

The Development of Russian Youth Digital Citizenship: How to Analyze and Tackle the Internet Communication Risks

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Abstract. The paper is focused on the communication safety of children and young people in the social media space as a condition of Youth digital citizenship development. The authors presents the results of an intellectual search for the analysis of the most common risks of Internet communication faced by Russian children, or teachers and counselors working with children. The research design includes discourse-analysis of the social media posts reflecting the most relevant Internet risks, automated social media analysis with the special tool – software for new media monitoring (IQBuzz) and eye-tracking for destructive online content neurovisual reaction measuring (kind of neurovisual modeling of the Internet-content perception). The article covers the algorithm of tackling the Internet risks: 1) defining of the Internet risks markers; 2) identifying of the Internet risks triggers; 3) developing of recommendations for teachers and counselors to minimize Internet risks for children and young people. The prospect of the research could be the social graph analysis oriented to the identification of the destructive online group connections' density, destructive opinion leaders' techniques and features of the asocial users' activities. The final product is the measures to maximize the opportunities that open up in the digital environment for Youth: social project activities, civic activism, and digital democracy.

Keywords: First Keyword, Digital Citizenship, Youth, Teenagers, Social Media, Social Media Monitoring, Internet Communication Risks, Digital Markers of Internet Risks, Internet Risks Triggers, Neurovisual Techniques to Counter Destructive Network Communities.

Introduction

Russia, like most countries with national Internet audiences exceeding two thirds of the total population, links further social, economic and political development with digitalization. The country has grown a new generation of "digital citizens" who have reached adulthood, the socialization of which was carried out including through Internet communication. At the same time, Internet risks faced by Russian children, adolescents and youth are a significant obstacle to the development of a culture of digital

citizenship. In Russia, there is still no educational program aimed at creating a culture of "digital citizenship", approved at the state level.

According to the founder of the concept of digital citizenship, K. Mossberger, this definition is understood as the ability of individuals to participate in society, to fulfill their civic responsibilities in the course of network communication [8]. In the framework of the concept of digital citizenship, a number of authors focused on methodological issues of preparing and adapting citizens to life in a digital environment. For example, M. Ribble defines digital citizenship as the norm for appropriate, responsible behavior regarding the use of technology [10]. He offers an authoring methodology for teaching digital citizenship in order to help students become productive and responsible users of digital technologies. In turn, L. Jones and C. Mitchell emphasize educational technologies for achieving the quality state of digital citizenship of youth [3]. K. Mattson focuses on the beneficial aspects of digital youth citizenship programs [6]. Researchers such as W. Bennett, C Wells and A. Rank explore the possibilities of civic education in online and offline environments [1]. D. Ohler proposes to redefine the roles of citizens in the modern globally connected infosphere and proposes the adoption of a comprehensive "roadmap" for moving towards citizenship in the 21st century based on demanded digital competencies [9].

The problem of Internet communication risks impact on the children and young people socialization begins to draw the researcher's attention. It should be recognized that foreign researchers slightly earlier than in Russia began to study it. The impact of online risks on children, protection from them and prevention is considered by John Brown [3] The research of European scientists in the field of Internet safety of young media users within the framework of the pan-European project "EU Kids Online" and the national project "British Children on the Internet" (UK Children Go Online) under Professor S. Livingstone [5]. For example, the study found that users with higher levels of digital competence face more online risks than their less convergent peers Studies of cyberbullying by R.M. Kowalski [4] are quite influential, which provide a methodology for measuring this Internet risk and measures to prevent it. Important for this work are T. Milosevic 's research [7] on studying the actions of social networks, including Facebook, Twitter, Snapchat and Instagram, to overcome the problem of cyber intimidation by young users. Pamela Whitby 's work [11] informs parents what their child will face online. This practical guide shows that children can be protected from the dangers of the Internet, from the risks of chat and games with family rules.

1 Research methodology

The methodology of social-media flows analysis presenting digital markers of Internet risks data for schoolchildren involved implementation of the following research procedures algorithm:

1. Justification of groups' selection in social media as objects of qualitative analysis of message content. The logic of the applied target selection is in the formation of a selective set of online communities containing dialogues of participants about Internet risks. Research cases were made by such risky situations as cyberbullying, school

shooting, and suicide pushing. For each of these risk types, 20 online communities have been selected, and 1800 documents have been analyzed. The result of understanding the content perception of relevant social-media groups was a dictionary of digital markers - requests for automated accumulation of relevant information flows.

