter with primary commodities, while in exchange China exports manufactured goods consisting partly of Latin American and Caribbean minerals and metals.

Another reason for Chinese efforts in LAC is to obtain legitimacy which is based on political successes. The Chinese government wants to show the population that there exists a circle of developing countries which are in good relations with and understand China and which together seek common development, which is freely stated in its 2016 Latin American policy paper (China, 2016). Although it should be noted that some scholars argue that these political proclamations are just a "banner" for Chinese economic conduct (Piccone, 2020).

The next important reason is the promotion of the Chinese values and culture, which, essentially, signifies the advance of Chinese soft power in the region. For the Chinese people their 5000-year-old culture is a matter of pride and, which, as claimed by some authors, directly influences Chinese authorities' perception of the world and, consequently, their decisions (Lihua, 2013). Naturally, the Chinese government wants to keep people content, as a result of which it tries to promote Chinese culture worldwide. The fundamental instrument of this is the Confucius Institutes, whose number, as of 2024, includes 50 in LAC (Confucius Institute, 2024). They promote Chinese culture, philosophy, history, language, and perceptions of the world. Often they offer appealing scholarships and exchange programs for the not-rich LAC population. Almost all scholars agree that this is a successful instrument of soft power policy (Hartig, 2012; Kurlantzick, 2007), but some go even further and argue that its real purpose is to increase Chinese presence in respective countries, collaborate with Chinese diasporas, conduct espionage, disseminate propaganda, and recruit talented people for political purposes (Gilstrap, 2021; Nisley, 2022). Nevertheless, as far as internal reasons of the Chinese efforts in LAC are concerned, the dissemination of Chinese culture has a meaningful value for Chinese society, which further increases the party's legitimacy and paves the way for this kind of cultural activities including in LAC.

Undoubtedly, there are some important external causes, primarily related to foreign policy, and which will be addressed in this part. The most crucial is, of course, the Taiwanese issue. It is stated even in the 2016 Latin American policy paper (China, 2016) that China "appreciates that the vast majority of Latin American and Caribbean countries abide by the one China principle and support China's great cause of reunification." It is important to keep in mind that 7 out of today's 12 states that recognize Taiwan are located in the Western Hemisphere. Before this number was even higher, but in recent years 6 Latin American and Caribbean countries (starting with Costa Rica in 2007 and ending with Honduras in 2023) have shifted their recognition towards Beijing. The People's Republic of China uses different methods for compelling small countries to shift their recognition, such as economic assistance in development projects, foreign direct investments, and cheap, easy-to-obtain loans, which are especially lucrative in the years of economic crises and slow economic growth (Ellis, 2023; Li & Hsiang, 2021).

Another important bone of contention is Tibet. China wants it to be considered an internal issue and tries to exclude all mentions of Tibetan independence. In some cases it led to scandals involving Latin American states. For example, following Mexican-Chinese tensions in October 2004 the mayor of Mexico City and the politicians from the Chamber of Deputies met with the Dalai Lama, who, during his speech, said some unpleasant statements towards China. The Chinese ambassador called people who talk with the Dalai Lama as "opportunistic" and "ignorant" on the Tibetan issue. However, after some pressure the ambassador apologised for his harsh words (Domínguez, 2006). Generally, the Tibetan case is pretty much similar to the Taiwanese one, when the Chinese government tries to silence or buy off those who are favourable towards Tibetan or Taiwanese independence. Although it should be stated that the issue with Tibet has become less important in recent years, especially in comparison with the Taiwanese one.

Human rights are another contentious issue in Sino-Latin American relations. Human rights nowadays have become a norm in international politics (Risse et al., 1999), and if China wants to uphold its prestige in the international arena, it has to cope with these rules. As a result, the Chinese government uses similar tactics as in the cases described above to silence possible discontents on this issue (Bernal-Meza & Li, 2020).

The US system of alliances in Asia, which is used in order to contain China (Bush, 2016), incessantly irritated the latter. In order to reciprocate and counter US efforts in the region and challenge the Monroe Doctrine which is still active (Monroe, 1823), China continues to build its system of partnerships with LAC (Noesselt & Soliz-Landivar, 2013; Villar, 2023). This is not a conventional type of alliance, but rather an informal one, for the most part an economic alliance (e.g., through the Belt and Road Initiative (BRI) or China-CELAC Forum framework) with political implications. However, it should also be stated that China builds this system not specifically in order to reciprocate the USA; rather, this is only one of the Chinese motivations. Other motives include better economic cooperation, solidarity with developing countries, and advancing its own agenda to name a few.

A situation when one's national currency is the world's reserve currency signifies a significant advantage for every country. Undoubtedly, the Chinese government attempts to install yuan at this place (Soni & Jain, 2023) and, consequently, to obtain this passive advantage, gain economic benefits, weaken the dollar and, consequently, the USA. In this respect LAC play a crucial role, because these countries are notable Chinese economic partners. The promotion is happening through trade, as China is the world's largest manufacturer. Therefore, importing countries (if this is not a big deal which requires third-party currency such as USD) are obliged to pay in the exporter's currency, that is, in yuan. Also, Chinese investments, for instance, through BRI, are provided in yuan as well. Other kinds of loans are also provided in yuan and because LAC are the recipients of a large number of investment initiatives and loans, it further contributes to the promotion of yuan as the world currency as far as the repayment is required to be made in Chinese yuan. On top of this, bilateral currency swap agreements, when two central banks negotiate to buy the currency of the other using its own, also contribute to the internationalisation of yuan. For example, currently China has such agreements with Brazil, Argentina and Chile among LAC (Ma & Wang, 2022).

The technological sector is another field of Chinese efforts in LAC. It is widely known that the USA and China possess very sophisticated technological tools and instruments and that companies from these respective countries actively compete with each other (Gaspari Cirne de Toledo & Cirne de Toledo Júnior, 2021). Increasingly, China tries to incorporate its technologies into LAC infrastructure, including critical ones, and security systems (Trevisan, 2021). For example, a lot of Latin American and Caribbean countries bought (e.g., Mexico and Ecuador), often using Chinese loans, or sometimes even received free of charge (e.g., Brazil and Bolivia) Chinese surveillance systems with facial recognition, which raised concerns in Washington and in some parts of Latin American and Caribbean societies alike (Venturini, 2020). Besides, other disquiets included environmental worries and possible job losses (Ray & Gallagher, 2016). Other prominent examples of the incorporation of Chinese technologies encompass mobile communications, 5G networks and AI technologies. Special attention deserves so-called vaccine diplomacy (which is a very potent soft power tool) in the aftermath of the COVID-19 pandemic, when China supplied (sometimes free of charge) vaccines or shared technologies for the vaccine production with LAC in exchange for economic and political concessions and benefits (Lee, 2023; Xing et al., 2023). However, it should be stated again that these advancements are not only motivated in the framework of the rivalry between China and the USA; other important reasons include the desire to make the Chinese image better in LAC, to control more vital infrastructure, to help its partners overcome difficulties in order to make relations better and strengthen economic ties, and so on.

In conclusion, as can be seen from the analysis above, Chinese advancements in LAC cannot be classified either as "just economic cooperation" or as exclusively "a field for political battle with the USA." Rather, the Chinese activities in LAC are caused by various reasons and interests, albeit often including the two aforementioned, and, consequently, differ in eventual results.

The analysis revealed the following internal reasons for the Chinese efforts in LAC. Firstly, the necessity of LAC in order to sustain economic growth in China is vital for the continuing stay in power of the Chinese Communist Party; in particular, it was shown that today LAC in essence exports to China primary commodities such as minerals, agriculture, and metals, which to some extent put LAC in a dependent position on China. Secondly, obtaining legitimacy of the regime, which is based not on economic but political successes, such as an active engagement with LAC. Thirdly, to promote Chinese culture, values, and perspectives that are significant to the Chinese population, primarily through the use of Confucius Institutes, which indicates a growing influence of Chinese soft power.

As far as external causes are concerned, they were the following. Firstly, to compel Latin American and Caribbean states to withdraw their recognition from Taiwan using its economic (such as trade benefits and concessions, investment opportunities, and cheap loans) and political capabilities. Secondly, to silence LAC on the Tibetan issue using similar methods. Thirdly, to quiet LAC on the issue of human rights in China utilising the same instruments. Fourthly, to obtain allies, but symbolically in the US "backyard," also using its economic, political, and technological advancements. Fifthly, to internationalise the yuan and ideally make it the world's reserve currency, which included the usage of direct trade between countries, Chinese investments and loans, and bilateral currency swap agreements. Sixthly, to advance its technological reach and capabilities, especially in vital infrastructure, security systems, and healthcare.

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The Evolution of English Olympiad Tasks in Russia: A Shift Towards Communicative Competence
Эволюция олимпиадных заданий по английскому языку в России: смещение фокуса к коммуникативной компетенции

Abstract

English language Olympiads in Russia, including both the All-Russian School Olympiad and university-level Olympiads, have undergone notable transformations over the past two decades. Previous studies on English language Olympiads have primarily focused on their impact on students' cognitive development. However, limited research has been conducted on the evolution of Olympiad tasks themselves. This study aims to examine these changes by conducting a content analysis of Olympiad tasks from different years, focusing on structural and methodological shifts. The research investigates whether tasks have moved away from traditional grammar and translation-based exercises towards more communicative and analytical challenges, reflecting contemporary language teaching approaches. By systematically analyzing past and recent Olympiad materials, the study identifies key trends in task design, such as an increasing emphasis on discourse analysis, critical thinking, and real-world language application. Beyond understanding past and present trends, the findings might provide a basis for predicting which task formats may become dominant in the future.

Keywords: School Olympiad; English Olympiad; communicative competence; task design; pedagogical shift; language assessment.

The All-Russian School Olympiad in English has long played an important role in identifying talented students across the country. Over the past two decades, English Olympiads in Russia have undergone considerable transformation. According to Artem Gulov (2021, p. 2), Doctor of Pedagogical Sciences and a top-category teacher, "Every year, the competition developers are compelled to make Olympiad tasks more challenging, as interest in studying the subject continues to grow, and participants consistently demonstrate increasingly high-quality results". This notion raises thought-provoking questions and requires further exploration. An experienced Olympiad instructor highlights that the tasks are becoming more challenging; however, there is no definite explanation for how it occurs. It is hypothesized that Olympiad formats, originally focused on grammar drills and translation tasks, have gradually shifted towards promoting communicative and analytical language skills. While the cognitive benefits of Olympiads for students have been studied extensively, little research has addressed how the design of Olympiad tasks has evolved. There is a notable gap in research on how Olympiad tasks themselves have changed in accordance with modern educational goals. Thus, this paper investigates structural and methodological changes in Olympiad tasks, with a focus on communicative competence as a new pedagogical benchmark. By analyzing archived materials from the All-Russian School Olympiad and university-level competitions, this study aims to highlight key trends and anticipate future developments in task design. The research methodology is based on content analysis of Olympiad materials retrieved from the official educational platform *olimpiada.ru*. The tasks analyzed include municipal, regional, and final stages from 2007 to 2019. A comparative approach was applied to detect both structural and thematic changes in the All-Russian School Olympiad and some university-level competitions.

The theoretical foundation of this study is based on the concept of communicative competence, which has been central to foreign language education since the 1970s. The notion was first introduced by Dell Hymes (1972) as a critique of Chomsky's concept of linguistic competence, arguing that the ability to use language appropriately in social contexts is just as important as the knowledge of grammatical rules.

This idea was further elaborated by Canale and Swain (1980), who identified four core components of communicative competence:

- Grammatical competence – knowledge of lexical items and rules of morphology, syntax, semantics, and phonology.
- Sociolinguistic competence – the ability to use language appropriately in different sociocultural contexts.
- Discourse competence – the ability to understand and produce coherent and cohesive texts.
- Strategic competence – the ability to use verbal and non-verbal strategies to compensate for communication breakdowns.

These components formed the basis of later models, including the Common European Framework of Reference for Languages (CEFR, 2001). The CEFR introduced a system of language proficiency levels and emphasized the integration of real-world language use into learning and assessment, which has become a foundation for language teaching across Europe and beyond.

In the Russian context, Solovova (2021) adapted and expanded the CEFR model by including additional components such as sociocultural and social competence, highlighting the importance of cultural knowledge, empathy, and the ability to function in multilingual and multicultural environments. According to Solovova, the ultimate goal of language education is the development of a holistic communicative personality, capable of effective interaction in diverse settings.

In applied linguistics, the theory of task-based language learning and teaching (TBLT) also plays an important role in this context. As described by Ellis (2003) and Richards (2006), TBLT emphasizes the use of authentic, purposeful tasks to foster language acquisition. Tasks should simulate real-world communicative challenges and require learners to apply multiple competences simultaneously. Furthermore, Bachman (1990) and Brown (2004) argue that language assessments must move beyond testing isolated grammar skills and instead evaluate learners' ability to apply language meaningfully. This approach aligns closely with the current trends observed in English Olympiad task design. Gulov (2022, p. 86) notes that "Olympiad training builds on the principles of communicative language teaching whilst drawing important lessons from the features of the Olympiad format".

The All-Russian School Olympiad (also known as VOSH, VsOSH, or Vseros) is the oldest and most prestigious Olympiad in the country. Winners and runners-up of its final stage receive admission to specialized universities without entrance exams. The prototype of the national Olympiad can be traced back to the Olympiad for student youth held in the Russian Empire in the 19th century. In the USSR, from the 1930s onward, city Olympiads for school students began to emerge, particularly in mathematics, physics, chemistry, and linguistics.

Materials available on the website *olimpiada.ru*, which serves as the official informational partner of the All-Russian School Olympiad, as well as the Russian Council of School Olympiads, were examined. Tasks from all Olympiads listed by the Ministry of Education can be found there. As for the All-Russian Olympiad, the earliest available materials date back to 2007 and represent tasks from the municipal stage in Kaliningrad. The results of the content analysis are presented in Table 1. The examined tasks target high school students (Grades 9-11), with predominant representation from Grade 11 level materials. The task selection criteria were determined by two factors: firstly, the availability of task variants in the archival materials, and secondly, the particular significance of Olympiads at Grade 11 level for university admissions.

Table 1. Comparative Analysis Table of English Olympiad Tasks (All-Russian School Olympiad, 2007–2019).

