

Impact of Internet Media Reports on the COVID-19 Pandemic in the Population Aged 20-35

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Summary

The advent, course, and possible consequences of the COVID-19 pandemic are now the focus of global attention. From whichever side the geopolitical centers of influence might view it, the problem of the coronavirus concerns all world leaders and the representatives of all branches of science, especially physicians, economists, and politicians – virtually the entire population of the planet. The uniqueness of the COVID-19 phenomenon lies in the uncertainty of the problem itself, the peculiarities and specifics of the course of the biological processes in modern conditions, as well as the sharp confrontation of the main political players on the world stage. Based on an analysis of scientific research, the article describes the profile of the emotional concept of “anxiety” in Russian linguoculture. Through monitoring the headlines of Russian media reports in the “COVID-19” section of Google News and Mail News news aggregators dated August 4-6, 2021, the study establishes the quantitative and qualitative characteristics of the alarm-generating news products on coronavirus in the Russian segment of the Internet and interprets the specifics of media information about COVID-19. The level of mass media criticism in Russia is determined through a phone survey. It is concluded that coronavirus reports in online media conceptualize anxiety about the SARS virus and the COVID-19 disease as a complex cognitive structure. The media abuse the trick of “magic numbers” and emotionally expressive words in news

headlines, which are perceived by mass information consumers first and typically uncritically.

Keywords:

concept, anxiety, internet news, internet media, coronavirus, media criticism

1. Introduction

The current state of Russian society amid the COVID-19 pandemic is largely shaped by the participation of various media (from traditional to online ones) in ensuring public safety.

With the advent of coronavirus, the world media focused its main efforts on covering its symptoms, preventive measures, and recommendations on counteraction. The central place was taken by the statistics of occurrence, the geography of spread, possible forms, and ways to combat the disease [1, 2]. Analysis of the content of media reports on the increase in incidence and the spread of COVID-19 in the world to some extent evidences the purposeful and controlled nature of information presentation.

Analysis of research and publications [1, 2] regrettably shows a scarcity of scientific publications, books, scientific conference materials directly concerning the problem of the impact of media reports on the COVID-19 pandemic on the psychological state of a person. However, the lack of research does not challenge the fact of media reports

affecting people and heating their negative attitudes to stressful emotional states. Anxiety levels among individuals from different social groups and age categories vary. The degree of their susceptibility to the influence of media reports differs as well. In the absence of scientific data on the nature, forms, means, and ways in which media reports affect society, it is only possible to hypothesize in which ways and how effectively the media influence an individual's psychological state, whether people feel secure from the received messages or, on the contrary, becomes depressed, desperate, and panic-stricken.

Considering that the most powerful impact on the human psychophysiological state is produced by hidden, latent influence leading to short-term effects that evolve into various nervous disorders and anxiety [3], we set ourselves the objective to study the influence of internet media reports about the COVID-19 pandemic on the conceptualization of anxiety in the population to group, summarize, classify, and formalize these messages.

2. Literature Review

Anxiety as an object of scientific research is a multi-aspect and multidisciplinary phenomenon. A psychological view on the nature and essence of anxiety as an emotion and a state (depending on the specific theoretical approaches to the concept) is formulated by psychoanalytic theory (Z. Freud, K. Gorne, K. Yoon) and behaviorism, specifically in regard to the influence of anxiety on human behavior (G. Isaac, J. Watson). The role and significance of anxiety in the socialization process, particularly its negative effect on personal self-actualization, are examined by A. Maslow and C. Rogers [4].

The present study is based on the ideas of prominent American psychologist C. Izard who provided a substantial contribution to the differential theory of emotions. Izard refers to anxiety as a fundamental emotion the activation threshold of which can be associated with individual differences originating from biology, as well as with personal experiences and the overall socio-cultural context of the event [5]. The factors causing anxiety can be both natural (innate) and acquired (socio-culturally conditioned). However, anxiety also acts as an emotion of social resonance because it can not only be a warning signal causing an individual to change their thoughts or behavior, but also encourage people to strengthen their social bonds, including collective defense [5].