2. Discourse analysis of unloaded social-media messages of the primary amount, used to refine search queries and compile final dictionaries of search queries. To identify the "purity" (relevance) of messages accumulated in the preliminary array, a systematic sample was used (step - 10), a total of 1500 messages were analyzed (500 in each of the three arrays).

3. Automated upload of Internet content using created marker dictionaries and online service for monitoring social media IQBuzz, a total of 953,000 messages have been uploaded (together for all types of streams about Internet risks), depth of accumulation 2016 - 2018.

4. Quantitative and qualitative analysis of downloaded Internet content was carried out using automatically generated statistical reports on technological, content and dynamic characteristics of information flows. The interpretation was performed according to the criteria specified by the program:

- Weight of information flows;
- Dynamics of information flows;
- Tag clouds - semantic core of information flows;
- Publication activity and user audience of opinion leaders;
- Distribution of information streams by gender and age of the user audience.

2 Research results

Cyberbullying/Harassment on the Internet. Cyberbullying is understood by the authors as a systematic and targeted negative online impact on the social and media user for the purpose of causing psychological trauma and/or introducing depression.

Markers - the basis for selecting accounts as units of analysis for the research case "cyberbullying":

- a small number of friends on social media;
- discriminatory Internet content on friends pages;
- the prevalence of negative comments on the posted information;
- when discussing events/actions - transition to personality assessment;
- labelling and the use of insults;
- personality depreciation/reduction to any disadvantage.

In the course of information flows unloading implementation where digital markers of cyberbullying were reflected, the following search queries were used: (sample of the digital markers, translated to the English): "bullying&in&school", "cyberbullying", "victim&bullying", "harm&in&school" "teacher& bullying", "Internet&bullying"¹.

¹ Original markers in Russian: "буллинг&в&школе", "школьная&травля" "школьный&буллинг", "кибербуллинг", "жертва&буллинга", "жертва&буллинг" "унижение&в&школе" "коллективная&травля" учитель& буллинг", "учитель&травля", "групповая&травля" "интернет&травля" "оскорбления*{1}школ%", "оскорбле-

Total number of social-media documents accumulated according to these digital markers - 280,000, source of unloading - blogochosting "Vkontakte," depth of unloading - period from 1.01.2017 to 10 October 2018.

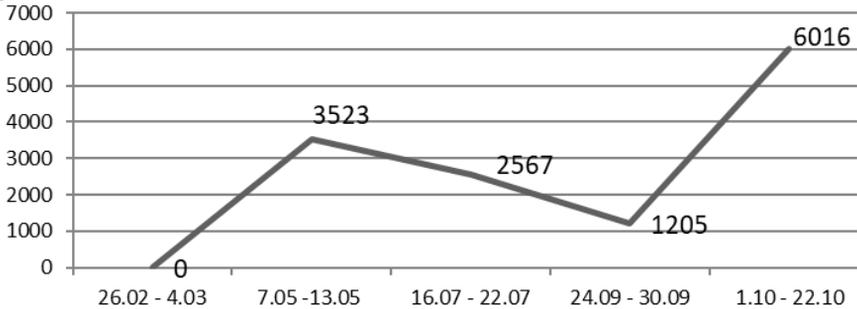


Fig. 1. Dynamics of information flows on cyberbullying in social media in the period from 26 Febr. 2018 to 22 Oct. 2018

The dynamic characteristics of the resulting arrays of relevant documents are shown in Figure 1. According to these data, a remarkable intensification of the analyzed flow occurred at the end of February - the beginning of March 2018, and the maximum extremum is at the end of September 2018. These peaks have substantial intersections with offline events concerning cyberbullying. At the beginning of this spring there was an active discussion in traditional and new media of the intensive growth of network groups with a destructive focus: pushing to harm health and life, immoral and criminal social actions. It was during this period that the number of reports attempting to make sense of the factors, causes, triggers of cyberbullying, and ways to prevent and counter this type of Internet risk increased dramatically. At the end of September 2018, the surge in reports of cyberbullying could be explained by the indirect impact of the Kerch tragedy, which significantly affected social media content, including information flows about cyberbullying.

