SOCIAL PSYCHOLOGY

Research article

Relationship Among the Tendency to Cyber-Aggression, Aggressiveness, and Empathy in Adolescence

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Abstract

Introduction. This study aims to examine the relationship among the tendency to various forms of cyber-aggression, aggressiveness, and empathy in adolescence. Cyber-aggression is understood as the deliberate infliction of harm on other Internet users. The forms of cyber-aggression are distinguished on the basis of a typological model of cyber-aggression proposed by K. Runions, which was first used to analyze the online behavior of Russian adolescents.

Methods. The study involved 196 adolescents aged between 12 and 15 years. Empirical data were collected using the Cyber-Aggression Typology Questionnaire modified for Russian-speaking respondents, the Buss–Perry Aggression Questionnaire modified by S. N. Enikolopov, and the Balanced Emotional Empathy Scale by Mehrabian (modified by N. Epstein).

Results. There was no relationship among the tendency to cyber-aggression, aggressiveness, and empathy, which would be universal throughout the entire adolescence. The tendency to cyber-aggression significantly correlates with aggressiveness after 14 years of age and with empathy after 15 years of age. Aggressiveness is not a significant predictor of adolescent cyber-aggression; empathy determines the tendency to cyber-aggression (with a negative sign) only among 15-year-old adolescents.

Discussion. We assumed that cyber-aggression has different psychological meanings at various stages of adolescence – cyber-aggression as a form of 'social tests' in early adolescence, which is not related to personality traits of an individual, and cyber-aggression as a manifestation of stable personality traits (primarily, lack of empathy) in late adolescence.

Conclusion. We can draw a conclusion that there is a need for a differentiated approach to prevention and correction of adolescent cyber-aggression that takes into account its psychological meanings at various stages of adolescence.

Keywords

cyber-aggression, adolescents, aggressiveness, physical aggression, verbal aggression, empathy, motives of cyber-aggression, cyber-aggression predictors, age dynamics, gender differences

Antipina, Miklyaeva
Relationship Among the Tendency to Cyber-Aggression, Aggressiveness, and Empathy in Adolescence
Russian Psychological Journal, 2021, Vol. 18, No. 2, 94–108. **doi**: 10.21702/rpj.2021.2.6

Highlights

➢ The relationship among the tendency to cyber-aggression, aggressiveness, and empathy differ depending on the age of adolescents.

➢ In the samples of 12- and 13-year-old adolescents, we observed no relationship among the tendency to cyber-aggression, aggressiveness, and empathy.

➢ In the sample of 14-year-old adolescents, the tendency to cyber-aggression positively correlates with verbal aggressiveness; in the sample of 15-year-olds there is a positive correlation with verbal aggressiveness and the total score of aggressiveness, as well as a negative correlation with empathy.

➢ Empathy is a negative predictor of the tendency to cyber-aggression only in the sample of 15-year-old adolescents; aggressiveness does not show any significant contribution to cyber-aggression in adolescents regardless of their age.

Introduction

A rapid development of Internet communications affects all spheres of human life today. The Internet has long ceased to be merely an information space and turned into a space for online interaction. TNS Russia, one of the leading Russian media research companies, draws attention to the fact that the community of Internet users is getting younger every year, and today's adolescents and young adults predominate among those who use the Internet for communication purposes (Moskvichev, 2018), often perceiving online communication to be simpler and more convenient than offline one. At the same time, this category of Internet users is characterized by significant risks associated with a special Internet phenomenon of cyber-aggression, which can manifest itself both in various forms of cyber-victimization of adolescents and young adults (e.g., trolling, hating, etc.) and in development of a tendency to show aggression towards Internet communication partners. The importance of the cyber-aggression problem among adolescents and young adults is emphasized by a widespread occurrence of this phenomenon, which is confirmed both by Russian (Soldatova, Rasskazova, & Chigar'kova, 2020) and global studies (Gámez-Guadix, Orue, Smith, & Calvete, 2013; Wright et al., 2015). Thus, according to the report by the World Health Organization (WHO), in the age group of 11 years, Russia ranks first in cyber-aggression ahead of Greenland, Lithuania, Bulgaria, Ukraine, and Latvia; it also ranks third in the prevalence of cyberbullying among 13- and 15-year-olds (Soldatova, L'vova, & Permyakova, 2018). More than half of Russian adolescents face various forms of cyber-aggression, while acting in different roles – as a witness, victim, or aggressor (Soldatova, Chigar'kova, & L'vova, 2017).