A significant contribution to the understanding of the concept of "anxiety" is provided by cognitive linguistics – a linguistic branch of cognitive science (cognitive psychology), which seeks answers to questions about how human consciousness is organized and how language represents the mental space. Similar to linguoculturology, cognitive linguistics primarily focuses on concepts as the

object of research. The definitions of "concept" vary greatly. In this work, we adhere to the conclusions of V. Maslova [6] regarding the essence and specifics of the structure of a concept, which presents a semantic formation with major linguocultural specificity and provides a certain characteristic of the representatives of the given ethnoculture. Maslova [6] argues that a concept is always "immersed" in the language and cannot be considered apart from the diverse contexts of its use. The conceptual analysis allows studying the profiles of any concepts, including emotional, such as anxiety. A range of comparative studies of the concept of "anxiety" in different cultures offers a fairly coherent system of scientific insights into the culturally conditioned specificity of speakers of these languages in experiencing anxiety and related emotions, feelings, and states.

E.A. Talanova's study can be considered one of the scientific attempts to characterize the structure of the emotional concept of "anxiety" in the Russian language [7]. The study presents a definition of anxiety as a complex cognitive structure encoded in language, which arises in response to a real or imagined threat to the life and calm, undisturbed existence of a person and their relatives, as well as to attempts at compromising an individual's authority in a social group; such experiences are accompanied by a complex of unpleasant subjective feelings [7]. Thought-provoking conclusions on the specifics of the concept of "anxiety" are proposed by T.K. Kasumov. His research indicates that in the Russian linguocultural image of the world: 1) anxiety has a future-oriented vector; 2) the components of anxiety include concerns, timidity, fear, and danger; 3) the qualitative and quantitative indicators of anxiety are "strong" and "big", "deep", "sudden", "prolonged", and "constant"; 4) anxiety is accompanied by suffering, unpleasant feelings, i.e. has a pronounced negative value; 5) deprivation of the feelings of anxiety is interpreted as psychological freedom [8].

One of the first attempts at conceptual analysis of media texts has been made by N.S. Vasilev. In his work, a concept is examined as an element of the structure of the text, a component of its idea that stresses the main idea [9]. In her dissertation study, E.V. Lavrova [10] convincingly confirms that the media actively, although with varying degrees of intention, utilize alarm-generating technologies. The researcher proposes an experimentally tested algorithm for counteracting the threatening tendency of increased levels of anxiety in media texts. In particular, the components of the algorithm include avoiding potentially alarming words or substituting them with positive elements, refraining from replicating and spreading the news with alarm-generating factors, and withdrawing from repeating the same potentially alarming message for a prolonged period [10]. Anxiety, particularly verbalized by media, cannot but affect the specifics of the formation of public opinion on topical, pressing, and controversial issues of the

“current agenda”, as well as the ways of its manifestation. It is all too often that the media use anxiety to manipulate mass consciousness without minding the consequences.

The present study aims to analyze the verbal communication tactics in the conceptualization of anxiety used by internet media when informing the audience about the coronavirus.

Meeting the established goal requires accomplishing the following objectives:

- to describe the profile of the emotional concept of “anxiety” in Russian linguoculture;
- to establish the quantitative and qualitative characteristics of alarm-generating news products on the coronavirus on the Russian segment of the Internet (as of August 4-6, 2021);
- to compare and interpret the specifics of media information about COVID-19 and the level of mass media criticism in Russia.

The hypothesis of the study suggests that the distribution of information about the rate and scale of the spread of the virus, the ways and means of combating it, and emphasis on the increasing dynamics of incidence and lethal cases have a substantial influence on the conceptualization of anxiety in news consumers.

3. Methods

3.1 Study design

To achieve the goal of the study, we identified an indicative set of theoretical and empirical research methods: theoretical methods (analysis, synthesis, comparison, generalization) used to study the scientific literature on the current state of the research problem;

empirical methods:

- the method of quantitative and qualitative monitoring of Russian-language headlines of information messages used to determine the intensity of alarm generation;
- the survey method used to determine the level of media criticism among news consumers;
- statistical methods used to process the results of the monitoring and the phone survey.

The first stage of the study involves quantitative and qualitative monitoring of Russian-language news headlines in the “COVID-19” section of news aggregators Google News and Mail News from August 4-6, 2021.