The gender ratio of the identified authors of the uploaded social and media documents indicates the de facto parity representation of masculine and feminine groups among the user audience of the cyberbullying streams (see Figure 2).

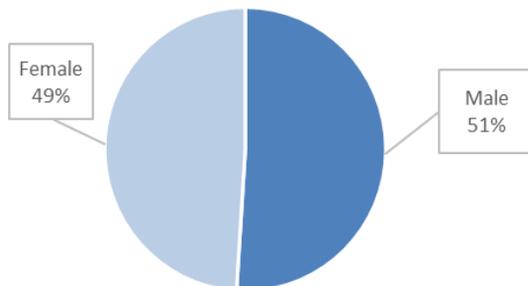


Fig. 2. Gender distribution of cyberbullying reports authors

ния*{1}одноклассн%", (травля|травить)&-(соба%|хим%|орган%), "дразнят&v&школе", "обзывают &v&школе"[In Rus.].

This shows the de facto equal chances of young people and girls, men and women becoming victims of cyberbullying or meeting the problem indirectly through family members. The age ratio of documents authors, which reflect the problems of cyberbullying, generally repeats the contours of the most active audience of social media: users between the ages of 26 and 35 most actively publish documents on cyberbullying, also rather widely represented in this audience people aged 36-45 years (see Figure 3). These two age groups obviously represent a commonality of parents concerned about the risks of cyberbullying to which their children are exposed. A rather small proportion of users aged 15 and under in the analyzed audience can be explained by the fact that registration of accounts in social media is possible only from the age of 14. Young people as young as 16- 25 are also quite heavily represented in the structure of the user audience of streams about cyberbullying, which indicates harassment in the network as a problem typical for both teenagers and youth age group.

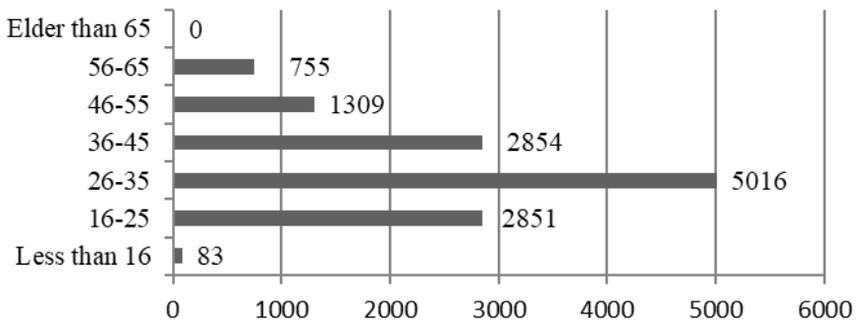


Fig. 3. Age characteristics of the stream audience about cyberbullying, in absolute value

On the one hand, the digital environment becomes a space of harassment, moral damage and mental damage, while the social and media space provides opportunities to express the reaction of victims of cyberbullying, as well as to find like-minded and sympathizers.

There is a complex correlation between the emergence of depression in adolescents and young people, threatening suicide attempts and involvement in communication through social media. This connection is expressed in the fact that depressive states did not end in suicidal actions most often in those members of the younger generation who had the opportunity to be constantly online, and, on the contrary, removal from communication in the network as a whole more often caused installation for suicide [1], [2], [9].

Pushing for suicidal behavior.

Pushing for suicidal behavior in a network environment as a research case was interpreted as a targeted psychological influence on the user in order to form a behavioral setting on committing suicide.

Markers - the basis for selecting accounts as units of analysis for the research case "pushing for suicidal behavior":

- intense and prolonged harassment/exclusion of the account author;

- involvement of the account author in online communities presenting suicide as a form of game/quest;
- involvement of the account author in online communities presenting suicide as freedom/adulthood/choice;
- posting suicidal content on the account.

The unloading of the social and media stream presenting the digital markers of suicidal behavior was carried out using the following search queries: (sample of the digital markers, translated to the English: «Death| (Sinny Kit)| #makesuicide | @kill yourself || funeral|| {heaven & hell & inferno}»²).