SOCIAL PSYCHOLOGY

Cyber-aggression is a deliberate infliction of harm on other Internet users in order to assert one's own personal value (Gini, Card, & Pozzoli, 2018), which can be performed through various forms of online behavior, such as sending humiliating messages, public insults, distribution of derogatory materials, damage to personal photos, etc. (Corcoran, Mc Guckin, & Prentice, 2015). The usual goal of a cyber-aggressor is to harm a victim, and the psychological meaning of his/her actions is to feel strength, to take revenge on offenders, or to demonstrate superiority (Wright, 2017). Obviously, the indicated characteristics of cyber-aggression are to a certain extent consistent with age-related goals of development that are relevant in adolescence, which increases the risk of developing a tendency to cyber-aggression at this age.

Another reason that determines the high risk of developing a tendency to cyber-aggression in adolescence is associated with special characteristics of the Internet space, which determine the fundamental differences between cyber-aggression and offline violence. They include the absence of spatial and temporal limitations on Internet communication, expanded audience, anonymity of the cyber-aggressor, his/her remoteness from the victim and, as a consequence, aggressor's 'online disinhibition' (Suler, 2004), accompanied by a decrease of self-control over his/her own aggressive manifestations (Espelage, Low, Polanin, & Brown, 2013) and feedback distortion (Bochaver & Khlomov, 2014), which can be expressed in finding additional reasons for showing aggression. In addition to the deficit of self-control, the adults have difficulties in controlling adolescents' online behavior, due to which adolescent cyber-aggression is much less regulated by adults than offline violence (Goldstein, 2015; Soldatova et al., 2020).

Increased vulnerability of adolescents to the risk of developing a tendency to cyber-aggression determines the relevance of research on protective factors that could prevent reinforcement of corresponding behavior patterns. It seems that one of the ways to solve this problem is associated with determination of personal correlates of the tendency to cyber-aggression. Research on the relationship between adolescents' personality traits and their tendency to cyber-aggression has been quite active over the last decade and a half. The most frequently discussed correlates of the tendency to cyber-aggression include, among others, aggressiveness and empathy, which have been established as reliable predictors of cyberbullying (Eisenberg, Eggum, & Di Giunta, 2010; Ang, Li, & Seah, 2017) – a form of cyber-aggression (Corcoran et al., 2015) – as well as evidence of persistent negative relationship between aggressiveness and empathy (e.g., Suvorova, Sorokoumova, & Frundina, 2017).

The most obvious conclusions about the nature of the relationship among the tendency to cyber-aggression, empathy, and aggressiveness imply that aggressiveness as a stable personality trait of an adolescent acts as a predictor of the tendency to cyber-aggression, whereas empathy, on the contrary, acts as a protective factor. Indeed, the latest publications present empirical data, which demonstrate that cyber-aggression is associated with a high level of aggressiveness (Sharov, 2020), and describe back-and-forth transitions (inversions) of cyber-aggression and offline violence (Len'kov, 2020), among other things using the model of cyberbullying as a form of cyber-aggression. At the same time, it was observed that adolescents perceive cyber-aggression in a fundamentally different way compared to offline violence, which they treat as a much less dangerous phenomenon (Pornari & Wood, 2010). This may be a factor that affects aggressiveness in online communication by strengthening the relationship between violence and cyber-aggression or significantly transforming it. Another important fact is that there are no level differences in cyber-aggression between adolescent girls and boys (Álvarez-García, Barreiro-Collazo, & Núñez, 2017),

which contradicts the conventional idea about the differences in offline aggressiveness between men and women (e.g., Enikolopov & Tsibul'skii, 2007). This is also true for the negative relationship between cyber-aggression and empathy, which is confirmed by some studies (Rodríguez-Hidalgo, Mero, Solera, Herrera-López, & Calmaestra, 2020) and refuted by the others, according to which empathy cannot be considered as a significant correlate of cyber-aggression (on the example of cyberbullying: Athanasiades, Baldry, Kamariotis, Kostouli, & Psalti, 2016).