Task Year & Stage	Listening	Reading	Use of English	Country studies	Writing	Speaking
2007-8 Municipal (Kaliningrad) 11 grade	Matching	Matching; Multiple choice	Word formation; Verb conjugation; Direct translation from Russian	Basic facts, short-answer questions	Letter to a pen-friend (informal)	-
2009-10 Regional	Matching; T/F	Matching; Multiple choice	Multiple choice; Idioms; Crossword puzzle	-	Story completion based on the beginning and the ending (neutral)	Monologue time 1,5-2 min; Answering questions 2 min
2009-10 Final	Matching; T/F	Matching; Multiple choice	Gap filling; Crossword puzzle; Idioms (matching definitions); Matching the utterances	-	Story completion based on the beginning (neutral)	Monologue time 1,5-2 min; Answering questions 2 min

2010-11 Final	Matching; T/F; Integrated listening & reading (251 words)	Multiple choice	Multiple choice; Crossword puzzle	5 abbreviations	Story completion based on the beginning (neutral)	Monologue time 1,5-2 min; Answering questions 2 min
2011-12 Final	T/F; Integrated listening & reading (233 words)	Multiple choice	Word formation; Multiple choice; Crossword puzzle	-	Story completion based on the picture (neutral)	Monologue time 1,5-2 min; Answering questions 2 min
2012-13 Final	T/F; Integrated listening & reading (295 words)	Matching	Error spotting; Word formation; Multiple choice; Crossword puzzle	British novelists	Story completion based on the picture (neutral)	15 min preparation; Monologue time 3-4 min; Answering questions 2 min
2013-14 Final	Multiple choice; T/F; Integrated listening & reading (263 words)	Matching; Multiple choice	Word formation; Multiple choice; Crossword puzzle	-	Student magazine article (neutral)	15 min preparation; Monologue time 3-3,5 min; Answering questions 2 min
2014-15 Final	Multiple choice; T/F; Integrated listening & reading (289 words)	T/F; Matching; Multiple choice	Multiple choice; Filling the gaps – Open Cloze	Writers; British culture quiz (matching definitions)	Report (formal)	15 min preparation with fact file; Monologue time 2-3 min; Answering questions 2-3 min
2015-16 Final	Multiple choice; T/F; Integrated listening & reading (307 words)	Matching; Multiple choice	Open Cloze; Idioms	Shakespeare's life and quotes	Student magazine article (neutral)	15 min preparation; Monologue time 2-3 min; Answering questions 2-3 min

2016-17 Final	Multiple choice; T/F; Integrated listening & reading (331 words)	T/F; Matching;	Multiple choice; Idioms	Famous figures, cultural context	Student magazine article (neutral)	15 min preparation; Monologue time 2-3 min; Answering questions 2-3 min
2017-18 Final	Multiple choice; T/F; Integrated listening & reading (302 words)	T/F; Matching; Multiple choice	Crossword puzzle; Open Cloze; Puns	Famous places in UK & US	Short story (neutral)	15 min preparation; Monologue time 3-4 min; Answering questions 2-3 min
2018-19 Final	Multiple choice; T/F; Integrated listening & reading (302 words)	T/F; Matching; Multiple choice	Word formation; Crossword puzzle	Explorers & geography	Review (neutral)	15 min preparation; Monologue time depends on the video; Answering questions 2-3 min

The data show that Olympiad tasks in the early years (e.g. 2007-2008) mainly focused on grammar exercises, direct translation, and isolated vocabulary tests (see Figure 1). By contrast, recent Olympiads (2010s onward) introduced integrated reading and listening tasks, prepared monologues, and writing formats simulating authentic communication (e.g. reports, reviews). Tasks such as formal report writing, creative storytelling, and multimodal communication (e.g., video-based speaking tasks) became common. A noticeable methodological turning point occurred in the 2012-2013 Olympiad season, when speaking tasks became longer, more structured, and culturally embedded. However, this increase in complexity was followed by some moderation the next year: country studies were removed, monologue time was shortened, and reading texts became more concise. It appears that the organizers might have initially established unrealistically high standards during the significant task restructuring in the 2012-2013 academic year. Perhaps as a response to this elevated complexity; adjustments were made the following year to slightly ease the Olympiad’s difficulty. For instance, the component related to country studies was removed in 2013-2014, the length of integrated reading and listening tasks was reduced from 295 to 263 words, and the duration of the monologue portion was shortened from 3-4 minutes to 3-3.5 minutes. These modifications suggest that the previous year's tasks might have been overly challenging, prompting an adjustment aimed at maintaining fairness and accessibility for participants. Still, the overall trend towards communicative competence remains the same.

Task 4 – 5 баллов

*For Questions **39-43**, translate the following sentences from Russian into English.*

39. Сколько новых проектов было осуществлено в этом году?

____

____

40. Чем труднее задача, тем большее удовольствие доставляет ее решение.

____

____

41. Она вечно давала всем бессмысленные советы.

____

____

42. Он заявил, что ждал с самого утра, и не будет ждать ни минуты больше.

____

____

43. Я видела, как он стоял у дороги, сравнивая карту с дорожными указателями.

____

____

TRANSFER ALL YOUR ANSWERS TO YOUR ANSWER SHEET

Figure1. English language tasks from the All-Russian School Olympiad (Kalininingrad Region, Grade 11, 2008).

As for the university-level Olympiads, several notable examples illustrate the phenomenon in question – a shift towards communicative competence. In the *Vysshaya Proba* competition by HSE University, tasks used to be presented in Russian (2014-2017 school years), and now only English versions are available. This shift probably highlights the strive for the complete immersion into the language. Furthermore, the Olympiad organized by the Russian Presidential Academy (RANEPA) is considered to be one of the most unpredictable and, thus, interesting. For instance, the tasks (see Figure 1) feature English slang words and abbreviations used in Internet discourse (2022-2023 school years).

Task 9.2. Максимальное количество баллов — 8 баллов.
Complete the dialogue using abbreviations, contractions or special symbols presented on the left side.

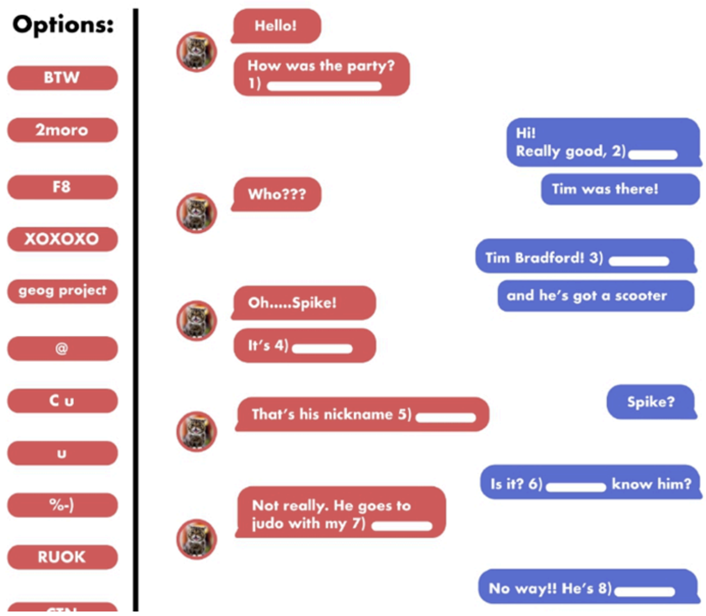

Figure 2. Fragment of the English language task from the RANEPA Olympiad (final stage, 2022-2023).

The findings confirm a broader pedagogical shift. It is clear that tasks have evolved and now better reflect real-world communication, as they require not only language accuracy, but also cultural awareness. This shift has practical significance, which lies in its alignment with global trends in language teaching, especially the Common European Framework of Reference for Languages (CEFR). It leads to Russian students' better preparedness for university studies, international exams, and intercultural communication.

In conclusion, the analysis demonstrates that English Olympiad tasks in Russia have moved significantly towards fostering communicative competence. They now serve not only as a test of language knowledge, but also as means of developing communicative and analytical skills. In comparing the traditional and recent task formats, a distinct pedagogical shift can be observed. Earlier Olympiads emphasized rote memorization, mechanical grammar drills, and isolated vocabulary lists. Recent formats, by contrast, include problem-solving, creative writing, analytical reading, and oral argumentation — tasks that closely reflect the principles of communicative language teaching. It is likely that future tasks will follow this track, integrating digital tools, multimodal materials, and real-life simulations. This shift has a potential to further modernize Olympiad pedagogy and increase its relevance to today's learners.

The prospects of this study are to examine the perception of communicative tasks by students, teachers, and task developers to assess how these changes are understood and received. Moreover, further research could expand the scope by analyzing task evolution not only in the All-Russian Olympiad, but also in Olympiads from other countries to make cross-national comparisons.

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The Impact of RCEP on Economic Relations between ASEAN Countries and China
Влияние ВРЭП на экономические связи между странами АСЕАН и Китаем

Abstract

In the context of the deepening regionalization of the global economy, the Regional Comprehensive Economic Partnership (RCEP) represents one of the most significant frameworks for advancing economic cooperation across the Asia-Pacific. This paper investigates the impact of RCEP on economic relations between ASEAN member states and China, focusing on trade in goods and services as well as investment flows following the agreement's entry into force. Employing a combination of qualitative and quantitative methods, including the calculation of the Regional Orientation Index (ROI) and comparative analysis of trade data from 2022 and 2024, this research provides a comprehensive evaluation of RCEP's implications for ASEAN–China economic cooperation. Additionally, the study examines changes in import tariffs to assess their impact on trade dynamics within the region. Drawing on ROI, the study reveals notable structural shifts in sectoral trade patterns and geographic trade orientation. The empirical findings confirm that while RCEP has had a moderate effect on the growth of merchandise trade, it plays a pivotal role in fostering service trade liberalization and enhancing regional investment activity.

Keywords: RCEP; ASEAN–China relations; regional trade agreement; trade indexes; digital trade; trade in services; investment flows.

In recent years, the global economic landscape has been increasingly shaped by a trend toward deglobalization. This shift has been largely driven by the adverse effects of the 2008–2010 financial crisis and the COVID-19 pandemic, which exposed the vulnerabilities of deep interdependence among national economies. In response, many countries have redirected their focus from global to regional frameworks for regulating economic activity. A key factor behind this trend is the ongoing crisis within the World Trade Organization (WTO), exacerbated by rising protectionism, the politicization of trade relations, and the collapse of the WTO Appellate Body. Trade wars and violations of multilateral commitments have further undermined confidence in the global trade system, calling into question the WTO's continued relevance (Zuev et al, 2021, pp. 42–64).

These developments have stimulated the emergence and intensification of regional integration initiatives and the proliferation of Regional Trade Agreements (RTAs). According to WTO data, the number of RTAs has steadily increased since 1948, with significant acceleration during the 1990s. As of early 2025, there are 373 RTAs in force globally, the vast majority (333) established in the form of free trade areas (World Trade Organization [WTO], 2025). The European Union is currently the leading actor in terms of the number of agreements signed, with over 47 RTAs in force (WTO, 2025). Nevertheless, new centers of economic activity have emerged, particularly China and the countries of Southeast Asia.

China's longstanding interest in strengthening its economic influence in Southeast Asia has made ASEAN one of its principal trading partners. Through ASEAN-centered mechanisms such as ASEAN+3 and ASEAN+6, China has pursued a strategy of deepening regional cooperation. The signing of the Regional Comprehensive Economic Partnership (RCEP) in 2020 represented a logical continuation of these efforts, institutionalizing cooperation among 15 Asia-Pacific countries. After entering into force in 2022, RCEP has contributed to an increase in trade volume and greater economic interconnectedness within the region.

However, the impact of RCEP on economic relations between ASEAN and China remains complex and cannot be described as unambiguously positive. The anticipated growth in mutual trade has not fully materialized, and the agreement's effects exhibit both promising trends and notable limitations. Furthermore, regional cooperation under RCEP is characterized not only by conventional tariff liberalization, but also by new mechanisms for sustaining close economic ties—such as regulatory harmonization and digital trade facilitation. These factors underline the relevance and significance of the present study.

Against the backdrop of the already outlined transformation of the global trade system, the shift toward Regional Trade Agreements (RTAs) is becoming increasingly evident. In an environment of heightened uncertainty, RTAs have become a crucial instrument for adapting national economies to the evolving architecture of international trade, enabling states to establish more flexible, pragmatic, and mutually beneficial frameworks for economic cooperation.

RTAs offer contractual flexibility, allowing for the accommodation of differences in levels of socio-economic development among participating countries. They encompass both tariff-related and non-tariff instruments of regulation. The most common form of RTAs remains free trade areas, which provide for the reciprocal reduction or elimination of import duties, while preserving the autonomy of trade policy in relation to third countries.

Contemporary RTAs are characterized by several new features. First, there has been a marked increase in the participation of developing countries, which now account for the majority of new agreements. Second, the emergence of «super-integrated» economies has become notable—these are countries whose external trade is predominantly conducted within preferential agreement frameworks. Third, the agenda of RTAs has become significantly more complex, now encompassing regulatory harmonization, enhanced access to service markets, and the liberalization of capital and technology flows (Spartak, 2017, pp. 13–37).

In this context, the terminology of «WTO-plus» and «WTO-extra» has gained traction. The former refers to provisions that deepen existing WTO obligations—for example, further tariff reductions, greater procedural transparency, or broader access to service markets. A typical case is the Canada–European Union Comprehensive Economic and Trade Agreement (CETA), which eliminated 99% of tariffs but also achieved wide-ranging regulatory harmonization in areas such as safety standards, technical regulation, and public procurement (Spartak, 2017, pp. 13–37). The «WTO-extra» category, by contrast, refers to obligations in domains not currently covered by WTO rules: competition policy, environmental protection, consumer rights, healthcare and education measures, social standards, anti-corruption efforts, digital trade, public procurement, and institutional transparency (UNCTAD, 2013, p. 18). Together, these developments reflect not only an expansion of the RTAs' agenda, but also a substantial enhancement of their regulatory significance.

Since the mid-2010s, a new trend has taken root in international trade policy—namely, the formation of mega-regional trade agreements (MRTAs). This development has been driven, on the one hand, by the deepening crisis of the multilateral system, and on the other, by the so-called «noodle bowl effect», whereby the proliferation of overlapping RTAs creates regulatory confusion, incompatibility of rules, and increasing transaction costs (Bhagwati, 1995, pp. 1–23). Such fragmentation undermines multilateral negotiations within the WTO framework, rendering global trade less open and less predictable.

MRTAs are distinguished by several key characteristics. First, they entail a deeper level of integration, encompassing not only traditional tariff-related provisions but also institutional dimensions such as investment regimes, competition standards, intellectual property rights protection, the digital economy, and environmental commitments. Second, these agreements possess a broad geographical and economic scope, typically involving at least two major global economic actors. Collectively, MRTA member states may account for up to one-third of global GDP and trade flows. Third, MRTAs address an expansive agenda that extends far beyond the classical provisions of the WTO, covering areas such as research and development, consumer standards, energy, sustainable development, healthcare, e-commerce, and digital transformation. Altogether, this renders MRTAs modern instruments of multi-level institutional coordination (Portanskiy, 2017, pp. 47–53).

One of the most prominent MRTAs of the present era is the Regional Comprehensive Economic Partnership (RCEP), signed in 2020 and entering into force in 2022. It brought together fifteen countries from the Asia-Pacific region—ASEAN member states, China, Japan, South Korea, Australia, and New Zealand—becoming the largest trade agreement in history by number of participants. RCEP reflects a shared ambition among these countries to deepen regional economic cooperation and to establish a flexible, large-scale, and technology-oriented trade regime capable of adapting to emerging challenges such as digitalization, the restructuring of global value chains, and shifts in global economic conditions.

Against this background, a relevant research objective emerges to examine how RCEP influences the development of economic ties between its key members, particularly ASEAN and China. This study undertakes a comprehensive assessment of changes in trade in goods, services, and investment following the agreement's entry into force.

Prior to the conclusion of the Regional Comprehensive Economic Partnership (RCEP), the foundation of economic relations between China and ASEAN countries was ACFTA—the ASEAN–China Free Trade Area (ASEAN Secretariat, 2002), which primarily focused on reducing tariff barriers. However, ACFTA was characterized by a limited scope and lacked adaptive mechanisms necessary for responding to the challenges of the modern global economy. In contrast, RCEP has established a unified institutional framework for cooperation, encompassing a broader range of areas, including not only trade in goods, but also services, investment, and the digital economy. The agreement eliminated overlap and fragmentation among pre-existing arrangements, offering participants a harmonized regulatory regime. Thus, RCEP did not simply build upon existing agreements—it represented a qualitatively new format of economic cooperation, effectively replacing fragmented bilateral and multilateral deals (New Zealand Foreign Affairs & Trade, 2020).