By means of the listed digital markers 102 802 messages of their blog hosting site VKontakte from March 1, 2016 till November 1, 2018 were accumulated.

The tags were divided into several semantic groups. The first group includes words such as "Post," Original, "Text." It is the most numerically represented group of tags, indicating the perception of suicide reports as unique documents popular in the environment of social media posts and meaning "Farewell Post" (suicide note) and "The Original Way to Leave Life." The second group of tags contains the words: "New," Life, "Live," Want, "Good," House. " This pool of word usage is semantically close to such logic: "Suicide is the beginning of a new, good life, it will give a new, good house." The third group is tags that combine words that indicate a clear order of action (instruction group): "Place," Need, "Make." Thus, the whole sequence of tags fits into the scheme: "The original way to leave life, which will provide a new, good life and find a new and good house."

Analysis of the names of influential blogs and online groups reflecting conversations about suicide shows that the most numerically voluminous audience has a block of priest Vladislav providing spiritual assistance in difficult life situations. The remaining groups have from hundred to four hundred among their user audience. Group names are entirely based on the names of their creators and do not carry a serious semantic load. These groups are not so-called "death groups" that stimulate and encourage adolescents to commit suicide. Real "death groups" - closed communities, accounting and unloading of messages of which online service for monitoring social media does not carry out.

The socio-demographic analysis of the suicide reports authors indicates the prevalence of girls among them, users aged 15-17 and most often residents of large cities.

The dynamics of the social and media flow about suicide, presented in Figure 4, shows that this flow is unstable, has many peaks of different intensity and falls to virtually zero. Most of the relevant messages are recorded in the blogochosting "VKontakte." The peak in March 2016 is due to a case that took control of the Civic Commission on Human Rights: "On March 23, 2016, the Civil Commission on Hu-

² «Смерть| (синий кит)| #уходизмира | самоубийство| (покидая мир)| death | смерть| выход| #откобэйниться| выпилиться| умереть| слдохнуть| @килл | 200| двухсотка| @килла| #kill | похороны| отпевать| отпевка| самоубийства| покинуть| прыжок| @лобби| (улететь в лобби) | откакрыжиться| Подохнуть| {рай & ад, 3}| #чистилице| прощание | @пз (предсмертная записка) |Ня пока (ня.пока либо #няпока); Самовыпил (самовыпилиться); f57; вскрыться #депра #жизнелюб #суи #су #СУ #с/у #сушник #фен» [In Rus.].

man Rights was approached by Andrei Vershinov from the city of Arzamas, who reported that on March 10, 2016 his aunt Elena Vershinova (both names changed) committed suicide allegedly after having taken an antidepressant on the appointment of a psychiatrist" (<http://www.cchr.ru/news/464.htm>). Although the woman was not in suicidal groups, a surge in social media activity triggered this due to the active circulation of reports of this suicide online.

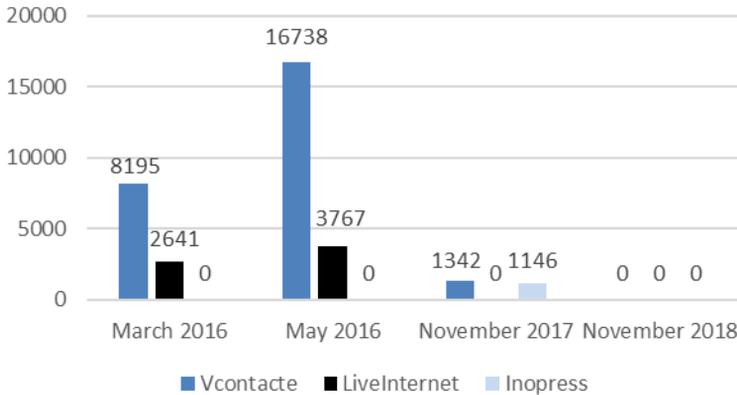


Fig. 4. Dynamics of social and media reports of suicides between March 2016 and November 2018, in thousands

Taking into consideration the fact that messages from closed "death groups" were not included in the unloading, and the statistics presented in figure 6 (measured in thousands of documents) reflect only an open online discourse about suicide, it is obvious that there is a very wide interest in the topic of stimulating suicidal behavior in social media.