These contradictions in the analysis of the relationship among the tendency to cyber-aggression, aggressiveness, and empathy, can probably be explained by different ways of conceptualizing the phenomenon of cyber-aggression, in particular, the tendency to equate the concepts of 'cyber-aggression' and 'cyberbullying', which in fact describe two separate phenomena that differ in the degree of regularity and deliberation of the aggressor's behavior, as well as the victim's ability to resist the aggressor. In contrast to cyberbullying, which represents repeated intentional acts of aggressive behavior by an individual or a group, carried out on the Internet against a victim who does not have the resources to stop this behavior (Smith et al., 2008), the phenomenon of cyber-aggression encompasses a much wider range of behaviors. In particular, manifestations of cyber-aggression vary significantly in terms of motives that induce aggression on the Internet.

In this regard, more than a decade ago it was proposed to draw a distinction between reactive and proactive cyber-aggression, depending on the fact whether aggressive behavior was a reaction to provocation from other Internet users or it was initiated by the subject himself/herself. In 2013, K. Runions proposed a typology of cyber-aggression, in which the motives of aggressive online behavior were considered from the perspective of two orthogonal factors: the source of motivation (one's own initiative or actions of the communication partner, provoking an aggressive response) and the level of self-control (impulsive or controlled cyber-aggressive reaction).

Therefore, a classification was proposed to identify the following four main motives for adolescent cyber-aggression: rage, revenge, recreation, and reward (Runions, 2013). Aversive (in other words, reactive) cyber-aggression can be an impulsive reaction to provocations from other users ('rage'), or it can be carried out voluntarily, as a deliberate act aimed at punishing the offender, which is based on self-control ('revenge'). Appetitive (proactive) cyber-aggression can also take impulsive and controlled forms. Impulsive appetitive cyber-aggression manifests itself in spontaneous actions, carried out without regard to long-term consequences ('recreation'); controlled appetitive cyber-aggression manifests itself in controlled actions, aimed at achieving positive effects in the long term, e.g., receiving benefits in relationships with important persons ('reward'). Unlike reactive cyber-aggression, which is determined by negative emotions of the cyber-aggressor, resulting from interaction with online communication partners, manifestations of proactive cyber-aggression are dictated by positive emotions from current aggressive acts (Runions, Bak, & Shaw, 2017).

The authors of the model described above suggest that these types of motives for cyber-aggression differ in their psychological nature. However, empirical data that would help substantively specify and verify this hypothesis are rather fragmentary. This determined *the aim of our research*, which was to study the relationship between the tendency of adolescents to various forms of cyber-aggression and their personal characteristics, which may be considered as predictors of cyber-aggression – aggressiveness and empathy. The main research question was how the tendency to various types of cyber-aggression, aggressiveness, and empathy correlate with each other in adolescents. Moreover, given the results of our previous studies, which indicated that the tendency to cyber-aggression was affected by age and gender (Antipina, Bakhvalova, &

Antipina, Miklyaeva
Relationship Among the Tendency to Cyber-Aggression, Aggressiveness, and Empathy in Adolescence
Russian Psychological Journal, 2021, Vol. 18, No. 2, 94–108. **doi**: 10.21702/rpj.2021.2.6

SOCIAL PSYCHOLOGY

Miklyaeva, 2019), we were interested whether the nature of the relationship among the tendency to cyber-aggression, aggressiveness, and empathy changed as adolescents grew older and whether there were differences between the samples of adolescent boys and girls.