Negotiations on the establishment of RCEP began in 2011 and initially included 16 countries—ASEAN members, China, Japan, South Korea, India, Australia, and New Zealand. In 2020, the agreement was signed by 15 states, with India withdrawing due to concerns over potential dominance by Chinese imports (Pak, 2021, pp. 157–182) and entered into force in 2022. According to 2022 data, the participating countries accounted for more than 30% of global GDP and international trade, underscoring the scale of the partnership. The agreement comprises 20 chapters and over 500 pages, with primary emphasis on the unification of tariff regimes, the removal of technical and non-tariff barriers, and the simplification of trade procedures. Over a 20-year period, the parties committed to reducing 92% of customs duties while, for the first time, introducing clear mechanisms for temporary safeguard measures—an institutional advance over earlier ASEAN–China agreements (New Zealand Foreign Affairs & Trade, 2020)

One of RCEP's most significant innovations lies in the reform of rules of origin. Unlike ACFTA, which required at least 40% of regional content for preferential treatment, RCEP allows products manufactured using materials from any member country to qualify. This facilitates supply chain integration and reduces the costs of obtaining originating status. Procedures for certifying origin have also been substantially simplified: electronic declarations are accepted, and verification can be conducted without the need for paper-based certification, thereby improving efficiency and reducing administrative burdens (New Zealand Foreign Affairs & Trade, 2020).

In addition, the agreement includes provisions to enhance transparency in the application of non-tariff measures. A dedicated Committee on Trade in Goods has been established, authorized to monitor the implementation of obligations, address complaints, eliminate trade barriers, and even recommend the acceleration of tariff liberalization. This mechanism surpasses previous bilateral oversight formats in terms of institutional comprehensiveness, thereby improving the efficiency of dispute resolution (New Zealand Foreign Affairs & Trade, 2020).

Another key innovation of RCEP is the codification of norms governing electronic commerce. For the first time in a regional trade agreement, parties have committed to ensuring the free cross-border flow of data, mutual recognition of electronic signatures and contracts, and the development of electronic customs systems. These provisions have contributed to the rapid expansion of digital trade between China and ASEAN countries. According to estimates, by 2025, the region's digital economy may reach USD 9.58 trillion (Rui, 2024, pp. 196–205). Thus, RCEP has not only reinforced trade and investment linkages but also acted as a catalyst for the digital transformation of regional commerce, lending China–ASEAN cooperation a systemic, resilient, and future-oriented character.

To assess the impact of the Regional Comprehensive Economic Partnership (RCEP) on trade relations between ASEAN and China, a key quantitative tool employed is the Regional Orientation Index (ROI)[1]. This metric enables the identification of whether a specific export market holds priority over other external destinations for a given country. An index value greater than 1 indicates that trade flows to the examined destination exceed the global average, signifying regional prioritization. Therefore, changes in the index reflect not only the degree of economic engagement between parties but also sectoral shifts influenced by the implementation of RCEP.

For the purpose of calculating the index, 99 product positions were selected and grouped into 12 aggregated commodity categories. Comparative analysis was conducted using data from 2022 (the year RCEP entered into force) and 2024 (the most recent available data). This approach facilitates the identification of both long-term trends associated with the ASEAN–China Free Trade Area and short-term developments linked to the implementation of new RCEP provisions. The use of index analysis provides a more accurate picture of sectoral shifts and supports the adaptation of foreign trade strategies. Figure 1 presents the comparative dynamics of the Regional Orientation Index for ASEAN countries with respect to China across various commodity groups in 2022 and 2024.

[1] The value of the Regional Orientation Index is calculated using the following formula:

where: x_{isd} – exports of the reporting country to the FTA partner country by sectors; X_{sd} – total exports of the reporting country to the FTA partner country; x_{isw} – exports of the reporting country to all countries worldwide by sectors; X_{sw} – total exports of the reporting country to all countries worldwide (Mikic & Gilbert, 2009, p. 32).

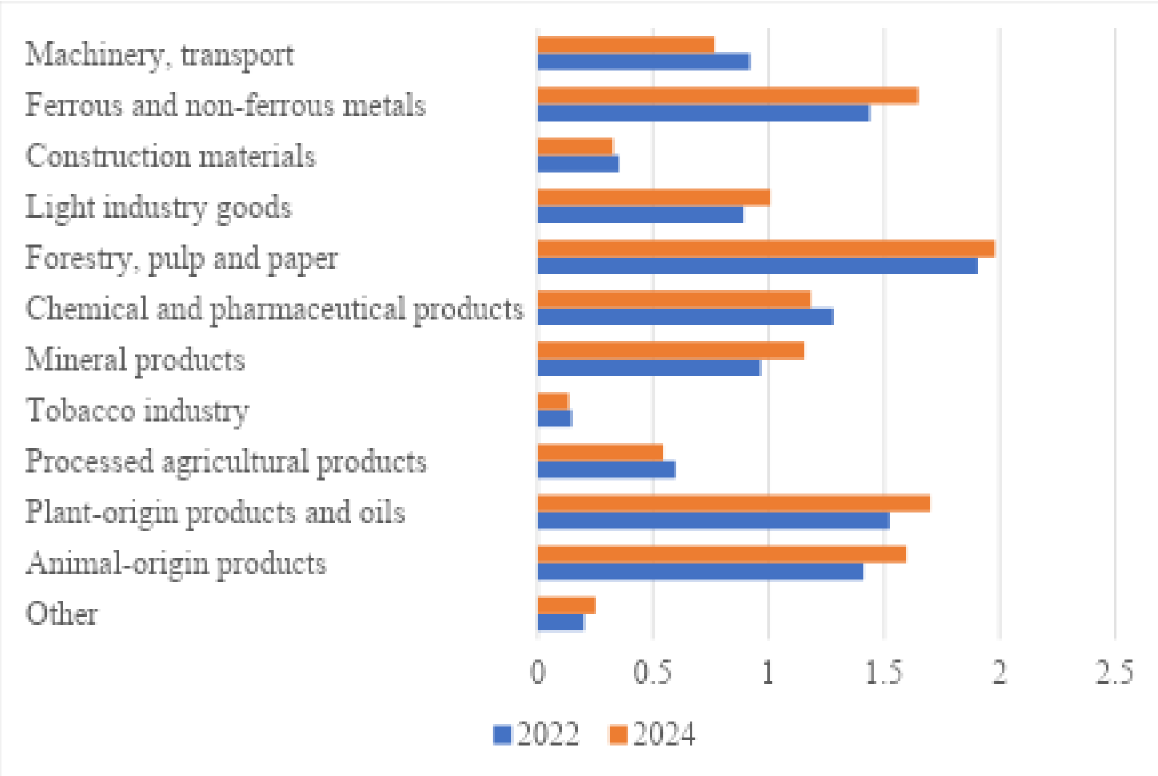

Figure 1. Dynamics of ASEAN's Regional Orientation Index for Exports to China by Product Groups: Comparative Analysis for 2022 and 2024 (Reference: author's calculation based on data from International Trade Centre, 2025. Retrieved from https://www.trademap.org)

It is important to note that the results were also influenced by the existing ASEAN–China Free Trade Area (ACFTA). In particular, in 2010, the primary categories of goods exported from ASEAN countries to the Chinese market included products of plant origin, chemical and pharmaceutical products, light industry goods, and machinery.

By 2022, high export values were observed in the same categories, indicating the continued effect of ACFTA. However, in 2022, the leading export category shifted to forest and pulp-and-paper products. In addition, exports of animal products, as well as ferrous and non-ferrous metals, increased compared to 2010.

By 2024, the composition of key export categories had changed further. Forest and pulp-and-paper products, goods of plant and animal origin, and ferrous and non-ferrous metals became the most significant export groups. These changes occurred within just two years after RCEP came into force, which can be attributed to the agreement's provisions on accelerated tariff reductions for pulp-and-paper products, ferrous metals, and agricultural goods. This indicates a strong RCEP-induced impact on the sectoral structure of goods trade between the countries in question.

To clearly illustrate the structural changes in ASEAN exports to the Chinese market, commodity sectors can be classified into four groups:

1. The Regional Orientation Index (ROI) was below 1 in 2022 but became significant in 2024 (i.e., rose above 1);
2. The ROI was below 1 in both 2022 and 2024;
3. The ROI was above 1 in both 2022 and 2024;
4. The ROI was above 1 in 2022 but fell below 1 by 2024.

Criteria for ASEAN	Remained/Became Insignificant (2024)	Remained/Became Significant (2024)
Were significant (2022)	–	1. Chemical and pharmaceutical products, fertilizers 2. Plant-origin products and oils 3. Animal-origin products 4. Forestry, pulp and paper, and printing industry 5. Ferrous and non-ferrous metals and products thereof
Were not significant (2022)	1. Other 2. Construction materials 3. Tobacco industry 4. Processed agricultural products 5. Machinery, transport, and high-tech equipment	*1. Mineral products* *2. Light industry goods, including carpets, clothing, footwear*

Figure 2. Dynamics of Trade Significance of Commodity Categories in ASEAN Exports to China between 2022 and 2024 (Reference: compiled by the author based on International Trade Centre data, 2025. Retrieved from https://www.trademap.org).

Undoubtedly, the most analytically significant categories are those that experienced substantial shifts, particularly the product groups marked in italics in the table, which saw a notable increase or decrease in export volumes by 2024 compared to 2022, as illustrated in Figure 2.

An analysis of the Regional Orientation Index for ASEAN exports to China reveals significant changes in the structure of priority export sectors. Several industries that had previously been of low importance gained strategic relevance by 2024. Two product categories in particular—mineral products and light industry goods—demonstrated marked export growth. This change is directly attributable to the implementation of RCEP, as similar trends were absent from 2010 to 2020 under previous bilateral arrangements.

China's tariff policy on light industry goods remained generally stable between 2022 and 2024. Most items, such as plastics (code 39), leather raw materials (code 41), and textile fibers and fabrics (codes 50–60), were subject to low or zero tariffs, especially for least-developed countries. However, relatively high tariffs remained for rubber products (code 40 – 20%), leather goods (code 42 – 10%), fur products (code 43 – 15%), apparel (codes 61–62 – 6% and 8%, respectively), and footwear (code 64 – 10%) (World Trade Organization, 2025). The tariff reductions introduced with RCEP facilitated the growth of ASEAN light industry exports to China. Nonetheless, future trade expansion is expected to result primarily from procedural simplifications and non-tariff measure liberalization rather than further tariff cuts.

Another export category that showed significant growth in trade volumes from ASEAN to China is mineral products. In 2022, China applied zero tariffs on imports of salt, sulfur, limestone, cement, ores, slags, and ash. For oil, coal, and petroleum products, the 2022 most-favored-nation (MFN) rates were 3%, with a 0% rate applied to least-developed countries. The 2024 tariff structure remained largely unchanged. This confirms that RCEP solidified the maintenance of extremely low tariff rates on key mineral resources from ASEAN countries.

Figure 3 illustrates the comparative dynamics of China's Regional Orientation Index across various commodity groups toward ASEAN countries for 2022 and 2024. Overall, a moderate increase in regional orientation can be observed for several categories. The highest index values in both years, mineral products and goods of plant origin were recorded, which were strongly represented in Chinese exports to ASEAN. In addition, growing regional orientation is evident in sectors such as processed agricultural goods, forest and pulp-and-paper products, and animal products. Conversely, certain categories—such as tobacco and chemical-pharmaceutical products—remained characterized by low levels of regional orientation.

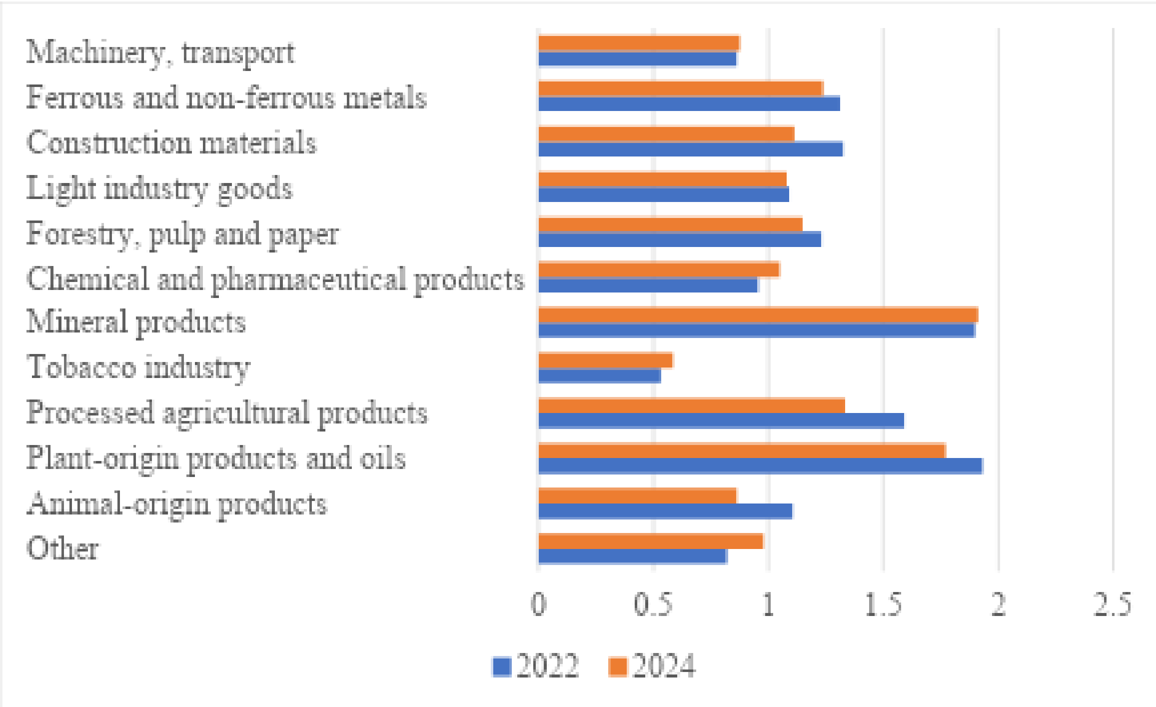

Figure 3. Dynamics of China's Regional Orientation Index for Exports to ASEAN by Product Groups: Comparative Analysis for 2022 and 2023
(Reference: author's calculation based on data from the International Trade Centre, 2025. Retrieved from https://www.trademap.org)

In fact, due to the absence of reliable data for 2024 that could enable a comprehensive comparison of tariff-related developments, the analysis is limited to data from 2022 and 2023 for two ASEAN countries—Vietnam and Indonesia—in relation to China. The choice of these countries is based on their pivotal role in trade and economic relations with China within the ASEAN framework and the considerable volume of mutual trade. Moreover, Vietnam and Indonesia pursue differing trade policies, which allows for a more illustrative assessment of the impact of tariff changes on export dynamics.