To identify the level of media criticism, at the second stage of the study, we conducted a survey of 142 people aged 20-35 who agreed to answer a series of questions over the phone. The 20-35 age cohort is selected as the one representing the most active users of the information provided on the Internet and social media.

The third stage of the study involved the analysis of the obtained data and results interpretation.

3.2 Research procedure and instruments

The conducted monitoring focuses specifically on the headlines as I.V. Bugaeva’s study [11] indicates that headlines are often used for alarm generation. This is due to the inherent property of the headline not to inform, but to interest, impress, and shock.

In the course of the monitoring, all headlines were sorted into three categories by the intensity of alarm generation with a certain value:

negative (increase, high anxiety, lack of control, fear), neutral (uncertainty about the development, anticipation, attempts to stop or control its development), positive (lowering anxiety, demonstration of interest and excitement as natural emotions and states in the process of transformation of anxiety, humor as a response to anxiety). Phone numbers for the phone survey were collected from free classified websites and social media accounts on “Odnoklassniki” and “Vkontakte”.

The respondents were presented with the following questions: Do you trust news on the Internet and social networks? What news source do you prefer? Do you get news online from specialized websites and forums? Are you able to distinguish reliable information from misinformation? Is misinformation present on social media? Are you interested in information products that aim to counter manipulation and disinformation? Who do you think is responsible for combating misinformation?

Response time ranges from 5 to 10 minutes per respondent.

3.3 Statistical analysis

The study deploys numerical calculation methods to process the results of the monitoring and the phone survey using the Microsoft Excel software product.

4. Results

In the examined period, 206 news reports were published on the topic of coronavirus (Table 1).

Table 1: Results of monitoring of the headlines of Russian media reports in the “COVID-19” section

No.	Alarm generation intensity value	Number of reports
1	negative	108
2	neutral	56
3	positive	41

The first category includes 108 headlines. It is quantitatively dominated by the headlines that “savor” the incidence and lethal cases of coronavirus in Russia and the world: “The family of an anti-vaxxer from England who died of COVID-19 calls not to repeat his mistake” (Gazeta.ru), “Seven coronavirus patients died in the Tula Region on August 6” (Molodoi kommunar), “Georgia

warned of a threat of health system collapse due to COVID-19" (Lenta.ru), "Number of COVID-19 cases in the world exceeds 200 mln" (Interfax), "Russia again reports over 23 thousand people infected with coronavirus" (Kommersant), "For exactly one month in a row, over 700 people are dying of COVID daily in Russia" (RBC), etc.

The second category comprises 56 headlines, the vast majority of which include explanatory information, information aiming at relieving excessive emotional stress and anxiety reassuring news consumers: "Head of WHO warns of 'a period of real danger' because of COVID-19" (RT in Russian), "Almost 12 thousand Krasnodar Krai residents underwent advanced medical examinations after COVID-19" (Kubanskiye Novosti), "Murashko lists regions with the most challenging situation due to COVID-19" (Rossiiskaia Gazeta), "Scientists declare fall in vaccine effectiveness and suggest action plan" (RBC) and the like. The third category includes 41 headlines showing a decrease in the overall anxious state, picture clear and positive perspectives, contain humor, and mention curious occasions: "MIA makes a historic decision for economic recovery after COVID-19" (Lenta.ru), "BCG vaccine proven effective against coronavirus", "The vaccine has the highest efficiency": the head of San Marino Health Ministry about 'Sputnik V' and disapproval of the vaccine by the European Union" (RT in Russian), "Getting vaccinated like going on a holiday" (Kommersant), "Expert: collective immunity to COVID-19 in Moscow may form by March" (TASS), "British study: children go through COVID-19 easily and recover quickly" (BBC-News Russian Service), and others.

It should be noted that headlines with the negative value of anxiety are not too prevalent – 108 compared to the total of 97 neutral and positive ones. However, all of them undoubtedly utilize the communicative tactics of generating anxiety, in particular, using the manipulative technique of "magic numbers" and abusing the words "victim", "virus", "dead", and "contamination". Therefore, news messages about coronavirus are not very successful at forming in their audience the type of anxiety that fosters community cohesion for responsible collective resistance against COVID-19. Most of them are designed to astonish and shock.