Methods

The study involved 196 adolescent school students from St. Petersburg aged between 12 and 15 years (55.1 % females, 46.9 % males), including 50 respondents aged 12, 58 respondents aged 13, 44 respondents aged 14, and 44 respondents aged 15. The adolescents took part in the study voluntarily in out-of-school hours. We obtained informed consent for participation in the study from each adolescent, as well as from his/her parents/legal representatives.

Empirical data was collected by means of questionnaire survey and testing. The questionnaire contained items on socio-demographic characteristics; the testing aimed at assessing the tendency to cyber-aggression and its potential personal predictors – aggressiveness and empathy. The tendency to cyber-aggression was evaluated using the Cyber-Aggression Typology Questionnaire (Runions et al., 2017), modified for Russian-speaking respondents. The questionnaire assessed the tendency to various types of cyber-aggression: (a) impulsive-appetitive, (b) impulsive-aversive, (c) controlled-appetitive, and (d) controlled-aversive (the first three scales include 6 items, the last one – 5, the total number of questions is 23; each item is evaluated on a scale from 1 to 4). Aggressiveness was assessed using the Buss-Perry Aggression Questionnaire modified by S. N. Enikolopov (a version with 29 items that contains four scales: physical aggression, anger, hostility, and verbal aggression) (Enikolopov & Tsibul'skii, 2007). Empathy was assessed using the Balanced Emotional Empathy Scale by Mehrabian, modified by N. Epstein (Il'in, 2011).

Statistical processing of the data was performed using Statistica 10.0 software package and implemented in two stages. The first stage involved calculating descriptive statistics ($M \pm S$) and determining the type of parameter distribution using the Shapiro–Wilk test. The results showed that data distribution was close to normal with a confidence level of 0.95–0.99 (for different parameters). Taking into account information about the type of data distribution, at the second stage we estimated the differences between the subgroups formed by age and gender using one-way ANOVA (F), as well as the relationship among the characteristics by means of correlation analysis (Pearson correlation coefficient, r), regression analysis (B), and cluster analysis.

Results

The results of the study demonstrate that in the process of data analysis, performed on the full sample, only one rather weak correlation was observed among the scores of cyber-aggression, aggressiveness, and empathy – namely, between the scores of impulsive-aversive and verbal aggression ($r = 0.14$ at $p = 0.05$). At the same time, various types of cyber-aggression are characterized by a strong positive correlation with each other ($0.62 \leq r \leq 0.92$ at $p < 0.001$). It is also true for aggressiveness ($0.15 \leq r \leq 0.80$ at $p \leq 0.05$), whereas empathy has a positive correlation with anger and hostility ($0.18 \leq r \leq 0.22$ at $p < 0.01$) and negatively correlates with physical aggression ($r = -0.22$ at $p = 0.01$). We also observed negative correlation between cyber-aggression and the age of respondents ($-0.23 \leq r \leq -0.17$ at $p < 0.05$) (Table 1). Regression analysis, performed on the full sample, did not yield a statistically significant regression model. Hence, we assumed that cyber-aggression could differ in terms of its personal determination, i.e., it could be supported by different personality traits.

Antipina, Miklyaeva
Relationship Among the Tendency to Cyber-Aggression, Aggressiveness, and Empathy in Adolescence
Russian Psychological Journal, 2021, Vol. 18, No. 2, 94–108. **doi**: 10.21702/rpj.2021.2.6

SOCIAL PSYCHOLOGY

Table 1

Descriptive statistics and correlation coefficients (for the full sample)

Charac-teristics	M	S	2	3	4	5	6	7	8	9	10	11	12
1. Age	13.37	1.16	–0.17*	–0.21**	–0.22**	–0.23**	–0.23**	0.01	0.05	0.04	0.18**	0.04	0.17*
2. Im-pulsive-aversive CA	16.87	5.71	1.00	0.71***	0.84***	0.73***	0.92***	0.07	0.09	0.04	0.14*	0.09	–0.02
3. Cont-rolled-aversive CA	16.76	4.57		1.00	0.74***	0.62***	0.84***	0.10	0.08	–0.03	0.06	0.07	–0.10
4. Cont-rolled-appeti-tive CA	18.08	6.39			1.00	0.84***	0.96***	0.02	0.11	0.05	0.09	0.08	–0.04
5. Impul-sive-ap-petitive CA	14.44	4.94				1.00	0.89***	0.05	0.04	0.01	0.04	0.05	–0.10
6. Cyber-aggres-sion (total)	66.26	19.47					1.00	0.06	0.09	0.02	0.09	0.08	–0.07
7. Phy-sical aggres-sion	19.22	6.82						1.00	0.32***	0.22**	0.36***	0.72***	–0.22**
8. Anger	18.20	5.78							1.00	0.53***	0.46***	0.80***	0.18**