The product categories with notable changes in export volumes between 2022 and 2024 are of particular interest. (see Figure 4). For instance, animal products, which were of high significance in 2022, lost this status by 2024, indicating a noticeable decline in export volumes. This section examines the main aspects of the customs policy applied by the two ASEAN countries toward China. In both 2022 and 2023, Vietnam maintained a stable tariff policy for animal products (HS codes 01–05), applying a 0% tariff rate to all goods within this category. Indonesia, however, revised its tariff policy in 2023, raising duties on meat,

meat products, dairy products, and other animal-origin goods from 0% to 5% (World Trade Organization, 2025). This increase in tariffs by Indonesia coincided with a decline in exports of animal products from China to ASEAN countries, indicating the sensitivity of trade flows to changes in tariff burdens.

Criteria for China	**Remained/Became Insignificant (2024)**	**Remained/Became Significant (2024)**
Were significant (2022)	*1. Animal-origin products*	1. Ferrous and non-ferrous metals and products thereof 2. Construction materials 3. Mineral products 4. Processed agricultural products 5. Plant-origin products and oils 6. Forestry, pulp and paper, and printing industry 7. Light industry goods, including carpets, clothing, and footwear
Were not significant (2022)	1. Other 2. Machinery, transport, and high-tech equipment 3. Tobacco industry	*1. Chemical and pharmaceutical products, fertilizers*

Figure 4. Dynamics of Trade Significance of Commodity Categories in China Exports to ASEAN between 2022 and 2024 (Reference: compiled by the author based on International Trade Centre data, 2025. Retrieved from https://www.trademap.org).

Exports of chemical products, pharmaceuticals, and fertilizers from China to ASEAN countries increased between 2022 and 2024, despite the absence of full tariff liberalization. In Vietnam, import tariffs on all goods in this category (HS codes 28–38) remained at 0% in both 2022 and 2023. In Indonesia, zero rates were applied in 2022 to all subgroups except for code 36 (explosives), which was subject to a 5% duty. In 2023, Indonesia imposed a 5% tariff on products under codes 28 (inorganic chemicals), 30 (pharmaceuticals), 31 (fertilizers), 32 (dyes and pigments), 33 (cosmetics and perfumery), 35 (starches and glues), 36 (explosives), 37 (photographic materials), and 38 (miscellaneous chemical products), and a 10% rate on detergents and cleaning agents (code 34), while maintaining a 0% rate on organic chemicals (code 29) (World Trade Organization, 2025). The growth in Chinese exports of chemical products can be attributed not to tariff reductions, but to market-driven factors—specifically, strong demand for fertilizers and pharmaceuticals, China's competitive pricing, and the reliability of its supply chains amid global logistical disruptions.

Following the entry into force of the RCEP in 2022, participating countries gained broader access to one another's domestic markets in the services sector, marking a significant shift from prior ASEAN–China agreements. The agreement codified key principles, including national treatment, simplified procedures for establishing branches and representative offices, and regulatory transparency obligations. A particularly notable innovation was the focus on digital and financial services, such as telecommunications, insurance, cross-border payments, and banking. For the first time, the agreement established a list-based approach: a positive list (e.g., in China, Vietnam, Thailand) restricts access by default, while a negative list (e.g., in Singapore, Japan, Malaysia) guarantees openness with minimal exceptions (Kimura, Thangavelu, & Narjoko, n.d., pp. 19–61).

There is a discernible upward trend in the services trade, despite the absence of comprehensive statistics. China’s import of services grew from $470 billion in 2020 to over $600 billion in 2023, while ASEAN countries expanded their exports from $390 billion to $550 billion over the same period. Singapore dominates the region in services trade volume, while Vietnam and Malaysia exhibit notable growth, in contrast to the minimal involvement of Laos, Myanmar, and Brunei (International Trade Centre, 2025).

ASEAN's services exports to China exceeded $39 billion in 2021 and continued to grow, especially in professional, digital, and technical service segments. Conversely, ASEAN's imports from China reached $32 billion, primarily in logistics, construction, and telecommunications. The recovery of the tourism sector and ongoing digitalization have further supported the expansion of services trade flows. At the same time, variations in the services sector’s share of GDP (from 72.4% in Singapore to 36.2% in Cambodia) explain the uneven degree of participation among ASEAN countries in implementing RCEP provisions (Asian Development Bank, 2023). Overall, the agreement represents a significant step toward institutionalizing integration in the services domain and has stimulated early positive developments.

The RCEP’s implementation in 2022 also provided a robust institutional framework for investment cooperation between China and ASEAN. A negative list mechanism was introduced, whereby foreign investment is permitted in all sectors except those explicitly listed in the annex. The agreement affirms national treatment (Article 10.3), most-favored-nation status (Article 10.4), freedom of capital transfers, and protection against expropriation—including clarification of indirect expropriation (New Zealand Foreign Affairs & Trade, 2020). It prohibits forced technology localization, export mandates, and nationality requirements in management, thereby expanding business freedom. Furthermore, RCEP enhanced institutional mechanisms to support investment, including contact points and pre-dispute resolution procedures.

These developments have contributed to a notable increase in investment. The volume of foreign direct investment (FDI) from ASEAN into China rose from $105.8 billion in 2021 to $119.1 billion in 2022, with manufacturing accounting for 38.2% of the total (Ministry of Commerce of the People's Republic of China, 2023, p. 45). At the same time, Chinese investment into ASEAN reached $15.5 billion, maintaining a stable share of approximately 6%, trailing behind the United States and Japan. China’s main investment areas included manufacturing, the digital economy, finance, and logistics (The ASEAN Secretariat, 2023, p. 186). State-owned enterprises invested in infrastructure, energy, and resource extraction, while private companies focused on technology, electronics, and textiles. The post-pandemic recovery and the liberalization introduced under RCEP helped spur increased investment activity.

Despite progress, several challenges persist. These challenges include competition from other major donors, geopolitical tensions, and domestic regulatory barriers in several ASEAN countries. Sustained investment growth will require further improvements in the business environment and the strengthening of mutual trust.

In summary, the Regional Comprehensive Economic Partnership (RCEP) has emerged as the most significant regional initiative of the past decade, aimed at replacing fragmented trade arrangements in the Asia-Pacific with a unified and balanced framework for economic cooperation. An analysis of ASEAN–China economic relations suggests that RCEP’s entry into force in 2022 marked a turning point, facilitating institutional modernization, improved market access for goods, services, and investment, and the early onset of structural shifts.

The agreement has demonstrated a positive impact on trade in goods—particularly in sectors that benefited from accelerated tariff reduction—resulting in increased export activity. The regional orientation index confirmed shifts in sectoral priorities and deeper bilateral trade engagement in specific categories. Simultaneously, RCEP stimulated the development of services trade, not only in terms of volume but also through the expansion of sectors such as digital, financial, and telecommunications services. The use of positive and negative list approaches enabled differentiation in openness levels, with countries applying a negative list offering the highest degree of market transparency.

In the area of investment, RCEP marked a critical step toward institutionalization: the adoption of a negative list, the removal of restrictions, protection against expropriation, and commitments to investment facilitation enhanced the predictability of the investment environment. FDI volumes increased in both directions—into China and from Chinese companies into ASEAN. The most active sectors were manufacturing and the digital economy. However, persistent challenges, including geopolitical risks, competition from Japan and the United States, and regulatory constraints within individual countries, necessitate continued bilateral and multilateral engagement.

Overall, RCEP operates beyond the scope of a free trade agreement, functioning as a strategic framework for promoting long-term institutional development throughout the region. It provides ASEAN countries and China with tools to enhance the resilience, flexibility, and technological sophistication of regional integration in an era of global uncertainty.

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Specifics of Intercultural Communication Between Russia and Brazil and the Development of an Online Course
Особенности межкультурной коммуникации между Россией и Бразилией и разработка онлайн-курса

Abstract

This paper explores the unique aspects of intercultural communication between Russia and Brazil within the framework of increasing global interconnectedness. The study focuses on identifying key cultural differences and similarities that influence communication between representatives from the two countries. The theoretical models of Hofstede, Hall, and Lewis are employed to highlight patterns in social behaviour, values, and communication norms. Special emphasis is placed on the practical aspect – designing an educational course based on Telegram with the aim of enhancing intercultural competence among students. Based on a survey of HSE students and an analysis of cultural characteristics, the course has been designed into modules that cater to students' preferences. These modules cover theory, real-life case studies, and communication strategies. The project demonstrates the importance of practical tools in overcoming intercultural barriers and supports the idea that accessible educational formats can foster global understanding. The conclusions emphasize the value of integrating intercultural training into educational programs to promote successful international cooperation.

Keywords: intercultural communication; Russia; Brazil; cultural differences; online course; Telegram; education.

In today's world, intercultural communication has become an essential component of effective international cooperation among countries. With the increasing globalization, interactions among individuals and organizations from different cultural backgrounds have become more complex (Panov, 2019). This has led to a need for a deeper understanding of cultural differences, empathy, and an ability to interpret communication styles and social norms that may be unfamiliar in other countries (Patel et al., 2011). Understanding how others perceive time, hierarchy, personal space, and emotions is crucial in managing modern global interactions in various fields, including business, diplomacy, education, and civil society. This requires a comprehensive understanding of cultural norms and values, as well as the ability to adapt one's communication style to suit different cultural contexts.

Thus, the relations between Russia and Brazil are a vivid example for the study of intercultural communication. Despite the fact that the countries are geographically located far from each other and have certain linguistic differences, they are steadily strengthening their ties in the political, economic and cultural fields. Russia and Brazil, being BRICS members, play a crucial role in their regions (Baryshev, 2013). Their mutual interest in cooperation not only opens up valuable opportunities for both countries, but also highlights the challenges associated with overcoming differences in worldviews and communication skills.

Despite the increasing international connections, communication between Russian and Brazilian individuals can be hindered by cultural differences. These differences include, for instance, varying perspectives on formalities and hierarchies, differing expectations regarding emotional display, contrasting approaches to time management, and diverse verbal and non-verbal communication practices. If these differences are not addressed proactively, they can lead to misunderstandings, confusion, and decreased effectiveness in collaborative efforts (Patel et al., 2011).

Young people—particularly university students and early-career professionals—are increasingly participating in international projects, academic mobility programs, and virtual exchanges. However, they are often unprepared for the subtle complexities of intercultural communication. While many are enthusiastic about global collaboration, they lack accessible tools to help them develop the practical skills and cultural knowledge crucial to engage effectively with peers from other countries.

This article addresses this gap by focusing on the development of intercultural competence between Russian and Brazilian participants. In the course of the work, a comparative cultural analysis was carried out based on well-established theoretical foundations, including Hofstede's dimensions of culture, Edward Hall's context theory, and Richard Lewis' typology of communication. Furthermore, the use of these models provided a comprehensive synthesis of similarities and differences between the two cultures, which formed the basis for the second part of the study, a practical solution in the form of an online educational course broadcast via Telegram channel.

The course was developed based on a survey conducted among students at the National Research University Higher School of Economics (HSE) that revealed a strong interest in Brazilian culture. Additionally, the survey identified a need for structured and engaging educational resources for intercultural learning. In response to these findings, an online course has been developed to address communication barriers between individuals from different countries and provide students with effective tools for interacting in a diverse cultural environment.

When studying the specifics of intercultural communication, it becomes clear that some of the most significant problems of countries interacting with each other are related not only to language barriers but also to deeper cultural codes that determine how people interpret the world around them (Mokeev, 2022). These cultural features, in turn, shape the behavioral patterns, communication strategies, and expectations of representatives of a particular culture. By paying special attention to the most important manifestations of cultural differences in areas such as emotional expression, hierarchical structure, perception of time, and communication context, we can better understand where misunderstandings may arise and how they can be eliminated.

One of the most influential frameworks for analyzing national cultural values is Geert Hofstede’s model of cultural dimensions (Hofstede et al., 2010; Zainuddin et al., 2018). Both

Russia and Brazil exhibit a high power distance, indicating that inequality and hierarchy are accepted as natural and expected. However, while Russians frequently view hierarchical structures as closely linked to formal institutional practices and bureaucratic processes (Samarina, 2017), Brazilians tend to navigate hierarchy more informally, relying on personal connections rather than following and obeying rules rigidly (Hofstede Insights). This difference can affect everything from classroom dynamics to negotiation styles: Russian students or professionals might wait for formal permission to speak, while Brazilian counterparts might feel more comfortable speaking freely—even in the presence of authority figures.

Another key point of divergence lies in individualism versus collectivism. Brazil leans strongly toward collectivism: relationships, loyalty to the group, and shared responsibility are valued more than personal independence (Samovar et al., 2013). Russia, although historically collectivist, especially during the Soviet era, has developed more individualistic tendencies in urban and academic contexts (Tsoi & Kochetkova, 2023). This can manifest in differing expectations around teamwork, decision-making, and personal accountability. For example, in a joint project, a Brazilian participant may prioritize group harmony and consensus, while a Russian counterpart may focus more on efficiency and personal initiative.

Another key point of divergence is uncertainty avoidance. While both Russia and Brazil prefer structure and clear rules, they manage uncertainty differently. Russians tend to rely on formal procedures and long-term planning (Tsoi & Kochetkova, 2023), whereas Brazilians often navigate ambiguity through personal connections and flexibility (Hong & Muniz Jr., 2022). This affects how each culture responds to change and makes decisions in uncertain situations.

A similar contrast appears in the masculinity vs. femininity dimension. Brazil leans toward a feminine culture that values cooperation, emotional openness, and social harmony (Samovar et al., 2013). Russia, by contrast, shows more masculine traits—competitiveness, goal orientation, and a focus on achievement—especially in professional contexts (Hofstede Insights). These values shape expectations in teamwork, leadership, and communication.

In addition to the differences identified in the Hofstede framework, it is also important to consider the two countries from the perspective of Edward Hall's theory of cultural context, which categorizes all cultures into high- versus low-context communication. Both cultures are generally high-context, meaning that communication relies heavily on shared understanding, body language, and implication rather than explicit verbalization. However, Brazilians are often more fluid in adapting their tone and non-verbal behavior to the social situation (Behrns & Karphammar, 2018), while Russians tend to maintain a consistent level of formality (Zavtur, 2017). This becomes especially important in conflict resolution, where Brazilian communicators may rely on diplomacy and emotional cues, and Russians may prefer direct yet polite clarification.

Time orientation is a crucial yet often overlooked aspect of intercultural communication. Both Brazil and Russia are generally seen as multi-active and polychronic cultures, meaning they value relationships over rigid schedules and are comfortable managing multiple tasks simultaneously (Hall, 1959; Lewis, 2010). However, their approaches differ slightly. Brazilians tend to be more improvisational, viewing deadlines flexibly and often prioritizing social interaction during business settings (Samovar et al., 2013). Russians also demonstrate a flexible view of time, especially in informal or hierarchical contexts (Lebedko, 2016), yet in formal or professional environments, they often expect more structure and time discipline. Moreover, Russia's regional diversity adds complexity: while many follow polychronic norms, some ethnic groups lean toward a more monochronic mindset that values punctuality and task focus (Voevoda, 2020). These subtleties can lead to misunderstandings in cross-cultural cooperation if time-related expectations are not clearly communicated.

These differences emphasize the significance of comprehending not only the subtleties of other cultures but also one's own. As noted by Samovar, Porter, and McDaniel (2013), successful intercultural communication commences with an awareness of one's personal habits and assumptions. Therefore, through theoretical knowledge and practical examples, it is possible to better understand cultural differences between countries and develop effective intercultural communication skills.

