

The Relationship Between Video Game Characteristics and the Individual Psychological Traits of Students

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This article presents a study that aims to identify the relationship between the characteristics of video games and the individual psychological traits of students. The study involved 203 people (87% women; $M = 19.39$ years; $S.D. = 2.25$), all of whom were first and second year students of the Moscow State University of Psychology and Education. The following research methods were used: a specially designed questionnaire aimed at assessing video game preferences and emotions experienced in the gaming process, J. Raven's Advanced Progressive Matrices, the Structure of Temperament Questionnaire by I.N. Trofimova and V.M. Rusalov. The study revealed that the most popular video game genres among the students are the «information games» and «action games». «Time-killers» was the least popular genre. The study also provides results indicating that there is no correlation between the preferred video game genre and temperament traits. A link is suggested between game mechanics and gaming time as well as indicators of emotional state in the gaming process.

Keywords: video games, computer games, video game genres, temperament, abstract intelligence, individual psychological characteristics of students.

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В данной статье представлены материалы исследования, целью которого является выявление взаимосвязи характеристик видеоигр и индивидуально-психологических особенностей студентов. В исследовании приняли участие 203 человека (87% девушек; $M=19,39$ лет; $SD=2,25$) – учащиеся первых и вторых курсов Московского государственного психолого-педагогического университета. В качестве методов исследования использовались: специально разработанный опросник, направленный на оценку видеоигровых предпочтений и испытываемых во время игры эмоций, и опросник структуры темперамента И.Н. Трофимовой и В.М. Русалова. В результате исследования определены наиболее популярные жанры видеоигр среди студентов: игры информации и игры действия. Наименее популярным жанром являются «таймквиллеры». Также в исследовании приводятся результаты, указывающие на отсутствие связи между предпочитаемым жанром видеоигр и чертами темперамента. Выявлены взаимосвязи между игровыми механиками и временем за игрой, а также показателями эмоционального состояния в процессе игры.

Ключевые слова: видеоигры; компьютерные игры; жанры видеоигр; темперамент; абстрактный интеллект; индивидуально-психологические особенности студентов.

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Introduction

Nowadays, the world of video games has become an integral part of many adolescents' and young men's lives, having a significant impact on their psyche and behavior. The development of technology and the availability of a variety of gaming platforms have led to a variety of genres and characteristics (aspects) of video games, raising questions about the impact of these games on the individual-psychological characteristics of those who play. According to RPORC data for 2022, about 23% of Russians are fond of video games, with the main audience of players being young people [0]. Among 18-24-year-olds, up to 56% of people are fond of video games, of which 20% play daily. Compared to older groups, only 10% of Russians aged 60 and older play video games. It is noted that interest in this form of entertainment also depends on gender: men play 2.6 times more often than women (34% vs. 13%). Clearly, we are seeing an upward trend, and the number of adults and children who are passionate about video games is only growing.

A number of researchers have noted that the prevalence of video games has a significant impact on the socialization of children and adolescents [0; 0; 0]. In this regard, psychologists face the task of studying the effect of the influence of video games on the psyche of players. Thus, the attention of many authors has been directed to the relationship between computer games and the cognitive sphere: a study [0] found that video games of the “action” genre contribute to the increase of memory and attention resources in players. More recent work [0] suggests improvements in visual-spatial reasoning. Schemes for integrating video games into the educational process, particularly in conjunction with other multimedia learning formats, have also been described [0].

Another question that is often asked in connection with the proliferation of video games is their impact on the emotional sphere, in particular, the impact of violent and violent games on the level of aggression [0]. Despite evidence that suggests correlations between playing certain types of video games and a person's level of aggression [0], there are other findings regarding the emotional state of players - increased enthusiasm and the role of positive motivation and psychological well-being have been noted [12]. In addition, there are known cases of video games being used as a tool for emotional regulation [0; 0], which also indicates a positive emotional impact of a certain type of video game on the player.