Antipina, Miklyaeva
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Russian Psychological Journal, 2021, Vol. 18, No. 2, 94–108. **doi**: 10.21702/rpj.2021.2.6

SOCIAL PSYCHOLOGY

Table 1

Descriptive statistics and correlation coefficients (for the full sample)

Charac-teristics	M	S	2	3	4	5	6	7	8	9	10	11	12
9. Hostility	18.20	5.61								1.00	0.15*	0.75***	0.28**
10. Verbal aggression	13.45	3.51									1.00	0.43***	–0.03
11. Aggressiveness (total)	55.61	13.57										1.00	0.08
12. Empathy	67.52	11.43											1.00

*Note: CA – cyber-aggression; * – p ≤ 0.05; ** – p ≤ 0.01; *** – p ≤ 0.01.*

In order to test this hypothesis, the respondents were divided into groups by means of cluster analysis (Ward's method, by cases) (Table 2). The first group consisted of 58 adolescents with a slight predominance of girls (65.5 %). In this sample, distinct manifestations of cyber-aggression were combined with high scores of anger, hostility, and empathy. The second group consisted of 76 respondents with a relative predominance of boys (55.3 %). This group was also characterized by high scores of cyber-aggression combined with high scores on the scale of physical aggression. The third group comprised 62 people (59.7 % of girls and 40.3 % of boys) and was distinguished by low values of all cyber-aggression parameters. In addition to these differences, cluster analysis revealed that age was another significant characteristic. The 'youngest' sample was group 2, where high scores of cyber-aggression were associated with distinct manifestations of physical aggression as a component of aggressiveness. The most 'adult' sample was group 3,

Antipina, Miklyaeva
Relationship Among the Tendency to Cyber-Aggression, Aggressiveness, and Empathy in Adolescence
Russian Psychological Journal, 2021, Vol. 18, No. 2, 94–108. **doi**: 10.21702/rpj.2021.2.6

SOCIAL PSYCHOLOGY

characterized by the lowest scores of cyber-aggression. Meanwhile, the differences in the number of boys and girls in each group were not statistically significant.

Table 2
Descriptive statistics (M ± S) for subgroups derived by cluster analysis

Characteristics	Group 1 (n = 58)	Group 2 (n = 76)	Group 3 (n = 62)	F
Age	13.51 ± 1.14	13.18 ± 1.09	13.73 ± 1.28	5.05*
Impulsive-aversive CA	19.74 ± 3.73	18.67 ± 4.22	8.90 ± 3.40	210.5***
Controlled-aversive CA	18.72 ± 3.24	17.88 ± 3.48	11.54 ± 4.72	102.6***
Controlled-appetitive CA	21.17 ± 3.79	20.18 ± 4.23	8.71 ± 4.76	249.7***
Impulsive-appetitive CA	15.87 ± 3.66	15.94 ± 3.92	8.71 ± 4.44	108.3 ***
Cyber-aggression (total)	75.51 ± 11.60	72.66 ± 13.20	37.85 ± 14.60	239.4***
Physical aggression	16.06 ± 4.21	21.16 ± 7.19	17.20 ± 5.99	4.47*
Anger	19.79 ± 4.84	18.24 ± 6.03	15.76 ± 5.34	8.78**
Hostility	20.49 ± 5.92	17.42 ± 5.29	17.24 ± 5.46	5.57**
Verbal aggression	13.23 ± 3.76	13.73 ± 3.63	12.61 ± 2.67	–
Aggressiveness (total)	53.34 ± 10.21	56.79 ± 14.73	50.20 ± 12.37	–
Empathy	76.91 ± 6.65	64.09 ± 9.92	65.83 ± 13.24	7.70**