In order to illustrate the relevance of intercultural competence in the real world, it is useful to consider specific examples of Russian-Brazilian cooperation in key areas such as economics, education and culture. In recent decades, the two nations have actively cooperated to strengthen bilateral relations not only through membership in BRICS, but also through direct cooperation between the two countries. Economically, the partnership includes trade in energy resources, pharmaceuticals, and agricultural products, with Russian companies showing interest in Brazil's infrastructure and logistics sectors, while Brazil exports coffee, meat, and machinery to the Russian market (HSE, 2024). However, such cooperation goes far beyond numbers – it requires negotiation styles, leadership expectations, and business etiquette to align, which can be challenging due to deep-rooted cultural differences.

In the field of education, cooperation has grown through academic exchanges, university partnerships, and scholarship programs (HSE, 2024). Russian and Brazilian institutions participate in joint research projects and student mobility initiatives, especially in international relations, cultural studies, and language programs. However, even if there are official regulations in place, students and teachers may still encounter misunderstandings, which can manifest themselves in both the academic expectations and communication within the classroom. These issues emphasize the need for targeted intercultural training for both parties.

Cultural exchange is an essential area of cooperation that has become increasingly significant for both countries (Embassy of Brazil in Moscow). Russian theatre, music, and literature are frequently presented in Brazil, while Brazilian film, capoeira, and modern art are actively promoted in Russia. These events, such as festivals, exhibitions, and cultural weeks, promote the development of informal communication among representatives of both countries and a better understanding of cultural differences. However, for a deeper understanding, it is essential to consider the context, interpretation, and dialogue. Without adequate cultural mediation, these activities may remain shallow or even reinforce preconceived notions.

In all three areas, it becomes clear that technical agreements or mutual interest alone are not enough. Whether it's business contracts, academic collaboration, or cultural diplomacy, the success of Russian-Brazilian cooperation ultimately depends on the human factor: the ability to navigate different worldviews, adapt communication styles, and build trust across cultural boundaries. Developing intercultural competence, therefore, is a core requirement for sustainable and meaningful international engagement.

To ensure that the online course under development is relevant, targeted, and aligned with the real needs of its intended audience, the project incorporated an empirical research component in the form of a student survey. This survey served as a primary quantitative method and was administered to undergraduate students from a diverse range of academic backgrounds at the National Research University Higher School of Economics.

A structured questionnaire was developed specifically for this research, with the goal of gathering data across five key dimensions:

1) students' self-assessed knowledge and experience with intercultural communication;
2) their awareness of and interest in Russian-Brazilian cooperation;
3) their academic specialization and prior exposure to international studies;
4) their expectations regarding course content (themes, depth, tone);
5) their preferred learning formats and tools.

During the development of the questionnaire, both closed and open-ended questions were compiled to collect quantifiable data and gather insights about students' preferences, expectations, and motivation.

Furthermore, the survey formulations were specially designed to be clear, neutral, and consistent with the daily academic and social experiences of HSE students. The survey was conducted anonymously through internal student communication channels, which allowed respondents to freely share their opinions.

The survey results played a crucial role in shaping the course's content and format. A significant portion of respondents showed only a basic awareness of Brazilian culture, often limited to surface-level associations. At the same time, many expressed uncertainty about how to interpret emotional expressiveness or navigate informal communication – traits commonly associated with Brazilian interaction styles. These responses highlighted the need for dedicated modules on non-verbal cues, politeness norms, and emotional tone.

In terms of format, most students favored concise, mobile-friendly learning over long, text-based materials, confirming the choice of Telegram as the main platform. The participants also emphasized the significance of incorporating practical examples into the curriculum and increasing the amount of visual content. They emphasized the importance of analyzing real-life examples and conducting practical exercises. Additionally, some participants suggested that it would be beneficial to familiarize themselves with the Portuguese vocabulary. This, in turn, contributed to the creation of a Russian-Portuguese dictionary tailored for this online course.

Overall, the survey has not only helped to align the course with the expectations of the intended audience but has also provided valuable insights into how intercultural communication is currently understood among young people. Therefore, the research has gone beyond theoretical considerations and ensured that the online course under development will serve as a valuable resource for anyone interested in intercultural communication.

The choice of Telegram as the main platform for the course is justified by pedagogical, practical and psychological factors (Unisender, 2025). Due to the fact that Telegram is a platform widely used by students for academic, professional and social communication, its implementation in the project is convenient for potential users. The informal and user-friendly design of the platform creates a favorable learning environment that is essential for the development of intercultural competence.

Unlike traditional learning management systems, Telegram offers several advantages over other platforms. In addition to its user-friendly interface, which reduces learning time and enhances course accessibility, it enables the incorporation of various learning formats, such as infographics, flashcards, and surveys, into the learning process. This makes Telegram particularly well-suited for presenting educational materials and allows students to engage with the content at their own pace, contributing to a more personalized learning experience.

The course design is based on the Sequential Approximation Model (SAM), which emphasizes iterative development and student-centered learning. The Telegram platform allows for the effective implementation of this model, as content can be delivered in small, modular segments that can be improved over time based on real-time feedback from users.

Structurally, the course is divided into five thematic blocks:

1) Foundations of Intercultural Communication: an introduction to core concepts, theoretical models, and practical relevance of intercultural competence in today's global environment.
2) Cross-Cultural Analysis: Russia and Brazil: a comparative overview of national values, communication norms, and behavioral patterns that shape interactions between Russian and Brazilian cultures.
3) Economy and Business Cooperation: a focus on current trade relations, joint investment projects, and the cultural aspects of professional communication in bilateral economic partnerships.
4) Academic and Scientific Exchange: an exploration of educational cooperation, student mobility programs, and research collaborations between Russian and Brazilian institutions.
5) Culture and Creative Collaboration: a look into cultural diplomacy, arts-based initiatives, and public events that strengthen mutual understanding and people-to-people ties.

Each module is designed to be visually appealing and easy to navigate—with a variety of quizzes, real-life case scenarios and terminology in two languages. The course is available anytime, anywhere, making it flexible to use. Due to the various content formats and the modern method of presentation, the engagement of students is ensured.

Each module includes short texts, infographics, and interactive practice assignments, which together provide a diverse range of content and help maintain student interest. In addition, the visual design of the course is presented in a minimalist style, with blue as the primary accent color, chosen due to its presence on national flags and association with HSE University, the target audience's educational institution. This color choice, along with the consistent academic tone and organized presentation of materials, contributes to making the course more user-centric and user-friendly. By choosing Telegram, the course combines flexibility, accessibility, and an informal tone with structured content, making intercultural learning natural, personal, and easy to integrate into students' everyday routines.

Intercultural communication has become a core competency in the landscape of international cooperation. As the interaction between countries becomes more intense, the need for individuals to comprehend the cultural backgrounds of their counterparts also increases. This research has demonstrated that while Russia and Brazil may share certain similarities in their cultural profiles—such as a preference for hierarchical organization and a high level of uncertainty avoidance—they differ significantly in their communication styles, expressions of emotion, and expectations in interpersonal and institutional contexts.

These differences, although manageable, require conscious attention and targeted educational support. Miscommunication stemming from cultural assumptions can result in frustration, inefficiency, or even the breakdown of potentially productive collaborations. Therefore, the development of tools that promote intercultural competence, particularly among young people involved in education and professional exchanges, is essential.

The online course developed within this project represents a concrete and practical response to this need. By integrating academic theory with real-world communication scenarios,

The course offers learners a structured yet flexible resource to develop cultural awareness, critical thinking, communication strategies, and essential language tools for navigating intercultural situations. Its delivery via a Telegram channel ensures accessibility and relevance for modern students who are proficient in digital technologies, while its modular design supports both independent and guided learning.

Furthermore, the course illustrates how educational innovation can be used to bridge cultural gaps. Rather than providing abstract guidelines, it focuses on applied knowledge such as case studies, interactive exercises, and language support that helps learners practice what they have learned. By doing so, it encourages reflection, empathy, and the development of a global mindset.

In conclusion, this project emphasizes the importance of integrating theoretical and practical approaches in order to effectively address the complex challenges of intercultural communication. Thoughtful, inclusive, and accessible educational design has the potential to better prepare individuals for meaningful, respectful, and productive interactions in today's increasingly interconnected world.

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Commodity Specialization of Countries as a Factor in Synchronizing the Dynamics of Their Exchange Rates
Сырьевая специализация стран как фактор синхронизации динамики их валютных курсов

Abstract

The purpose of the work is to assess the relationship between the dynamics of exchange rates and the foreign trade specialization in raw materials in the post-crisis global economy. The study is relevant due to the high volatility of commodity markets and the increasing processes of regionalization affecting currency stability. The methodology includes the selection of countries with floating exchange rates, the analysis of their commodity specialization and the construction of correlations between the prices of exported resources and the dynamics of exchange rates. The focus is on New Zealand, Brazil and Madagascar, with data collected by April 2024. The results showed that fluctuations in exchange rates are closely related to changes in commodity prices, especially with a country's strong commodity dependence. In addition, regional integration increases the sensitivity of currencies to market and political shocks. The data obtained confirm the hypothesis put forward about the influence of market and institutional factors on currency dynamics. The work contributes to the study of currency mechanisms in export-oriented economies and may be useful in developing trade and monetary policies in countries with high dependence on raw materials.

Keywords: Commodity specialization; raw material market; floating exchange rate; regional integration; institutional factors; export resources.

At the beginning of the 21st century, the global community became increasingly aware of the weaknesses in the existing economic order. A series of deep crises (the Asian crisis, the dot-com crisis, the 2008 mortgage crisis, and the crisis caused by the consequences of the 2019 pandemic), arising for various reasons, has undermined the stability of the economic, political, and social structure of the global economy.

Perhaps one of the most vivid examples that can demonstrate the changing vector of the modern economic system is the commodity market, which has not only acquired completely new features but has also faced serious threats, resulting in both market and institutional changes.

In today's world, it is difficult to underestimate the significance of such a large market, which over the past 10 years has grown by more than 20 percent and reached 4.38 trillion US dollars. Therefore, during times of serious crisis shocks occurring in various spheres of society, the greatest attention should be paid to changes in the commodity market, which, unfortunately, has been extremely unstable over the past 20 years. This fact is confirmed by the excessively high price volatility of various groups of commodity goods, as well as the ambiguous situation in the food market after the food crisis of 2006–2011.

However, the multipolarity of international relations adds its own characteristics to the overall picture of the world economy. Therefore, it is important to understand in which direction the global community is moving, that is, toward globalization or its opposite, deglobalization. By deglobalization, we mean the increasing role of protectionism in its various forms, or the more explicit process of regionalization.

These vectors, however, indicate not only the economic form of interaction between countries but also carry a political context, which has recently had a strong influence on pricing, trade balance components, exchange rates, and, ultimately, the economic growth of a particular country.

These circumstances raise the fundamental question: do changes in the commodity market influence the dynamics of exchange rates, or has the modern global economy become completely controlled by institutional variables? This question is fundamental to this term paper. In the course of the research, we will find constructive justifications for the established world order and a number of solutions to optimize market mechanisms.

The scientific novelty of this term paper lies in a comprehensive analysis of a rather narrow area aimed at obtaining practically important results, showing relevant statistical data and substantiated conclusions on the interdependence of exchange rates and the commodity specialization of countries.

In addition, there is a need to identify clear-cut factors that influence the dynamics of exchange rates in different countries in the post-crisis period. Since the question of the closeness of the relationship between changing commodity prices and exchange rates in the interaction of importing and exporting countries of a particular resource remains open, our work acquires extremely high significance against the backdrop of a multipolar global economy.

Based on the above question, which is the foundation of our work, we can formulate the following research hypothesis: The change in the dynamics of exchange rates occurs due to the direct impact of factors that determine the situation in the commodity market during the studied period.

The aim of the work is to assess the interdependence between the dynamics of exchange rates and the foreign trade commodity specialization of countries.

The early 21st century exposed critical weaknesses in the global economic system. Although the collapse of the Bretton Woods system in the late 20th century had initially cast doubt on the viability of capitalism, a renewed wave of liberalization, driven by the fall of the Berlin Wall, the disintegration of the Soviet Union, and a global shift toward market reforms, reinvigorated international trade and economic integration. Countries such as China, Vietnam, Poland, and the Czech Republic began moving toward market-based systems. While some of these transitions fueled impressive economic growth, others triggered significant social, political, and economic turbulence (Gladkov, I. S. 20216, 16-26).

This period witnessed a surge in international trade agreements and institutional reforms. The creation of NAFTA in 1994 and the transformation of GATT into the WTO during the Uruguay Round represented milestones in multilateral economic cooperation. The European Union (EU) also expanded significantly, welcoming new member states and harmonizing market structures. Technological advances, including the rise of the internet and innovations in logistics and aviation, significantly reduced transaction and transportation costs, further accelerating globalization (Parkhimenko, V. A. 2022. 88-105).

Globalization brought unprecedented benefits: faster capital flows, broader market access, and increased economic efficiency. However, these same mechanisms also gave additional impetus to crises. The 1997 Asian financial crisis was the first sign of systemic vulnerability, followed by the dot-com crash in 2000, the subprime mortgage crisis in 2008, and the global disruption caused by the COVID-19 pandemic in 2020. These events exposed the fragility of interdependent economies and forced many states to reconsider the sustainability of full-scale globalization.

At the same time, political instability, including armed conflicts, trade disputes, and ideological polarization, further complicated global cooperation. Crises in Ukraine, Syria, Yemen, and Afghanistan, among others, have underscored the limits of global political unity and the growing tension between economic openness and national security (Nechai, A. 2006, 77-81).

In this context, regionalization has emerged as a pragmatic alternative. Unlike globalization, which seeks to integrate markets on a global scale, regionalization is based on geographically and economically rational clusters. It emphasizes cooperation among neighboring or similarly developed states, allowing for more effective risk management and policy coordination. Prominent examples include the EU, ASEAN, MERCOSUR, and CARICOM. These organizations support not only trade integration but also institutional alignment, resource access, and monetary stability (Dmitrieva, M. A. 2015, 1-14).

A key distinction can be made between horizontal and vertical integration. Horizontal integration refers to equal, mutually beneficial relationships among states aiming to reduce trade barriers and harmonize standards. Vertical integration, on the other hand, often involves asymmetric relationships, where more developed countries invest in or guide the economic development of others, frequently prioritizing their own interests.

The growing role of regional groupings also reflects a rise in protectionist policies, particularly among developed nations. The EU, United States, and Japan increasingly implement agricultural subsidies, investment restrictions, and strategic trade policies. Collective protectionism, such as customs regulations within economic blocs, has also become more pronounced. Policies like France’s support for local green energy industries or China’s "Made in China 2025" initiative exemplify a new wave of internal economic prioritization, valid even within global systems.

These developments suggest that modern global cooperation is not monolithic but dualistic. On the one hand, supranational institutions and trade networks continue to function and expand. On the other hand, the proliferation of regional alliances and nationalistic economic strategies reflects a shift toward selective integration, driven by resilience and national interest rather than idealistic globalization.

The implications of this trend are critical to understanding currency dynamics and trade specialization. As states consolidate their trade relations within regional frameworks, their exchange rates may be linked predominantly to regional factors, such as commodity flows and partner demand, rather than global fluctuations. Thus, the currency of a commodity-exporting nation may increasingly depend on the economic behavior of a key regional importer or ally.