It is also important to note that questionnaires and post-interviews remain the leading methods in research on the influence of video games on the mental state of adolescents and young men. However, studies using psychophysiological diagnostic methods are gaining popularity now, including the oculography method [0], which allows for a more accurate assessment of situations of social interaction during the game and individual styles of activity during the game.

Summarizing, we can note that there is no unambiguous opinion among researchers about the nature of the influence of aggressive video games on the emotional state of the subjects. Also, most studies consider video games in the aggregate, without differentiating them into genres, which can have different effects on the psychological state of players. Therefore, our study focuses on examining several research objectives:

1. To identify the actual preferences of students in choosing video games of different genres;
2. To evaluate the nature of the relationship between various characteristics of video games (genre and specific game mechanics) and individual-psychological characteristics of students.

Study design and methods

Sample. The sample consisted of 203 people (87% girls; $M=19.39$ years; $SD=2.25$) - first- and second-year students of Moscow State University of Psychology and Education in the following areas of training: psychology and pedagogical education. The students participated in the study in 2023 as part of their academic practice.

The following **methods** were used in the study:

1. To identify popular video games, we used a specially designed questionnaire aimed at assessing video game preferences and emotions experienced during the game. The questionnaire required respondents to answer eleven questions, including the following: “Do you play video games?” (yes/no), “At what age did you start playing video games?” (scale from 2 to 25 years old), “How much approximate time per day do you spend playing video games?” (scale from “less than 1 hour” to “more than 6 hours”), and “Do you require serious effort to stop playing?” (7 gradations from “never” to “almost always”). Study participants were also asked to list the names of the games they usually play and to indicate from a suggested list the degree of emotional reaction they experience while playing.

2. I.N. Trofimova and V.M. Rusalov's (2011) questionnaire [0; 0] was used to investigate the temperament structure. This questionnaire is a self-assessment test that measures 12 behavioral characteristics that are the most biologically determined, stable in human development and relatively independent of the situation. The results of this questionnaire were used to analyze indicators that define the following traits: motor-physical endurance, motor-physical pace, thrill-seeking, communication endurance (ability to communicate for long and/or intense periods of time), communication pace (speed of speech and reading), empathy (sensitivity to the feelings and motivations of others), plasticity (ease of switching from one activity to another and adaptability to changes in instructions or situations), tendency to think, optimism, impulsivity (initiating and initiating behavior), and temperament. Temperament was assessed to investigate the contribution of stable individual traits to game preferences.

Methods of mathematical processing: Pearson's correlation coefficient, Student's t-test for comparison of average indices between independent samples, one-factor analysis of variance with repeated changes (nonparametric variant - Friedman's test), Wilcoxon test (with Bonferroni correction for multiple comparisons) were used for mathematical processing of

data. All counts and statistical procedures were performed using R software version 4.3.0 (R Core Team 2020) (lavaan, psych, rstatix, emmeans, afex packages).

The battery of techniques was assembled into an online psychodiagnostic system using the survey and test building website “psytoolkit.org” [16; 17]. The respondents' task in our study was to complete this battery of techniques. Respondents completed this battery of techniques face-to-face in groups of no more than 10 people in order to ensure their physical comfort. Respondents were also asked to decide for themselves whether they wanted to be tested or otherwise practiced. The average time to complete the methods was 32 minutes.

This article is part of a large-scale study as part of the work of the Youth Lab investigating cognitive and communicative processes in adolescents and young men while solving game and learning tasks in digital environments of the MSUPE. In this article we focus exclusively on the data related to the relationship between video game characteristics and individual-psychological characteristics of students.

Results

The results of the study present data on: 1) the most popular video game genres among students; 2) the relationship between video game genres and students' individual psychological differences; 3) the relationship between game mechanics and students' individual psychological differences.