*Note: CA – cyber-aggression; * – p ≤ 0.05; ** – p ≤ 0.01; *** – p ≤ 0.01.*

Antipina, Miklyaeva
Relationship Among the Tendency to Cyber-Aggression, Aggressiveness, and Empathy in Adolescence
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SOCIAL PSYCHOLOGY

The results obtained demonstrate that it is necessary to take into account the factors of adolescents' age and gender when searching for predictors of adolescent cyber-aggression. The analysis of descriptive statistics, calculated taking into account age and gender of the respondents (Table 3), shows that cyber-aggression scores stand at a relatively high level in the samples of 12–14-year-old adolescents and significantly decrease by the age of 15; notably, this trend is typical of both boys and girls ($5.19 \leq F \leq 7.81$ at $p < 0.01$). The scores of aggressiveness and empathy remain more or less constant throughout adolescence; the scores of empathy, anger, and hostility are significantly higher in the sample of girls ($6.77 \leq F \leq 38.18$ at $p < 0.01$), whereas the score of physical aggression is much higher in the sample of boys ($F = 37.86$ at $p < 0.001$).

Table 3

Descriptive statistics characterizing subgroups of adolescents taking into account age and gender

Charac-teristics	Age				F	Gender		F
	12 years	13 years	14 years	15 years		G	B	
Impulsive-aversive CA	17,54 ± 5,05	16,95 ± 5,91	18,75 ± 4,08	14,11 ± 6,64	5,19**	17,16 ± 5,80	16,51 ± 5,62	–
Controlled-aversive CA	17,60 ± 3,47	16,69 ± 4,51	18,50 ± 3,39	14,16 ± 5,62	7,81***	16,50 ± 4,71	17,08 ± 4,39	–
Controlled-appetitive CA	19,62 ± 5,53	18,05 ± 6,64	20,07 ± 4,11	14,36 ± 7,35	7,31***	18,37 ± 6,56	17,72 ± 6,19	–
Impulsive-appetitive CA	15,60 ± 4,54	14,53 ± 5,05	15,82 ± 3,24	11,61 ± 5,57	7,10***	14,60 ± 5,02	14,24 ± 4,86	–
Cyber-aggression (total)	70,36 ± 15,43	66,22 ± 20,63	73,14 ± 11,90	54,25 ± 23,35	5,62***	66,93 ± 16,99	65,93 ± 19,93	–
Physical aggression	18,02 ± 5,99	19,90 ± 7,81	21,23 ± 6,42	17,70 ± 6,26	–	16,68 ± 5,45	22,35 ± 7,05	37,68***

Antipina, Miklyaeva
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Russian Psychological Journal, 2021, Vol. 18, No. 2, 94–108. **doi**: 10.21702/rpj.2021.2.6

SOCIAL PSYCHOLOGY

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Charac-teristics	Age				F	Gender		F
	12 years	13 years	14 years	15 years		G	B	
Anger	17,36 ± 5,62	18,71 ± 5,73	19,57 ± 6,09	17,14 ± 5,51	–	19,29 ± 5,38	16,88 ± 5,99	9,30**
Hostility	17,72 ± 5,30	19,19 ± 6,22	17,30 ± 5,64	18,34 ± 5,03	–	19,18 ± 5,88	17,00 ± 5,05	6,77**
Verbal aggression	12,56 ± 3,68	13,41 ± 3,49	13,89 ± 3,29	14,07 ± 3,46	–	13,45 ± 3,99	13,44 ± 2,83	–
Aggressive-ness (total)	53,20 ± 13,15	57,79 ± 14,79	58,05 ± 13,18	53,05 ± 12,19	–	55,14 ± 12,74	56,19 ± 14,58	–
Empathy	64,74 ± 13,08	67,93 ± 10,58	66,57 ± 11,46	71,07 ± 9,74	–	71,69 ± 11,58	62,40 ± 8,93	38,19***

Note: CA – cyber-aggression; G – subgroup of girls; B – subgroup of boys; ** – p ≤ 0.01; *** – p ≤ 0.01.