This shift toward regional economic systems raises new questions about how commodity specialization affects exchange rates and whether global institutions or regional dependencies exert greater influence. It is this transition from global to regional economic logic that forms the central hypothesis of our study: exchange rate dynamics in the post-crisis world are increasingly shaped by commodity trade specialization and regional trade patterns, rather than by global market forces alone.

To investigate this, we propose segmenting countries into analytical clusters based on geographic, trade, and institutional proximity. These clusters will form the basis for examining the relationship between external trade specialization and currency behavior in subsequent sections of this research.

To understand trade specialization among countries, it is essential to identify the market and product types under analysis. This study focuses specifically on the global commodity market, a dynamic system of trade relations shaped by economic, political, and environmental factors. Commodity markets encompass energy resources, agricultural products, and metals, all of which have experienced extreme price volatility, speculative activity, and geopolitical disruption in recent decades.

The 21st century has brought dramatic changes to global supply chains (Rebenok, L. S. 2015, 27-45). Following a wave of liberalization and globalization in the late 20th century, a counter-trend of regionalization has emerged. Driven by geopolitical tensions and economic instability, countries have increasingly relied on geographically clustered trade blocs to safeguard supply security and mitigate external shocks. The Ukraine crisis, Western sanctions against Russia, and a broader shift toward a multipolar world economy have all contributed to a reorientation of trade routes and patterns. At the same time, sustainable development goals, climate risks, and food security concerns have expanded the regulatory scope of commodity trade, especially in agriculture, energy and raw materials production.

Despite global crises, commodity trade volumes have continued to grow. Since 2000, merchandise exports have increased 2.83 times, and imports by 2.79 times, with 25 leading economies—such as the U.S., China, Germany, and Japan—accounting for over 80% of total trade value (Belov, K. K. 2017, 174-180). However, these headline figures mask deeper asymmetries in specialization. To assess this, it is necessary to distinguish between finished goods (e.g., machinery) and primary commodities (e.g., crude oil, wheat), which form the analytical core of this paper. These tradable raw materials, often referred to as "exchange-traded commodities," are the foundation of many developing economies' trade strategies (Fadeeva, E. A., & Pak, A. V. 2021, 74). Key categories include: Energy resources (oil, coal, natural gas); Metals (copper, aluminum, nickel); Grains (wheat, corn); Oilseeds (soybeans, cottonseed); Others (rubber, coffee, etc.).

This market segment is susceptible to supply shocks, demand fluctuations, and political interference. Speculation has emerged as a particularly destabilizing factor, prompting efforts, such as those under UNCTAD, to strengthen transparency and multilateral oversight.

Global specialization patterns are underpinned by the classical theory of comparative advantage, articulated by David Ricardo. According to this principle, countries benefit from focusing on the production and export of goods they can produce at relatively lower opportunity costs, while importing those with relatively higher domestic costs. This enhances productivity and economic efficiency, even for nations with overall lower levels of development.

Empirical evidence supports this claim. For example, countries in Central and Eastern Europe (CEE)—including Poland, Hungary, and the Czech Republic—shifted rapidly toward free-market systems and saw an uptick in industrial output. Poland's export profile includes electricity and mining products; Hungary and the Czech Republic specialize in car manufacturing and have attracted substantial FDI from automotive giants such as Volkswagen and Mercedes-Benz. Although considered developing economies in some contexts, these nations exhibit export structures dominated by services and manufactured goods, rather than raw commodities.

In contrast, New Zealand—a developed, high-income country—illustrates a different model. It maintains a strong focus on primary commodity exports, notably agricultural products, which account for nearly 60% of its outbound trade. Despite its technological advancement, New Zealand leverages its natural endowments and trade agreements (e.g., with China) to compete globally in raw materials.

These examples demonstrate that specialization is not always tied to income levels. Political orientation, geographic constraints, technological capabilities, and institutional frameworks all shape export strategies. Moreover, specialization allows countries to reinvest export revenues into sectors where domestic production is inefficient, fostering broader development.

Thus, trade specialization—particularly in commodities—remains a cornerstone of national economic strategy. Whether through services, manufacturing, or raw material exports, countries structure their trade based on a combination of natural advantages and strategic choices. In this context, analyzing the interplay between specialization and exchange rate dynamics offers critical insights into functioning and fragility of modern global economy.

Having previously explored global commodity markets and international trade, including their structure and the implications of commodity specialization, this section turns to the second critical element of our study: the foreign exchange market and the dynamics of exchange rates. Since the core objective of this research is to assess how changes in commodity markets affect exchange rate fluctuations, a theoretical understanding of currency systems is essential.

The global foreign exchange market (Forex) is a decentralized system where participants exchange one national currency for another. While sharing some similarities with organized exchanges, Forex operates electronically and lacks a central trading venue, classifying it as an over-the-counter (OTC) market (Bukhvostova, Y. O. 2006, 76-78). Its participants range from central banks and commercial banks to brokerage firms, corporations, and private individuals. The market has grown exponentially, with daily turnover increasing from around $5 billion in 1977 to nearly $10 trillion in 2020.

Despite London's dominance in global FX trading (handling over 36% of total transactions), the U.S. dollar (USD) remains the most traded currency, followed by the euro (EUR), Japanese yen (JPY), Swiss franc (CHF), and British pound sterling (GBP). Other important trading centers include the U.S., Japan, Singapore, Switzerland, Hong Kong, and Australia.

To assess currency behavior, it is necessary to define what constitutes currency and exchange rate systems. A currency is the legally recognized unit of money in a given country, used for valuation, exchange, payment, and savings. Exchange rates reflect the value of one currency in terms of another and can be classified as either nominal or real. The nominal exchange rate indicates market price, while the real exchange rate adjusts for inflation differentials between countries.

Exchange rates also differ by convertibility:

1. Freely convertible currencies (e.g., USD, JPY, GBP, CHF) can be exchanged without restrictions.
2. Partially convertible currencies (e.g., RUB, CNY) are subject to limitations.
3. Non-convertible currencies (e.g., North Korean won) are restricted to domestic use only.

Numerous long- and short-term factors influence exchange rate movements, including interest rate changes, inflation levels, current account balances, export strength, market development, and investor confidence. Political events, natural disasters, and speculative actions also introduce volatility (Kostenko, R. V., & Grigorieva, E. V. 2018, 15).

Particular attention should be paid to exchange rate regimes. In a floating regime, the central bank refrains from intervention, allowing the currency to fluctuate based on market forces. In contrast, a fixed regime involves pegging a national currency to another, such as the USD, with central bank intervention to maintain stability. For the purposes of this research, only countries with floating exchange rates are considered. These include Australia, Brazil, Canada, Hungary, Indonesia, Japan, Mexico, New Zealand, Poland, South Africa, Sweden, the United States, and others.

The floating regime is essential for our methodology because it allows for the identification of genuine market-driven currency fluctuations. Fixed regimes mask this effect due to government control, thereby distorting empirical outcomes.

To validate the hypothesis that exchange rates in resource-exporting countries are influenced by global commodity price shifts, we began with a methodical selection of countries for empirical analysis. The core criterion was the use of a floating exchange rate system, as only in such economies can we clearly observe the influence of market forces—particularly commodity price volatility—on national currencies, without distortions caused by central bank interventions.

Other crucial criteria included data transparency and macroeconomic stability. Nations experiencing institutional crises, hyperinflation, or those subject to global sanctions (e.g., Russia or Iran) were excluded due to the unreliability and distortion of macroeconomic indicators. Thus, we focused on countries that provide consistent access to statistical information and maintain predictable trade and currency policy environments.

Moreover, the selected country should have a large share in the import / export of the second, in relation to which we are looking at the exchange rate, for example RUB / CNY.

Our sample is also limited by the fact that we consider only the commodity market. However, as said above, not all countries have a specific specialization in raw materials. Therefore, it is fair to note that countries with a low share of commodity exports cannot meet the requirements of this research, as the analysis will show an unreliable result.

Having dealt with the main criteria that will help us construct the most representative sample, we can identify the following countries for our analysis:: 1) New Zealand 2) Australia 3) Madagascar 4) Brazil 5) Japan 6) Mexico It should be noted that New Zealand, Madagascar and Brazil are the main countries for our analysis, since it is in the exports of these countries that a large proportion of raw materials prevail. Moreover, they have large and reliable partners, so changes in prices for their specialty goods should have an observable impact on the dynamics of the exchange rate with countries such as the United States, Japan, Australia, and Mexico.

Three diverse countries were selected: New Zealand, Brazil, and Madagascar. These nations differ across multiple axes, such as continent, economic development stage, export volume, and commodity dependency, allowing for a robust, representative sample. New Zealand, a developed nation, demonstrates a high dependency on agricultural and dairy exports. Brazil, a large emerging economy, is a global leader in iron ore, oil, and soy exports. Madagascar, although less economically advanced, possesses a niche specialization in vanilla, cloves, and several key minerals. Each of these countries operates under a floating exchange rate system, enabling accurate observation of currency responses to market shifts.

Furthermore, the selected countries reflect a spectrum of export dependency. For instance, in Madagascar, a narrow export base causes bigger exposure to price fluctuations, whereas New Zealand's diversified agrifood exports offer a more balanced risk profile. Brazil, with its dual reliance on agriculture and energy, occupies a middle ground in volatility and complexity. This selection framework allowed us to assess the relationship between exchange rate trends and the structure of trade specialization in varying economic contexts.

In the second stage, we examined how global commodity price movements correlate with fluctuations in national currencies. The analysis relied on comprehensive indices representing different sectors—such as the FAO Food Price Index, World Bank Metals and Minerals Index, and the Energy Price Index—rather than individual commodity prices. This approach accounts for macro-level trends that shape market expectations and impact countries with high commodity export ratios.

New Zealand's dollar, for example, showed significant sensitivity to changes in the Food Price Index, especially during 2022–2023, when dairy and meat prices surged globally. This correlation reinforces New Zealand’s identity as a food-exporting economy and supports the thesis that sector-specific price trends drive currency movements.

Brazil’s currency reflected responsiveness to both the Energy and Metal Indices. In 2021 and 2023, as crude oil and iron ore prices rose due to global supply chain disruptions and geopolitical instability, the Brazilian real appreciated noticeably, reflecting heightened export revenues and improved trade balance.

Madagascar, though a smaller economy, also displayed noticeable patterns. Its high dependency on niche agricultural exports, such as vanilla, made it especially sensitive to speculative price cycles.

During a 2021 vanilla supply shortage, for example, the Malagasy ariary appreciated against major currencies, demonstrating the strong link between export performance and currency strength even in developing markets.

Across all three case studies, the data consistently showed that commodity price increases result in appreciation of national currencies, supporting the idea that resource-linked export surpluses affect forex markets. The underlying logic is that higher commodity prices boost trade balances, increase demand for domestic currency, and lead to capital inflows, all of which strengthen the exchange rate. Thus, our findings align with traditional macroeconomic theories of trade and currency valuation, including the terms-of-trade effect and purchasing power parity.

In the final phase, we operationalized our theoretical insights using regression and correlation analysis to determine whether sector-specific commodity indices can statistically explain fluctuations in nominal exchange rates. Exchange rate data (2020–2024) were collected for each country relative to its key trading partner: New Zealand with Australia, Brazil with Mexico, and Madagascar with Japan. These pairings were selected based on trade volumes and currency convertibility.

For New Zealand, regression results revealed a strong positive correlation ($R^2 \approx 0.71$) between the FAO Food Index and the NZD/AUD rate. This reinforces the idea that rising global prices for agricultural exports translate into increased foreign demand for New Zealand’s goods, appreciating its currency.

In Brazil, the real showed a medium-to-high correlation ($R^2 \approx 0.64$) with both the Energy and Metal Indices. While more volatile due to domestic political factors and financial market fluctuations, the overall trend confirmed the hypothesis: higher oil and mineral prices typically supported the real’s strength, especially in 2021–2022.

Madagascar’s exchange rate (against the Japanese yen) showed a moderate but significant correlation ($R^2 \approx 0.47$) with specialty food price indices. Despite its limited market size, vanilla price surges (2021, 2023) led to temporary currency appreciation. These findings demonstrate that even small economies with narrow specialization can experience currency shifts triggered by commodity shocks.

Collectively, the regression results supported the hypothesis that commodity-exporting countries under floating exchange rate regimes are sensitive to sector-specific price movements, with degrees of responsiveness shaped by their trade structures and macroeconomic resilience. The strength of the correlation varied depending on export diversification, volume, and institutional capacity, but the direction of influence was consistent across all three countries.

Having examined the main trends present in the commodity market in the post-crisis period, we have come to the conclusion that the process of regionalization plays a significant role in the development of states in the modern world.

Thus, countries, uniting into economic groupings, often based on geographical principles, form the main vector of their development by specializing in the most advantageous industries for production and export. This not only increases their economic efficiency, but also prevents the spread of negative consequences from economic shocks.

In this work, we have not only considered such concepts as exchange rate, specialization, regionalization, and the Forex market, but also carried out a comprehensive analysis of the interdependence between the dynamics of exchange rates and market factors in the commodity market.

As statistical data and correlation coefficients have shown, the formation of the exchange rate is indeed influenced by market forces—namely, changes in commodity prices and levels of supply and demand, which confirms the hypothesis we put forward.

In order for our analysis to be as reliable as possible and for us to be able to confidently speak about the acceptance or rejection of our hypothesis, we had to make a representative selection of countries, based on a large number of criteria, where, undoubtedly, the main factor was the floating exchange rate regime.

Having examined the commodity specialization of each selected country (New Zealand, Brazil, and Madagascar), and also compared the dynamics of their exchange rates with the currency of their most significant importer (Australia, Mexico, Japan), we were able to conduct an in-depth analysis, thereby providing the most relevant data (with indicators analyzed up to the end of April 2024) on the interdependence of the dynamics of exchange rates and the commodity specialization of countries.

This fact confirms the scientific novelty and relevance of our work**.**

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Comparative Analysis of ESG Strategies in Japanese Automobile Industry in 2020-2025

Сравнительный анализ ESG стратегий японских автопроизводителей в 2020-2025 гг.

Abstract

The research examined features of ESG strategies initiated by top Japanese automakers such as Toyota, Nissan, Mazda, Honda, Suzuki, Subaru, Isuzu, Yamaha and Mitsubishi. Even though various aspects of sustainable development are well-covered in academic literature, no research was conducted on the principal differences in the realization of ESG policies among the automakers mentioned above; therefore, the current paper is dedicated to previously unnoticed fields. In order to provide a detailed overview, both quantitative and qualitative methods of analysis were utilized. Content analysis of annual non-financial reports was applied to provide an insight into the differences in prioritization of three main ESG aspects - environmental, social and governance - among the companies. Statistics on green bonds issued by the companies and data from open sources formed the basis of quantitative analysis. In the research, it is anticipated to underline distinct features of Japanese automakers based on the level of internalization, total assets, number of industry sectors operated in, and other factors.

Keywords: ESG; Japan; automobile industry; sustainable development.

Environmental, Social, and Governance (ESG) is a framework used to evaluate a company's sustainability and societal impact. Since the introduction of the term by the United Nations (UN) in 2004, leading companies worldwide have been actively developing ESG strategies in order to increase investment appeal for the foreign markets (IBM, 2023). Although the main principles of sustainable investing locally existed since the second half of the 20th century, the introduction of ESG boosted a global trend for sustainable development.