Our first step was to process a questionnaire aimed at assessing video game preferences and emotions experienced while playing. Table 1 shows the percentage of subjects who do and do not play video games. According to the questionnaire, 67.5% of the respondents play video games regularly.

Table 1

Number of Those Who Play and Do Not Play Video Games

Regularly Play Video Games	67,5%
Practically Do Not Play Video Games	32,5%

Table 2 presents data showing how much time respondents spend playing video games each day. One-third of respondents reported playing video games for less than one hour. This response was the most common in our sample. It is also worth noting that over twenty percent of respondents indicated that they play video games one or two hours a day. Thus, the majority of the sample spends up to two hours a day playing video games.

Table 2

Data on Time Spent Playing Video Games Per Day

Answer Option	Percentage of Respondents
Less than 1 hour	42,34%
1 hour	21,17%

2 hours	19,71%
3 hours	11,68%
4 hours	2,19%
5 hours	1,46%
6 hours	1,46%
More than 6 hours	0,00%

Table 3 presents data on how often respondents require serious effort to stop playing. Almost a third of the respondents (32.85%) rarely have difficulty in stopping the game. However, 5.84% of the respondents indicated that they often or almost always have difficulty in stopping the game. Thus, we can hypothesize that only 5.84% of the respondents in this sample may have a tendency to develop video game addiction.

Table 3

Data on the Distribution of Subjects' Responses to the Question of How Often They Require Serious Effort to Stop Playing Games

Answer Option	Percentage of Respondents
Never	19,71%
Almost never	27,01%
Rarely	32,85%
From time to time	14,60%
Often	4,38%
Almost always	1,46%
Always	0,00%

We would like to remind you that while filling out the questionnaire, we also asked respondents to name the video games they usually play. The respondents named a total of 589 games, including games that were named more than once. We identified the three most popular games among students as “The Sims” (38 mentions), “Genshin Impact” (26 mentions), and “Minecraft” (25 mentions). Due to the large number of games named by the respondents, there is a need to categorize them. To divide games into genres we used the modern classification of Kirizleev, which is based on the actions that the player most often does in a video game [0]. According to the classification, the following genres were identified:

1. Information games (actions most frequently occurring in a video game - collecting and processing information) (185 mentions);
2. Action games (the actions most frequently encountered in a video game are movement and manipulation of objects) (188 references);

3. Control games (the actions most commonly found in a video game - where various thinking activities of players are involved, such as planning, controlling, managing) (96 mentions) (96 mentions);

4. “Time-killers” (mobile games in which it is impossible to identify the most frequent action, as they are most often based on only one repetitive action. For example, this group included clicker games, in which the only game action is clicking on the screen. The main purpose of these games is to spend free time) (88 mentions);

5. Traditional games (chess, sudoku, board games - which are “translated” into the format of electronic applications) (32 references).

The number of mentions of games of different genres was counted for each subject. One-factor analysis of variance with repeated measures (non-parametric variant - Friedman test) showed significant differences between the number of mentions of different game genres (see the figure). Pairwise comparisons by Wilcoxon test (with Bonferroni correction for multiple comparisons) revealed that the most frequently mentioned genres were action games and information games. The most rarely mentioned genres by respondents were “time-killers”. Consequently, respondents most often preferred to play video games that require the use of cognitive abilities (such as concentration, attention allocation, reaction speed, and so on) to manipulate objects and/or process information. It is also worth noting that no correlation was found between players' temperament characteristics and their preferences in game genres or specific video games.

Our second step was to analyze the emotions that respondents experience while playing the game. It is worth noting that the respondents were asked to choose an emotion from a suggested list. This list included the following emotions: joy, excitement, excitement, anger, happiness, surprise, interest, irritation, boredom, satisfaction, apprehension. Confirmatory factor analysis was used to process data on the degree of expression of specific emotions experienced by the subjects while playing video games. According to the results of the factor analysis, emotions are combined into 4 groups: positive emotions (joy, happiness), negative emotions (anger, irritation, apprehension, boredom), intellectual emotions (interest, surprise, satisfaction) and excitement (excitement, thrill). The model showed a good fit to the data ($\chi^2(35)=47.5$, $p=0.139$, CFI=0.957, RMSEA=0.043 (90% CI 0.00-0.077)).