The comparison of the scores that characterize various types of aggression enabled us to state that both in the full sample and in the subgroups formed by age and gender the predominant type is controlled-appetitive cyber-aggression. However, these differences do not reach statistically significant values.

Correlation analysis, carried out separately for each age and gender group, did not reveal any specific relationship among the tendency to cyber-aggression, aggressiveness, and empathy in the samples of boys and girls. However, it showed an increase in the number of correlations among these scores as the adolescents grew older. In the samples of 12- and 13-year-old respondents, no such correlations were found, whereas in the sample of 14-year-olds, there was a significant correlation between the tendency to cyber-aggression and verbal aggression (r = 0.31 at p = 0.05). In the sample of 15-year-olds, we found three correlation – with verbal aggression, with the total score of aggressiveness, and with empathy (r = 0.32, r = 0.36, and r = –0.30 at p = 0.05, respectively). At the same time, using regression analysis we obtained a single statistically reliable regression model, according to which the predictor of impulsive-aversive cyber-aggression among 15-year-old adolescents is verbal aggression, which explains 18.5 % of its variance (Table 4).

Antipina, Miklyaeva
Relationship Among the Tendency to Cyber-Aggression, Aggressiveness, and Empathy in Adolescence
Russian Psychological Journal, 2021, Vol. 18, No. 2, 94–108. **doi**: 10.21702/rpj.2021.2.6

SOCIAL PSYCHOLOGY

Table 4

Results of regression analysis (sample of 15-year-old adolescents), $R^2 = 0.19$

Predictors of cyber-aggression	b*	Std. Err. of b*	b	Std. Err. of b	t	p
Verbal aggression	0.44	0.21	0.84	0.41	2.06	0.05

Discussion

The results of our study do not confirm that aggressiveness and empathy are stable correlates and especially reliable predictors of adolescent cyber-aggression. These findings agree with the information on the absence of the linear relationship among the tendency to cyber-aggression, aggressiveness, and empathy, obtained by other authors (Athanasiades et al., 2016; Pornari & Wood, 2010) and established in our previous studies (in particular, regarding the relationship between cyber-aggression and aggressiveness), carried out using projective methods for examining personality traits of adolescents (Antipina et al., 2019). Although the identified correlations among the tendency to cyber-aggression, aggressiveness, and empathy reflect an expected positive correlation between the tendency to cyber-aggression and aggressiveness (primarily, verbal one), they are extremely fragmented and rather weak. In our opinion, these results support an assumption that cyber-aggression, which is understood as a wide range of behavioral reactions on the Internet that are determined by qualitatively different motives, is not identical to the manifestations of aggression in the offline environment and has variable associations with personality traits of adolescents.

Using cluster analysis we identified that, in some cases, high scores of the tendency to cyber-aggression may be associated with a higher level of physical aggression, which indicates the possibility of transferring aggressive tendencies from offline interaction to the Internet space, where due to the impossibility of physical influence on the communication partner the usual ways of showing aggression probably become transformed. In other cases, high scores of cyber-aggression demonstrate a correlation with high empathy scores, coupled with high values of such aggressiveness parameters as anger and hostility, which, in all likelihood, indicate potential emotion-generating capacity of cyber-aggression situations for adolescents, combined with a fundamentally different (compared to offline interaction) interpretation of occurring events and, particularly, estimation of harm that one's actions inflict on the victim of aggression. Researchers demonstrated that online interaction is different from offline communication, particularly in terms of underestimating the consequences of one's own morally loaded actions (Bouhnik & Mor, 2014). It probably enables adolescents to use empathy resources to understand possible reactions of the victim, but it does not make them stop aggressive actions, since the aggressor does not see their consequences as serious enough. It should be noted that, apparently, the

described relationship between the tendency to cyber-aggression and empathy are more typical for younger adolescents, whose empathy is in the process of development. When the respondents approach late adolescence, empathy acquires the status of a negative predictor of the tendency to cyber-aggression, i.e. becomes a protective factor against manifestations of aggression in the Internet environment.