The survey conducted after obtaining the monitoring results shows that most respondents trust news from the Internet, including those on social media (68%). Meanwhile, 26% of the respondents mostly aged 32-35 years old give their preference to television news and political talk shows. According to the survey, almost half of the respondents (48%) constantly use the opportunity to get online news from specialized sites and forums.

The survey results also demonstrate that a little over half of the respondents (52%) believe that they can distinguish quality information from misinformation on their own at least in most cases. In contrast, a quarter of the survey

participants (26.5%) feel that they either cannot tell the difference between the two at all or can only do so in a minority of cases.

An interesting tendency is quite a low interest of the respondents in information products aiming to counter manipulation and misinformation. Only 10% of the study participants report having watched some television shows focused on fighting misinformation in the past month. It is important to note here that the lack of criticism to sources and content of information can be automatically extrapolated to the rate and scale of the spread of coronavirus, the ways and means of battling it, and protection against it. In this case, the range of feeling and emotional perception of information about the pandemic can be extremely wide: from stubborn disbelief in any information about the infection to negligence and carelessness to panic moods and states. These assumptions are not unfounded, especially given the massive trust in social media news demonstrated by the study (68%). It is worth adding that although the respondents (77%) admit to misinformation on social media, they still prefer them to other media outlets.

A not-so-high percentage of the respondents (28%) believe themselves to be responsible for combating disinformation. 39% of the respondents argue that misinformation, in social networks in particular, has to be addressed by the state.

Thus, the study results indicate that internet media messages about coronavirus conceptualize anxiety concerning the SARS virus and the COVID-19 disease as a complex cognitive structure. The media tend to abuse the technique of "magic numbers" and emotionally expressive words in news headlines, which are typically perceived by information consumers uncritically without checking for accuracy.

5. Discussion

Research shows [12] that since the advent of coronavirus, the public has witnessed the spread of a large number of rumors, myths, and misinformation about the causes, course, and consequences of the disease.

Scientists [13] note that misinformation, myths, and unverified information continue to spread around the world. Despite researchers' attempts to reveal the positive aspects of the use of social media in the formation of a positive perception of stress factors in the pandemic [14], we believe that rising anxiety levels can have detrimental effects not only on the psychological well-being of the population, but also on public safety, public health, and effective social communication in a crisis. In this context, it is important to distinguish between the various forms of inaccurate information, misinformation, and attempts to manipulate them based on analysis and summarization of media content.

Many of them are part of intentional and concerted actions of state authorities or entities sponsored by foreign states [15].

Given the lack of reliable coronavirus information, it is critical to coordinate the practical actions of state bodies, political parties, and public organizations within each state. Research data [16] prove that extremely dangerous and harmful misinformation about COVID-19 is momentarily spread by small media within and outside the UN where Internet companies have less incentive to take adequate countermeasures.

Aside from deliberate and often state-supported campaigns, conspiracy theories and inaccurate or misleading information about the coronavirus infection continue to spread on social media. An analysis covering materials in five European languages and the Arabic language demonstrates that “millions of Facebook users are still at risk of receiving dangerous, unverified information about the coronavirus in large volumes”. Researchers analyzed the selected content and found that it was published on this social network more than 1.7 million times and received approximately 117 views [17].

Researchers [18] analyzed materials made public in nine European languages, in particular Czech, German, Polish, and Russian. It can be stated that false and misleading information continues to be replicated in all languages, even if it has already been identified by local fact-checkers (experts who verify the reliability of facts). For instance, one in three respondents in six countries (Argentina, Germany, South Korea, Spain, the United Kingdom, and the United States) claims to have come across “huge amounts” of false information about COVID-19 on social media and messaging apps and a third of British citizens believe that vodka can be used to disinfect hands [19].

In this regard, special attention should be paid to overtly manipulative methods of influencing mass consciousness and public opinion. There is also a need for high-quality and, most importantly, safe informing on COVID-19, not only avoiding sensationalist headlines, but also carefully selecting the lexical and stylistic means and illustrative material, showing successful examples of confronting the epidemic, countering the involuntary and conscious stigmatization of people and entire regions affected by the virus, and so forth. In addition, psychological support services should be developed for special situations. For example, in Malaysia, people could call special support centers when their anxiety was rising. The results of the study show that 55% of the respondents felt comfortable receiving counseling support [20].