The financial sector is a leader of ESG development. Thus, «Principles for the effective management and supervision of climate-related financial risks», which were introduced by the Bank for International Settlements (BIS) in 2022, is a set of principles recommended to follow for the successful implementation of ESG-oriented programs in business (Bank for International Settlements, 2024). Based on the document, «Non-financial Reporting Standards» were enacted by the Ministry of Economic Development of Russia the following year, underlying the significance of ESG development for all sectors of the economy in our country (Ministry of the Economic Development of the Russian Federation, 2023).

According to the Risk Watch Initiative, Japan occupies 33rd place among 177 countries, leaving China, Russia, the USA, the UK and other countries behind (Risk Watch Initiative, 2023). The predominant share of ESG programs in Japan are aimed at preservation of the environment, tackling climate change, ensuring biodiversity and other environmental aspects of ESG with social and governance lagging behind. Considering the high involvement of the Japanese companies in international trade – the 4th exporter by value in the world (Statista, 2023), – scientific research of ESG practices in the industry of Japan can be insightful. The automotive manufacturing industry of Japan accounts for 2.9% of national GDP and 13.9% of manufacturing GDP. Considering its economic significance for the whole country and active following of the sustainability trends by the Japanese companies, analysis of the automobile manufacturers potentially provides a deep understanding of the way ESG transforms the economy (The International Trade Administration, 2025). Furthermore, a variety of traditional sustainable practices of Japan, such as mottainai (a centuries-old Japanese philosophy that embraces the idea of respecting the resources and their value while also reducing waste), pose additional insights into ESG policy implementation, especially for Western companies, including Russian ones (Japan Up Close, 2023).

The objective of the research is to identify the main differences among selected Japanese car manufacturers in the implementation of ESG policies. In order to achieve the objective, qualitative analysis of Green Bonds, issued on the Tokyo Stock Exchange (JPX), and ESG rankings, as well as benchmark analysis of ESG policies by the leading Japanese automobile manufacturers, are utilized.

Japan is the fourth largest automotive market in the world after China, the United States, and India. In order to provide a deeper overview, apart from the leaders of the automobile exports and industry in general, such as Toyota, Honda, Nissan and Suzuki (Factory Warranty List, 2025), analysis of ESG policies by medium-scale companies is provided as well, thereby making it possible to presume to what extent participation in the international market affects the ESG policy of Japanese automobile companies. Therefore, the research is conducted about the following companies: Toyota, Honda, Nissan, Subaru, Mazda, Mitsubishi, Kawasaki, Suzuki, Yamaha and Isuzu.

In order to provide an objective evaluation of ESG performance, ESG ranking is utilized in the research. The LSEG ranking provides open data with division by each aspect of ESG performance, thereby, ensuring the analysis of environmental, social and governance aspects separately in each company.

The average overall ESG score of selected Japanese automobile companies is 71 points, which is entitled as "good" performance according to LSEG. Nonetheless, Swedish Volvo, being the leader of the ranking in the industry, leaves Japanese companies way behind with 88 points (KnowESG, 2025). Furthermore, ESG scoring among the selected Japanese companies varies greatly, from 60.7 by Suzuki to 81.7 by Nissan, underlining essential differences in their performance and significant capacity for improvement of the policies (Figure 1).

The main trends include the high significance of environmental aspects, following the national trend in Japan, identified by McKinsey Sustainability (McKinsey, 2021). Social and governance aspects are lagging behind with significantly poorer performance, which is mainly caused by biased attitudes towards innovation in management (Arhinful, 2024, pp. 397–414) and the disadvantaged position of women in the labor market, with Japan ranking

118th of 146 countries in the Global Gender Gap Index 2024 (World Economic Forum, 2024).

Although 3 out of 4 key exporters mentioned prior are in the top-5 list by ESG ranking, such companies as Mitsubishi and Isuzu, while being less export-oriented, are still outperforming them, occupying 2nd and 5th place among selected companies, respectively. However, from the point of the overall average, less export-oriented manufacturers are scoring less by 1.5 points, which can be caused by stronger appeal for ESG worldwide, pushing highly internationalized Japanese companies to follow those principles more vigorously.

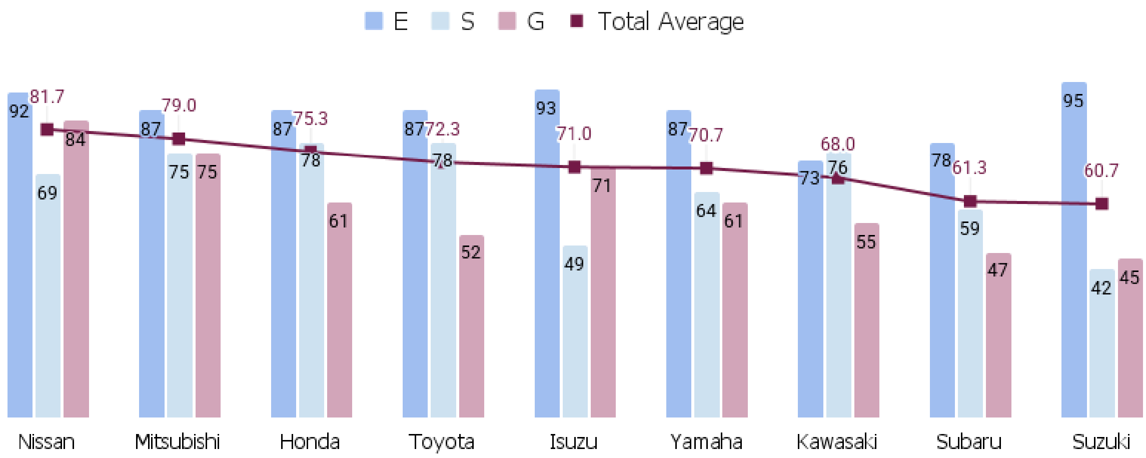

Figure 1. LSEG Rating of Selected Japanese Automobile Manufacturers by Category of ESG in 2024 (source: LSEG)

Green bond issuance is a way to attract investments for the development of ESG programs, which is also worth analyzing in the research. Although sustainability strategies have been implemented by some of the companies for more than 20 years (e.g., Honda, Suzuki, Kawasaki, etc.), the first green bonds were issued on the Tokyo Stock Exchange (JPX) only in 2021, underlining the trend for internal financing of ESG projects (Japan Exchange Group, 2025).

Due to the lack of depth in data, no particular trend in green bond issuance by car manufacturers can be identified. Nevertheless, car manufacturers occupy a 7% share in the total value of green bonds issued in Japan between 2021 and 2025, marking an active investment flow in ESG, with 2023 reaching a climax (Figure 2).

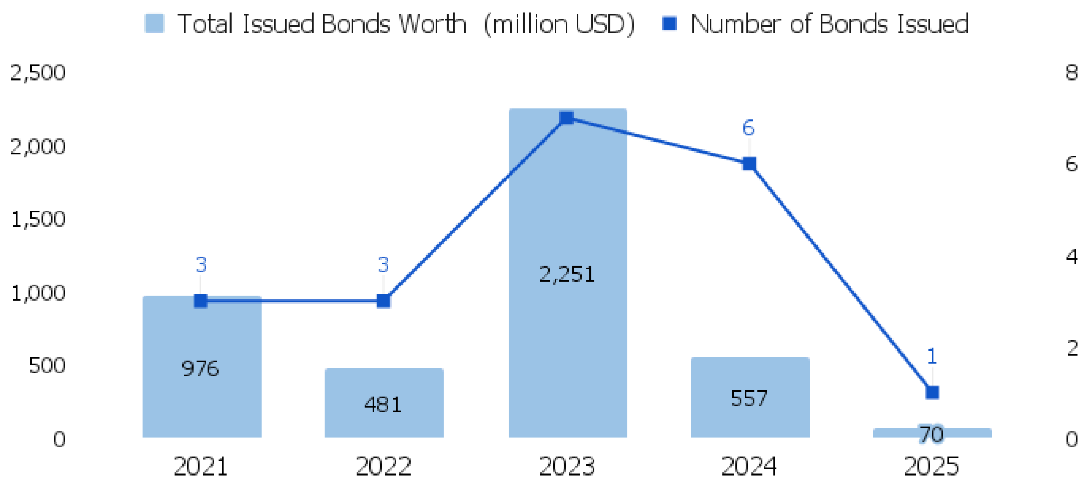

Figure 2. Green Bonds Issued by the Selected Japanese Automobile Manufacturers between 2021 and 2025, Year Division (source: Tokyo Stock Exchange)

Among 4 main exporters of automobiles, only Toyota and Nissan are in the top 5 rankings of companies by green bonds issued between 2021 and 2025 (Figure 3). Although green bonds issued by those companies account for almost 75% of the total value, it is surprising that the companies with less participation in world trade are actively attracting green investments as well.

Issuance of green bonds by the companies less engaged in international trade can be caused by high demand of local residents in precious bonds of Japanese automobile manufacturers (Nazarova, V., Lavrova, V., 2022). In order to validate the hypothesis, further survey of Japanese investors' behaviour towards green bonds and financial products in general is required.

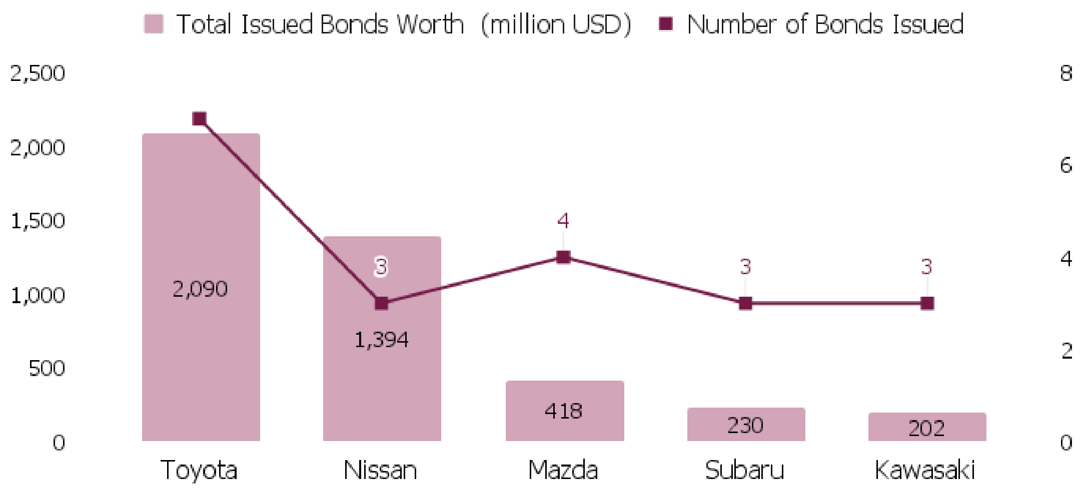

Figure 3. Green Bonds Issued by the Selected Japanese Automobile Manufacturers between 2021 and 2025, Company Division (source: Tokyo Stock Exchange)

The influence of the main export destinations on the ESG strategy features should also be considered. Based on the fact that European and American companies are the main contributors to ESG in the world, it is presumed that European consumers put more emphasis on environmental, social and governance aspects, while consumers of Middle Eastern and Asian countries do not demonstrate such behaviour (Chen, 2023).

Nissan and Mitsubishi export more than half of their automobiles to North America, Honda to Europe, and Yamaha to Asia. In the cases of Toyota, Isuzu and Suzuki, no predominant export destination can be identified (Figure 4). There is also no available data on Kawasaki exports by destination.

As was mentioned prior, European and American consumers could be more sensitive towards ESG practices due to the high level of contribution in the field by local companies. Based on the fact, a slight influence of export destinations on the ESG strategy can be identified (Li, Q, 2024). Thus, Nissan, Mitsubishi and Honda occupy 1st, 2nd and 3rd places in ESG ranking among selected Japanese companies, respectively, while predominantly exporting their products to Europe and North America – regions that are considered to be more sensitive towards ESG policies. Diversity of export destinations by Toyota, which occupies only 4th place in the ranking, may be the reason for less effective ESG policies (Figure 4).

There is also an exclusion to this trend. Thus, one of the main export destinations of Suzuki is Europe, with around 46% of automobiles shipped in the region. However, the company is at the bottom of the ESG ranking among selected Japanese automakers with only a 60.7 overall score. There is a significant gap between different aspects of ESG as well with governance and social scoring less than half of environmental.

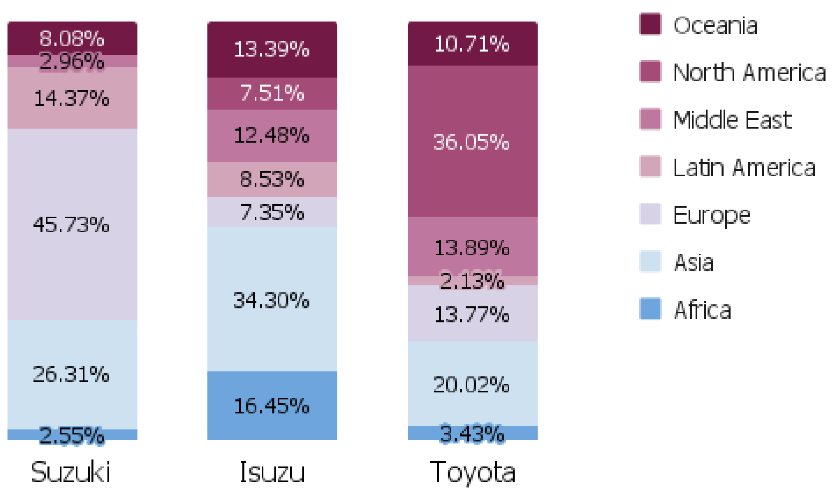

Figure 4. Suzuki, Isuzu and Toyota Exports Structure in Volume of Units by Region in 2020-2024 (calculated based on the annual sales reports of the selected Japanese automobile companies)

Total ESG scores by 9 Japanese automobile manufacturers selected for the study represent 1716 points, with 706, 514 and 496 accounting for environmental, social and governance aspects, respectively (Figure 5).

The predominance of the environmental aspect in the ESG performance of the selected companies can be caused by the prioritization of energy efficiency and high investments into the development of automobiles on non-fossil fuels (e.g., electricity, hydrogen, ammonia, etc.) by Japanese companies since the oil shocks of the 1970s (Aoki, 2023). Thus, 12 of 17 non-EV cars presented in the fuel-efficiency ranking provided by the U.S. Department of Energy were manufactured by Japanese companies (9 units of Toyota, 3 units of Honda) (U.S. Department of Energy, 2025).

However, selected Japanese companies demonstrate by far less effective performance in two other aspects of ESG. As it was mentioned prior, biased attitudes towards innovation in management (Arhinful, 2024, p. 397–414) and the disadvantaged position of women in the labor market (World Economic Forum, 2024) can be identified as the main reasons for this.

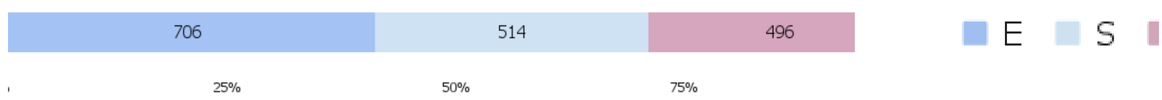

Figure 5. LSEG Overall Rating of All Selected Japanese Automobile Manufacturers in 2024 (source: LSEG)

The research evaluates the ESG performance of major Japanese automakers, including Toyota, Honda, Nissan, and Suzuki, alongside mid-sized firms and potential factors affecting it.