Distribution of online content of extremist and terrorist content, involvement in extremist, terrorist activities (school shooting)

This type of Internet risk is interpreted by the team of authors from the point of view of mobilizing users through online propaganda of radical, extremist attitudes: readiness to participate in actions of civil disobedience, terrorist actions. An integral part of the risk type is school shooting, which can be reduced to motivation in the network space for the organization of terrorist acts in educational institutions. School shooting served as a specific case for exploring the process of distributing online content of extremist and terrorist content.

Markers - the basis for selecting accounts as units of analysis for the research case "school shooting."

- posting content on their accounts that discriminates against people/groups/nations based on their ethnicity and religion;
- subscriptions to online communities that distribute extremist content;
- intensive support of this content through "likes," exchanges, retweets, etc.;
- consciousness of "besieged in the fortress";
- transfer of one person qualities to a group/people/nation;

- having friends who share extremist, nationalist views;
- the instructive nature of the content in the adolescent 's account;
- use of symbols in the account aimed at escalating history;
- development of symbols and application of protest metaphors.

Accumulation of socio-media flow reflecting school shooting markers was performed using the following digital markers:

Filter 1 (columbine) (Vladislav & Roslyakov) & (true & crime & community) (natural & selection) (natural & selection).

Filter 2 "blow up the school" "blew up the school" "blow up the school with everyone inside" "want to kill my classmates" "make something like columbine" "repeat columbine" "repeat columbine in my school" "make them columbine" "finish my classmates" "eric harris" "eric haris" "erik harris" "Eric harris and dylan klebold" "harris and klebold" "harris klebold" ""eric harris cool" "eric harris did well" "school-shooting in Kerch] columbine & shooters".

With the help of the listed digital markers, 570,000 messages were unloaded in the Russian-language and English-language segments of social media: "Facebook," Vkontakte, "YouTube," Odnoklassniki, "Twitter," Instagram "for the period from January 8, 2018 to October 22, 2018.

Figure 5 shows a surge in the intensity of flows about school shooting in social media in connection with the tragic accident in Kerch in September 2018. An alarming signal is the fact that the main contexts analysis of this stream messages indicates attempts to glorify the teenager who carried out this terrorist act and romanticize his motives.

Gender analysis of the audience of the studied stream showed that the involvement in the information flows of "Colombian communities" is more inherent to the male audience than to the female audience - respectively 64% and 36% - see Figure 6.

The dominance of the maskulin gender group among the authors of reports of school shooting shows that, compared to girls, young man are more predisposed to carry out the devotions under consideration, and are more ready to respond to calls for asocial actions, which is due to the specific psycho-emotional and socio-psychological development of this part of adolescents and young people.

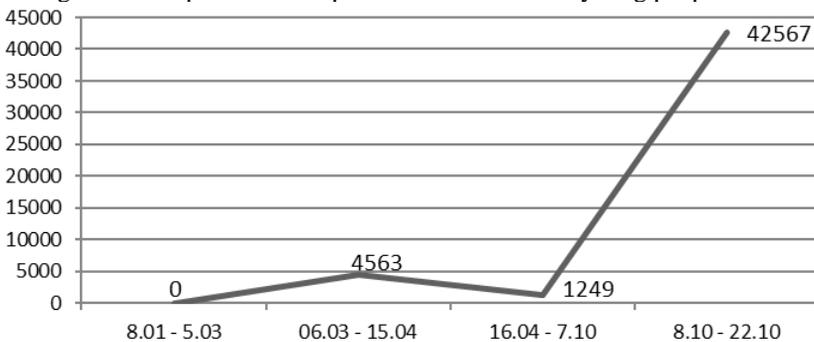


Fig. 5. Dynamics of social and media flow reflecting digital traces of school shooting between January 2018 and October 2018 in blogochosts "Facebook," Vkontakte, "YouTube," " Odnoklassniki, "Twitter," Instagram"