Our next step was to conduct a correlation analysis to assess the relationships between video game genres and individual-psychological differences of the respondents, including individual indicators of their gaming activity obtained during the processing of the questionnaire of video game preferences and emotions experienced during the game (e.g., game duration, frequency of activation of serious efforts to stop the game, etc.). The following results were obtained:

1. There are no significant correlations between the frequency of mentioning a video game of a certain genre and temperament traits;

2. Frequency of mentioning information game has a significant positive correlation with intellectual emotions ($r=0.26$ at $p \leq 0.001$), positive emotions ($r=0.21$ at $p \leq 0.01$), time playing ($r=0.20$ at $p \leq 0.01$), and efforts to stop playing ($r=0.18$ at $p \leq 0.05$);

3. Control games have a significant negative relationship with experienced arousal during the game ($r=-0.24$ at $p \leq 0.01$).

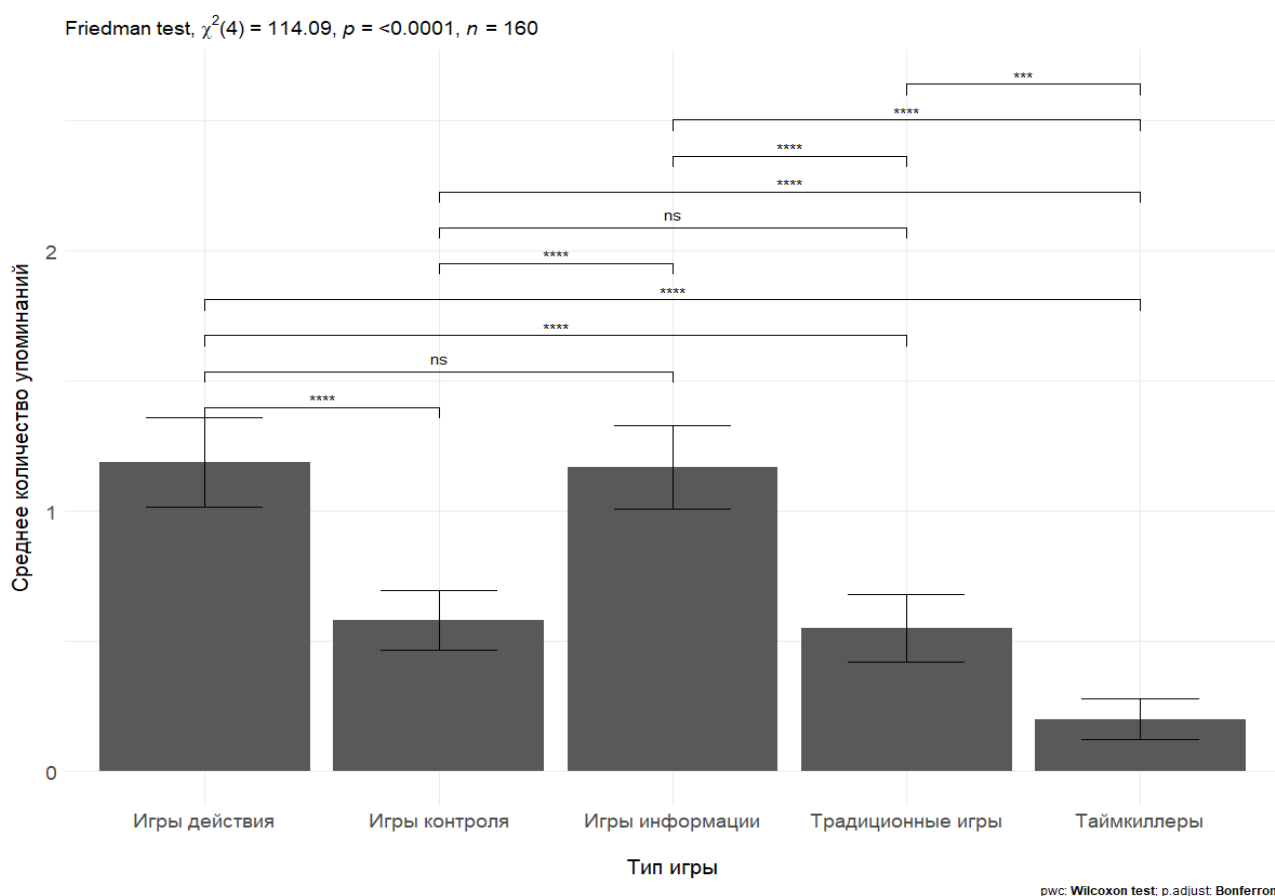


Fig. Comparative Analysis of the Popularity of Video Games of Different Genres (Kirizleev Classification, 2021).

Thus, we can conclude that the frequency of preference for the genre of video games is almost not related to individual-psychological differences, but is determined by other factors, which will be discussed further. It is also worth noting that information games are positively associated with activation of emotions (intellectual and positive) while negatively associated with efforts to stop playing, which in turn can lead to an increase in time spent playing and be a predictor of video game addiction. Information games were the only genre that showed a positive relationship with effort to stop playing.

Relying on the classification presented in the work of N. Yee [20], we divided video games according to the leading game mechanics of a video game. Game mechanics is a set of rules

and ways of player's interaction with the game world, i.e. these are the main game actions that the player performs [15]. It is also worth noting that in one video game there can be many game mechanics, so in this case we consider the main game mechanics (those actions to which the whole game is reduced). Thus, we have:

1. Achievement games (video games in which the “achievement” component is prevalent. The player needs to develop his character, improve his characteristics, improve his game result, and compete with other players) (297 mentions);