On average, Japanese automakers score 71 out of 100 in ESG performance, classified as "good" by LSEG standards. However, they lag behind global leaders like Sweden's Volvo, which scores 88. Among Japanese companies, Nissan leads with 81.7, while Suzuki ranks lowest at 60.7, underlining essential differences in their performance and significant capacity for improvement of the policies. The analysis reveals a strong focus on environmental initiatives, aligning with Japan's national sustainability trends, but weaker performance in social and governance aspects. This gap is attributed to resistance to management innovation and gender inequality, with Japan ranking 118th in the Global Gender Gap Index of 2024.

Interestingly, while top exporters (Toyota, Honda and Nissan) dominate ESG ranking, less export-focused firms like Mitsubishi and Isuzu also perform well, ranking 2nd and 5th, respectively. However, less internationalized manufacturers score 1.5 points lower on average, suggesting that global exposure may drive stronger ESG adoption.

A key trend is the growing issuance of green bonds to fund ESG projects. Although Japanese automakers like Honda, Suzuki and Kawasaki have had sustainability strategies for over 20 years, the first green bonds were only issued in 2021 on the Tokyo Stock Exchange (JPX). Automakers account for 7% of Japan's total green bond value (2021-2025), with Toyota and Nissan contributing nearly 75%. Surprisingly, some less internationally focused firms also actively issue green bonds, possibly due to strong investor demand in Japan.

Export destinations may also influence ESG strategies. Companies like Nissan, Mitsubishi, and Honda —which primarily export to such regions with strong ESG expectations as North America and Europe — rank highest in ESG performance. In contrast, Toyota, with more diversified exports, ranks 4th, while Suzuki, despite 46% of exports going to Europe, scores poorly, particularly in governance and social criteria.

Overall, Japanese automakers excel in environmental sustainability, driven by decades of investment in energy efficiency and non-fossil fuel automobiles (e.g., electric and hydrogen vehicles). However, performance in social and governance aspects remains weak due to traditional corporate structures and gender disparities. The findings suggest that while global market pressures encourage stronger ESG policies, domestic challenges persist, requiring further reforms to improve overall performance

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Modeling the Behavior of Competitive Agents Based on Artificial Intelligence Methods

Моделирование поведения конкурирующих агентов на основе методов искусственного интеллекта

Abstract

This work is dedicated to the development of a simulator for modeling the behavior of competitive agents in adaptive systems. Modern video games and autonomous control systems require the modeling of agents' behavior, capable of adapting to changes in the environment and interacting with other agents. The main goal of the work is to create a simulator that will model the behavior of a competitive agent in dynamic conditions, where agents must adapt their strategies based on changes in the external environment.

To achieve this goal, Unity3D is used in conjunction with the ML-Agents library. Unity3D allows for the creation of complex 3D scenarios and physical models, which is crucial for the realism of the simulator. The ML-Agents library provides tools for integrating machine learning methods, enabling agents to learn through interaction with the environment. Thus, the development of a training environment using these technologies will facilitate the modeling of adaptive behavior in agents under uncertain conditions.

Keywords: Competitive agent; adaptive systems; reinforcement learning; Unity3D; ML-Agent; dynamic environments.

In modern video games, artificial intelligence (AI) has become one of the key tools for creating high-quality gameplay. The application of AI technologies is particularly relevant in racing simulators, where the behavior of virtual opponents directly impacts player engagement and realism, as confirmed in article (Yannakakis G. N., Togelius J., 2018).

Traditional approaches to AI in games are often limited by predefined behavior scripts, making virtual opponents predictable. In this context, agents are AI-controlled virtual characters or entities. As mentioned in the article (Mnih, V., Kavukcuoglu, K. et al., 2015), to enhance the adaptability of their behavior, the implementation of modern methods such as reinforcement learning (RL) and machine learning algorithms is necessary. The application of these approaches opens new possibilities for racing simulators. Modern methods like RL allow for the creation of not only realistic opponents but also unique gameplay scenarios where each race becomes unpredictable (Evans B.D., Engelbrecht H.A., Jordaan H.W., 2023).

The goal of this research is to develop a simulator for modeling the behavior of competing agents capable of adapting to environmental changes and opponent strategies. A multi-stage approach is used to achieve this goal. First, an analysis of existing solutions was conducted, focusing on adaptive algorithms such as Proximal Policy Optimization (PPO) and Soft Actor-Critic (SAC). Next, a training environment was created using Unity3D and the ML-Agents library, which simplifies the integration of RL into game environments. As noted in the Unity ML-Agents documentation, this combination enables flexible and dynamic agent training. The environment is designed so that agents can interact with their surroundings, learn from experience, and develop complex strategies.

Modern research in modeling competing agent behavior in dynamic environments relies on a combination of machine learning methods, game mechanics, and physical simulation. A key challenge remains creating agents capable of adapting to environmental changes and other participants' strategies while maintaining realism and balance in competitive scenarios. In classic racing simulators like Need for Speed, AI agents use predefined behavior scripts based on waypoints and splines. As noted in work (Betz J., Zheng H. et al., 2022), these methods ensure stability but make opponent behavior predictable, as splines define fixed trajectories, limiting adaptation to dynamic changes.

To maintain interest in arcade games like Mario Kart, mechanics such as Rubber Banding and Catch-Up are applied, artificially regulating agent speeds. However, such approaches reduce realism and are unsuitable for simulators where the accuracy of physical models is crucial. Breakthrough systems based on machine learning have also emerged, such as Sony AI's GT Sophy, which uses deep reinforcement learning. GT Sophy agents can compete with professionals thanks to their adaptability, but training requires significant computational resources. Another example is the Drivatar system from Forza Motorsport, which mimics a player's driving style but can reproduce undesirable patterns, such as aggressive driving.

Reinforcement Learning (RL), integrated via the ML-Agents library in the Unity3D game engine, allows agents to learn through interaction with the environment. This library supports multi-task learning, but key challenges remain: tuning the reward system and ensuring training stability in highly dynamic conditions. For example, balancing speed and collision avoidance requires careful design of the reward function, as shown in the article (Evans B., Engelbrecht H.A., Jordaan H.W., 2021).

Current tasks include combining methods (e.g., using splines as initial guides for RL agents). The simulator being developed on the Unity3D and ML-Agents platforms proposes an architecture combining physical accuracy and RL adaptability, as well as a dynamic environment with parameterizable events. Such simulators serve as research tools, bridging the gap between realism and adaptability, opening new possibilities for game AI and autonomous systems (Johnson J.D., Li J., Chen Z., 2000).

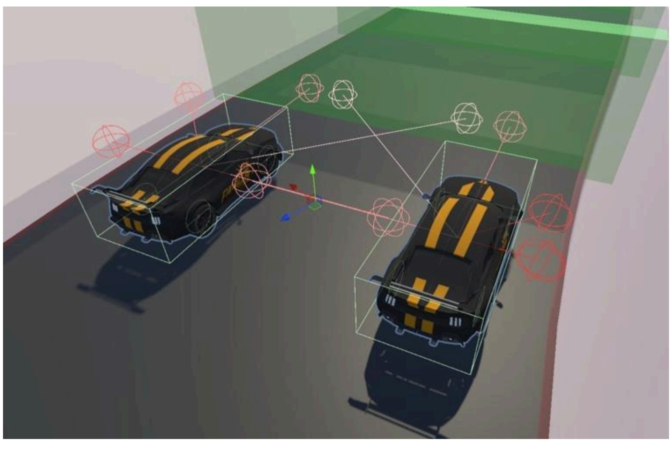
To implement a simulator for competing agent behavior in an adaptive self-governing system, components focused on agent modeling and training in dynamic environments were selected. One of the core training components is RL, chosen for its effectiveness in modeling agent learning through environment interaction. RL allows agents to adapt to environmental changes and competitor strategies, which is critical for competitive and adaptive systems. By learning through trial and error, agents can operate in the dynamic and unpredictable conditions characteristic of racing simulators.

Multi-Agent Reinforcement Learning (MARL) was integrated to enable parallel training of multiple agents, accounting for their interactions. MARL facilitates learning where agents dynamically adapt to each other's strategies. MARL's ability to handle competitive dynamics aligns with the goal of creating balanced yet adaptive agents, highlighting the importance of reward system design.

The Unity3D game engine and the ML-Agents library were chosen to create the training environment. Unity3D provides tools for creating 3D scenes and physical simulations, essential for realistic racing environments, while ML-Agents simplifies the integration of RL algorithms and enables real-time agent training using the environment.

The Soft Actor-Critic (SAC) algorithm was selected for its effectiveness in complex dynamic environments with continuous action spaces. Its entropy-maximizing framework ensures environment exploration during training, which is critical for discovering optimal strategies in unpredictable scenarios, as explained in the article (Haarnoja T., Zhou A., Abbeel P., Levine S., 2018).

To enhance agent awareness of the environment, ray perception sensors were added, enabling agents to detect obstacles and competitors in real time. This sensor-based approach allows agents to make context-dependent decisions and enables the agent to learn from more data. The agent's final observations include data on its linear velocity, distance to the correct checkpoint, detection of checkpoints and nearest obstacles (determined via ray perception sensors – 5 rays covering a 180° field in front of the agent), and in multi-agent mode – detection of the nearest opponents. The sensor functionality is shown in Picture 1.



Picture 1. Ray perception sensors in Unity3D

A reward system was also developed to improve agent trainability, upon which the agent learns:

- **Positive rewards**:
  - For passing checkpoints (+10 units with a progress bonus).
  - For moving along the optimal trajectory, built using Bezier curve principles (+0.05 units per step).
  - For maintaining a speed above 20 km/h (+0.05 units per step).
- **Penalties**:
  - For colliding with a wall (-50 units).
  - For exceeding the time limit (-500 units).
  - For passing the wrong checkpoint (-2 units).

A maximum reward (+5000 units) is awarded for completing the entire track, incentivizing the agent to achieve the final goal.

Training Success Evaluation

A key indicator of successful agent training is the stability of its behavior under various track conditions. After completing training based on the reinforcement learning algorithm, the model was tested in inference mode. During these tests, the agent received no external assistance, and its behavior was entirely determined by the parameters developed during training.

The model was tested under different simulation configurations:

- Against a manually controlled player.
- Against a car moving along a spline.

Observations showed that the agent successfully:

- Completes the track with minimal collisions with obstacles.
- Maintains movement within the road boundaries.
- Adapts speed before turns.
- Demonstrates a drive for maximum progress in minimal time.

The following metrics were used for quantitative evaluation:

- **Track Completion Time**: the graph is shown in Chart 1. Trained agents demonstrate faster track completion times, while the spline-following agent maintains a stable time.

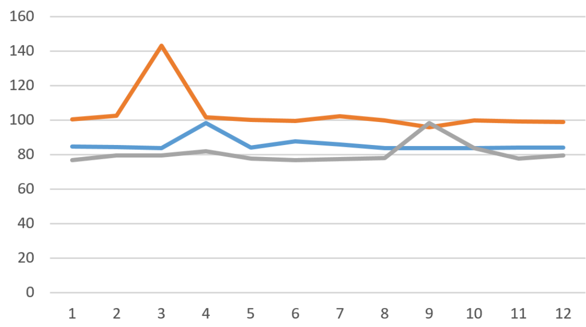


Chart 1. Track completion time comparison graph

– **Average Speed per Attempt**: the graph is shown in Chart 2. The trained agent maintains a significantly higher average speed per attempt, outperforming the spline-following agent on all attempts.

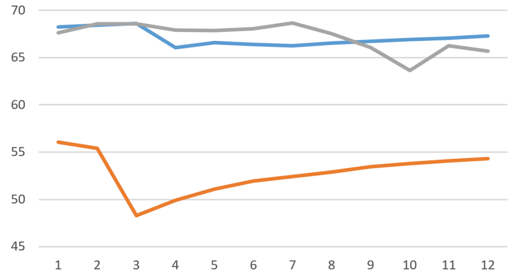


Chart 2. Average speed comparison graph

– **Penalties for Track Error:** the graph is shown in Chart 3. The trained agent demonstrates stable and low penalties compared to other approaches. Its penalties vary but do not reach significant peaks, indicating its ability to effectively adapt to the track and minimize errors.

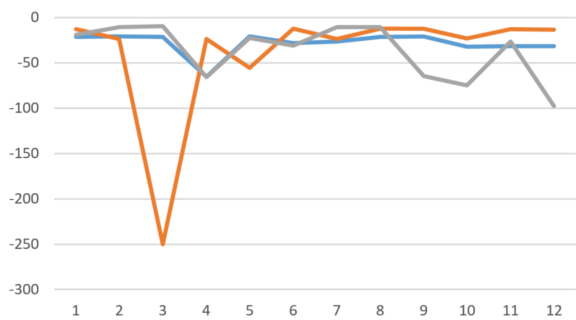


Chart 3. Penalty comparison graph

– **Total Reward per Episode**: the graph is shown in Chart 4. The graphs show the level of reward received by agents in different modes. Trained agents show high reward values, indicating their effective adaptation and optimization of actions during the simulation. However, the spline-following agent receives a practically fixed and higher reward because its behavior is strictly programmed. It also receives an additional reward for maintaining speed during prolonged track presence.

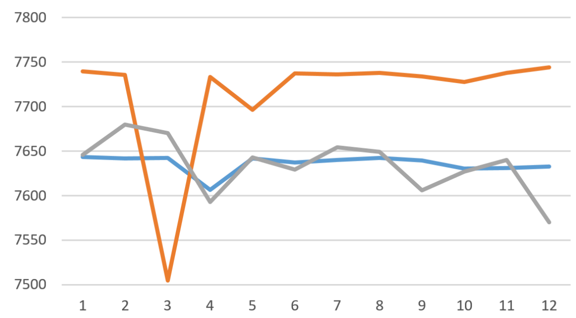


Chart 4. Reward comparison graph

As a result of this work, a functional test environment was developed in Unity 3D, supporting both single-agent and multi-agent learning. Three unique tracks with different geometries were implemented. A trajectory optimization system for the vehicle using splines was also implemented, adding a reward when the agent follows the ideal route.

For collision detection, Unity colliders are used. The vehicle's physical model is implemented using built-in Unity components such as Rigidbody for movement physics calculation and Wheel Colliders for wheel behavior simulation, providing basic control realism.

During this work, the set task of developing a simulator for competitive agent behavior in a racing environment was successfully solved. To implement the simulator, an analysis of existing artificial intelligence methods and their application features in dynamic conditions, such as racing competitions, was conducted, considering the shortcomings identified in existing systems.

As part of the development preparation, the simulator's architecture and algorithms ensuring agent interaction with the physical track model and with each other were implemented. The core of the work is the use of reinforcement learning algorithms, which enabled the creation of trained agents capable of adapting to track changes and the strategies of other participants.

The result of the work is a competitive agent behavior simulator, featuring various vehicle control modes, including reinforcement learning and manual control. The Unity3D platform was used for implementation, allowing the integration of the physical model alongside the ML-Agents library, which facilitated agent training.

The results of this work can provide a ready-made environment for training agents in competitive conditions against users or other agents in video games. This development can also be used for training autonomous vehicles or in robotics due to its wide range of capabilities and configurability. In the future, track generation could be added to train agents in random environments, improving their learning and adaptability on the track.

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