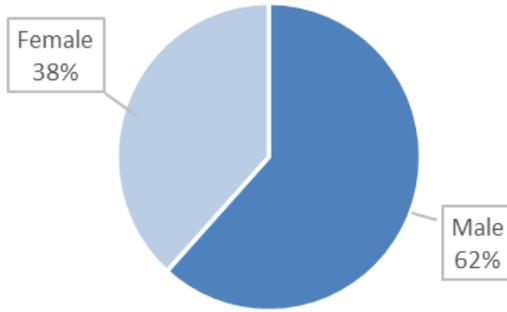


Fig. 6. Gender ratio of audience streams on school shooting

According to the data of Figure 7, most interested in the subject of school shooting, are representatives of the younger generation and number more than 8 thousand authors under 35 years of age. It should be noted that the number of authors under the age of 25 is only half of the number of speakers (about 4,000 authors). The number of youngest authors under the age of 16 is only 451. In general, this corresponds to the portrait of the most active user of social media, as well as the age characteristics of parents of those teenagers who are in the most sensational for perception of ideas of school shooting.

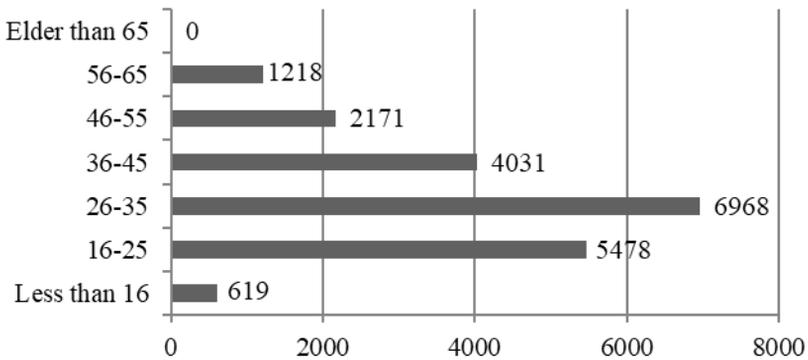


Fig. 7. Age ratio of school shooting reporting authors

Analyzing the publication activity of the most influential network groups associated with school shooting, note that the largest user audience has a community "Natural selection," it features 20,027 participants. It is a group that designs and distributes ideas of necessity of natural selection, rejection of values of humanity and mercy, realization of the principle "Survives the strongest."

"The World of Maniacs and Serial Killers" group generally semantically and discursively repeats the contours of ideas circulated in the "Natural selection" community, spreading the values of mass murder in order to uphold their principles and achieve their goals.

Participants of this network group deny, subvert the importance of morals and morality in human society. This group has a very wide audience (281,718). In another rather representative online community - "World of Crimes" - there is a discussion of various ways of killing people, options for committing crimes. Despite the absence of explicit calls for school shooting or other crimes in this group, the very fact of active communication on these topics can serve as a trigger for the formation of the user's position on the organization of socially dangerous actions.

Analysis of the tag cloud typical for the school shooting flow revealed several semantic word usage groups associated with a particular discussion context. The first group of words: "crimea 'college' place |" indicates the intense circulation in social media of reports about the Kerchen episode of school shooting, which literally blew up the network environment in late September - early October 2018. The second group of tags: "murder 'life' child |" concerns an indication of the social essence of school shooting. And the third group of the most common in the analyzed stream of word usage: "weapons 'explosion' murder |" concerns the technological aspect of the organization of school shooting.

Conclusions

The semantics of flows about cyberbullying indicate that teenagers with specific appearance or special behavior are the main target of online harassment. Different, specificity serves as a basic reason for cyberbullying. In this regard, only helping a teenager to adopt himself and his characteristics, to master communication competences, can be a central measure to prevent and overcome the negative consequences of cyberbullying.

The semantic core of the stream, which reflects the push towards suicidal behavior, allows to identify the main techniques applied by the leaders of this stream - depreciation of human life, gamification in the process of formation of suicidal attitudes of the user audience and romanticization of suicides. Countering the involvement of adolescents in suicide networks should include legal measures, as well as mandatory and regular psychological support for adolescents whose behavior demonstrates markers of participation in suicidal online communities.