According to the results obtained, the relationship among the tendency to cyber-aggression, aggressiveness, and empathy in adolescence is more affected by age than by gender. In our study, no differences were observed between the intensity of different types of cyber-aggression in girls and boys, which is consistent with the data presented by other authors (Álvarez-García et al., 2017). We also found no gender-specific correlates and predictors of the tendency to cyber-aggression, despite the statement of expected differences in aggressiveness and empathy scores (according to the data available in the literature, e.g., Enikolopov & Tsibul'skii, 2007; Yusupov, 1995). At the same time, the results demonstrated age-related dynamics of the tendency to cyber-aggression of various types, which is characterized by statistically significant decrease of respective indicators by the age of 15. Samples of 12-, 13-, and 14-year-old adolescents show similar trends, which include (a) a wider spread of the rates, characterizing the tendency to cyber-aggression of various types, with some predominance of controlled-appetitive cyber-aggression ang (b) almost complete absence of significant correlations among the tendency to cyber-aggression, aggressiveness, and empathy. In the sample of 15-year-olds, the scores of various types of cyber-aggression are almost equal, and their correlation with personality traits is much stronger.

Based on the results, characterizing age-related dynamics of the tendency to cyber-aggression in relation to aggressiveness and empathy, we may assume that in the early stages of adolescence, cyber-aggression is not a personality-determined behavior but a kind of 'social test', in which adolescents explore various opportunities of interacting with others in the Internet environment, which they perceive as a more secure environment. Therefore, they tend to underestimate the risks that follow from their aggressive actions, supported by various motives and aimed at inflicting harm on their online communication partner. Notably, these assumptions are to some extent consistent with the results of our previous studies, according to which cyber-aggression in the early stages of adolescence is significantly less correlated with problem behavior compared to the samples of late adolescents (Antipina et al., 2019). By late adolescence, the situation changes. 'Social tests' gradually lose their relevance, and stable personality traits of adolescents begin to play an increasingly important role in online interaction. The age of 15 seems to be critical, but this conclusion needs to be specified by recruiting older respondents, which is the direction of our future research.

Conclusion

Therefore, our study demonstrated that the tendency to cyber-aggression, aggressiveness, and empathy do not exhibit any strong linear relationships, which would be universal throughout adolescence. Aggressiveness (primarily, verbal one) and empathy become significant correlates of cyber-aggression only at the ages of 14 and 15, respectively. At the previous stages of adolescence, no relationship is observed between the tendency to cyber-aggression and personality traits. At the same time, regardless of age, aggressiveness is not a significant predictor of the tendency to cyber-aggression. Empathy acquires this status only in a sample of 15-year-old adolescents.

Antipina, Miklyaeva
Relationship Among the Tendency to Cyber-Aggression, Aggressiveness, and Empathy in Adolescence
Russian Psychological Journal, 2021, Vol. 18, No. 2, 94–108. **doi**: 10.21702/rpj.2021.2.6

SOCIAL PSYCHOLOGY

The results obtained in our study indicate the need for a differentiated approach to the prevention and correction of adolescent cyber-aggression, taking into account age-related characteristics of aggressive behavior in the Internet environment. In the early stages of adolescence, prevention and intervention programs can concentrate on tasks, associated with creating the conditions for adolescents to become aware of the motives behind their 'social tests' in online interaction, as well as their consequences for communication partners and future relationships with them. In late adolescence, such work involves creation of favorable conditions for the development of empathy, the deficit of which becomes a significant predictor of the tendency to cyber-aggression at this stage of personal development.

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S. S. Antipina developed of the research program, modified the Cyber-Aggression Typology Questionnaire, collected and processed the empirical data, formulated conclusions, and prepared the manuscript.

A. V. Miklyaeva supervised the study, wrote the theoretical overview, prepared the manuscript, and edited the manuscript according to the journal requirements.

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