Thus, under critical conditions of social development, particularly those associated with a risk to people’s lives and health, professional incompetence, including that of journalists, is highly dangerous. Professionalism in the performance of journalistic duties, the quality of

information about the coronavirus, the rate and scale of the epidemic, and the ways and means of combating it affect the degree of clarity and thoroughness of information consumers’ image of the world and, accordingly, the reduction of mass anxiety, panic, or criminal indifference to one’s own health and the health of loved ones. At the same time, the audience’s higher media criticism when receiving information messages ensures conscious and responsible behavior, which guarantees personal and collective safety in a pandemic.

6. Conclusion

The concept of anxiety in language consciousness is a complex cognitive structure having a considerable number of components of the feeling and emotional nature: concerns, anxiety, fear. Anxiety is recorded in speech as a psychophysical state, a symptomatic human reaction to danger, uncertainty, and the unknown and, therefore, has a negative value. This is extremely vividly reflected in the lexemes that characterize anxiety by qualitative and quantitative characteristics, marking its psychosomatic nature. Conceptual analysis of the emoteme “anxiety” in the linguistic and cultural image of the world postulates its connection with psychological unfreedom.

The monitoring results show that internet media reports on coronavirus conceptualize anxiety regarding the SARS virus and the COVID-19 disease as a complex cognitive structure. The media abuse the trick of “magic numbers” and emotionally expressive words in news headlines, which are typically perceived by mass information consumers uncritically, without checking for accuracy.

Thus, the study confirms the proposed hypothesis that the constant multiplication of information about the rate and scope of the spread of the virus, the ways and means of combating it, and the emphasis on the increasing dynamics of incidence and lethal cases have a significant impact on the conceptualization of anxiety among news consumers. Nevertheless, the study has some limitations in terms of both the timing of the monitoring of the headlines of Russian COVID-19 information messages and the size and age composition of the sample of respondents, therefore, the study results cannot be extrapolated in full.

Prospects for further research can lie in a more detailed differentiation of alarm-generating messages in online media in terms of geography and thematic distribution of reports about the COVID-19 pandemic.

References

- [1] Qin, L., Sun, Q., Wang, Y., Wu, K.-F., Chen, M., Shia, B.-Ch., & Wu, S.-Y.: *Prediction of number of cases of 2019 novel coronavirus (COVID-19) using social media search index*. International Journal of Environmental Research and Public Health, vol. 17(7), pp. 2365 (2020). <https://doi.org/10.3390/ijerph17072365>