Linguistic analysis of reports belonging to the flow of school shooting reveals two main ways to mobilize extremist and terrorist attitudes of teenagers by network leaders: emotional rationalization of mass killings, involving primacy of motives of power, administration of educational institution, classmates, as well as glorification of terrorists; rational reasoning, applying the ideas of the concept of natural selection and denying the importance of morality and morality to society.

Significant measures to prevent the involvement of adolescents in online school shooting communities are their belief in the need to have an opinion, to critically sense, to reflex from various sides the information coming from the network; discuss what consciousness manipulation technologies are used in online groups mobilizing extremism and terrorism, and the benefits that network leaders derive from their criminal activity.

It is obvious that in conditions of internment-risks it becomes extremely important to manage effectively strategies of child behavior by teachers, parents and other participants of educational environment, to build in children resistance to emerging internment threats.

Countering the communication of schoolchildren to destructive network communities can be organized in the following areas:

- 1) demonstration of doubt of such sources of information and malice of their leaders;
- 2) proof of inaccuracy, damage, nullity of the destructive information itself;
- 3) switching the attention of the Internet audience to other information of constructive content.

The criteria for selecting the relevant content may be its entertainment (what can shift attention), logic (what meets common sense) and normative acceptability (what meets the rules of the reference group). Opposition to such content should consist in encouraging alternative creative actions through the formation and awakening of positive meanings, the popularization of acceptable standards of behavior and role models.

The effectiveness of countering destructive network communities in all three areas mentioned above can be facilitated by neuro-visual techniques such as the use of well-known warning symbols, the management of discourse by changing attention concentrator objects, the targeted use of verbal and graphic metaphors. Thus, our eye tracking studies with the help of eye trackers show that additional mobilization in the perception of graphic images can be provided by the use of familiar symbol-warnings. The appearance of a red line on the computer screen for 7-10 seconds in combination with the inscription of the type "Beyond the line it is impossible!" significantly reduced the time of respondents to consider high-risk zones and increased the time of view stay in safe zones. For example, when looking at a person on a computer screen standing on the edge of a cliff, on the ledge of a high-rise building, on a rock, the time of sight in places of possible fall after the demonstration of a red line inadvertently decreased on average more than twice (567 respondents participated in experiments). At the same time, the time of sight in safe places of such images increased more than one and a half times.

With the help of the eye tracker, we have also found multiple manifestations of changing the nature of information perception by changing attention concentrator objects. Such a change is easily ensured by increasing the font of one of the verbal fragments of the visual stimulus, its color, highlighting, features of the design, as well as by purposeful introduction of such elements. Similarly, they act on the perception of the proposed content of metaphor drawings (for example, all known "emoji," recognizable images of fairy characters, etc.).

The authors of the article have compiled a list of recommendations for prevention and counteraction of risks considered in the article for teachers, counselors, specialists in the field of educational work.

Recommendations for preventing and combating cyberbullying:

- presence of teachers, counselors, experts in the field of education in global network;

- monitoring of the teenager accounts and the immediate environment;
- formation of the acceptance and identity culture among children;
- "social producing" and navigation of students and pupils in search of friendly online communities.

Recommendations for preventing and combating suicidal behavior in the Internet environment:

- direct and immediate designation of teachers and counselors presence at Internet space;
- operational appeal to management of an electronic resource;
- operational appeal to law enforcement agencies;
- creation of group for friends, relatives, the immediate environment support/notification about this risk;
- professional psychological maintenance;
- changing activity (after overcoming crisis) on game types of activity (sport, tourism, quests).

Recommendations on preventing and combating the dissemination of extremist, terrorist content and involvement in extremist, terrorist activities (school shooting) on the Internet:

- an appeal to the necessity of having the personal opinion;
- stimulation of critical thinking development;
- offering alternatives and switching attention to socially useful activity;
- help in reflection of terrorist and extremist content;
- discussion of consciousness manipulation technologies;
- development of the students communication culture on the Internet in school, installation on immediate informing adults on any threats or alarms connected with Internet communication.

Thus, the formation and development of a culture of digital citizenship in Russia is possible due to the interaction of civil and government structures aimed at creating conditions to minimize the negative effects of Internet communications and maximize the opportunities that open up in the digital environment: social project activities, civic activism, and digital democracy.

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