- [2] Rufai, S.R., Bunce, C.: *World leaders' usage of Twitter in response to the COVID-19 pandemic: A content analysis*. Journal of Public Health, vol. 42(3), pp. 510–516 (2020). <https://doi.org/10.1093/pubmed/fdaa049>
- [3] Levitov, N.D.: Psikhicheskoe sostoianie bespokoistva, trevogi [Mental state of worry and anxiety]. In Astapov, V. M. (Ed.), *Trevoga i trevozhnost: Khrestomatiia* (pp. 78-85). Moscow, Russia: Per Se (2008).
- [4] Aizenk, Kh.: Psikhologicheskie teorii trevozhnosti [Psychological theories of anxiety]. In Astapov, B.M. (Ed.), *Trevoga i trevozhnost: Khrestomatiia* (pp. 217-239). Moscow, Russia: Per Se (2008).
- [5] Izard, K.E.: *Psikhologiya emotsii* [Psychology of emotions]. Saint Petersburg, Russia: Piter (2003).
- [6] Maslova, V.A. *Lingvokulturologiia: Uchebnoye posobiye dlya studentov vysshikh uchebnykh zavedeniy* [Linguoculturology: Textbook for students of higher education institutions]. Moscow, Russia: "Akademiia" publishing center (2001).
- [7] Talanova, E.A.: *Kontsept "trevoga" v praktike prepodavaniia RKI* [The concept of "anxiety" in the practice of teaching Russian as a foreign language]. Sistema tsennosti sovremennogo obshchestva, vol. 35, pp. 76-80 (2014).
- [8] Kasumov, T.K.: *Trevoga kak takovaia i kak kontsept* [Anxiety as it is and as a concept]. Filosofiya i kultura, vol. 10, pp. 36-48 (2017). <https://doi.org/10.7256/2454-0757.2017.10.22194>
- [9] Vasilev, N.S.: *Novaia kontseptosfera zhurnalistskikh tekstov i problema interpretatsii soobshchenii* [The new conceptsphere of journalistic texts and the problem of message interpretation]. Uchenye Zapiski Kazanskogo Universiteta. Seriya Gumanitarnye Nauki, vol. 157(4), pp. 46-53 (2015).
- [10] Lavrova, E.V.: *Predstavlenie ob opasnosti i ego transformatsiia pod vlianiem televizionnoi kommunikatsii* [The perception of danger and its transformation under the influence of telecommunication]. Ph.D. thesis in psychology. Lomonosov Moscow State University, Moscow, Russia (2017).
- [11] Bugaeva, I.V.: *Zagolovki v internet-SMI: Priemy privlecheniia vnimaniia tselevoi auditorii* [Headlines in internet media: Methods of attracting the attention of the target audience]. In Annushkin, V.I. (Ed.), *Proceedings of the 22nd international scientific conference «Media rhetoric and modern culture of communication: Science - Practice - Education»* (pp. 39-42). Moscow, Russia: Pushkin State Russian Language Institute (2019).
- [12] Casero-Ripollés, A.: *Impact of Covid-19 on the media system. Communicative and democratic consequences of news consumption during the outbreak*. El profesional de la información, vol. 29(2), pp. e290223 (2020). <https://doi.org/10.3145/epi.2020.mar.23>
- [13] Zhou, W., Wang, A., Xia, F., Xiao, Y., Tang, S.: *Effects of media reporting on mitigating spread of COVID-19 in the early phase of the outbreak*. Mathematical Biosciences and Engineering, vol. 17(3), pp. 2693-2707 (2020). <https://doi.org/10.3934/mbe.2020147>
- [14] Marzouki, Y., Aldossari, F.S., Veltri, G.A.: *Understanding the buffering effect of social media use on anxiety during the COVID-19 pandemic lockdown*. Humanities and social sciences communications, vol. 8(1), pp. 47 (2021). <https://doi.org/10.1057/s41599-021-00724-x>
- [15] Bennett, W.L., Livingston, S.: *The disinformation order: Disruptive communication and the decline of democratic institutions*. European journal of communication, vol. 33(2), pp. 122-139 (2018). <https://doi.org/10.1177/0267323118760317>
- [16] Cinelli, M., Quattrocioni, W., Galeazzi, A., Valensise, C.M., Brugnoli, E., Schmidt, A.L., Zola, P., Zollo, F., Scala, A.: *The COVID-19 social media infodemic*. Scientific Reports, vol. 10, pp. 16598 (2020). <https://doi.org/10.1038/s41598-020-73510-5>
- [17] Tsao, S.-F., Chen, H., Tisseverasinghe, T., Yang, Y., Li, L., Butt, Z.A.: *What social media told us in the time of COVID-19: A scoping review*. Lancet Digital Health, vol. 3, pp. 175-194 (2021). [https://doi.org/10.1016/s2589-7500\(20\)30315-0](https://doi.org/10.1016/s2589-7500(20)30315-0)
- [18] Schillinger, D., Chittamuru, D., Ramirez, A.S.: *From "infodemics" to health promotion: A novel framework for the role of social media in public health*. American Journal of Public Health, vol. 110, pp. 1393–1396 (2020).
- [19] Medford, R.J., Saleh, S.N., Sumarsono, A., Perl, T.M., Lehmann, C.U.: *An "infodemic": Leveraging high-volume Twitter data to understand early public sentiment for the coronavirus disease 2019 outbreak*. Open Forum Infectious Diseases, vol. 7(7), pp. ofaa258 (2020). <https://doi.org/10.1093/ofid/ofaa258>
- [20] Ahmad, S., Hussain, Z., Abd Hamid, H.S., Khairani, A.Z.: *Roles of social media and counselling support in reducing anxiety among Malaysian during Covid-19 pandemic*. International Journal of Disaster Risk Reduction, vol. 63, pp. 102456 (2021). <https://doi.org/10.1016/j.ijdrr.2021.102456>