2. Social games (video games in which the “society” component prevails. The player needs to build relationships and interact with in-game characters and/or other players, most often playing with them in a team) (73 mentions);

3. Immersion games (video games in which the “immersion” component is prevalent. The player has to play a role, customize his character, and explore the in-game world) (219 mentions).

We also divided the games into two groups: violent games (games with violent actions) and non-aggressive games (games without violent actions). This division of games was carried out with the help of expert assessment of psychologists working in the field of research of video games and their influence on psychological characteristics. The expert psychologists had to analyze the gameplay of the video games named by the respondents and identify those video games whose gameplay contains violent actions of any intensity. Three expert psychologists participated in the study and discussed each game together in order to categorize it into one or another group. Thus, we found that out of 589 games named by the respondents, 261 were aggressive and 328 were non-aggressive.

Next, a correlation analysis was conducted to assess the relationship between the group data and the individual psychological differences of the respondents, including those obtained with the help of a questionnaire of video game preferences and emotions experienced during the game.

By conducting Pearson correlation analysis, we obtained the following results:

1. Achievement games have a significant direct correlation with the time spent playing ($r=0.28$ at $p\leq 0.001$);

2. Aggressive games have a significant direct relationship with time spent playing ($r=0.34$ at $p\leq 0.001$) and tendency to think (as a temperament trait) ($r=0.27$ at $p\leq 0.01$);

3. Immersion games have a significant direct relationship with positive emotions ($r=0.21$ at $p\leq 0.01$).

In connection with the above, we can conclude that the choice of video game genre is almost unrelated to individual-psychological differences, but some game mechanics contribute to the increase of time spent playing a video game (achievement games and aggressive orientation). It is also worth noting that the only temperament trait that showed an association with game mechanics was the tendency to think.

We also used Student's t-test, which showed that the propensity to think is higher in those who play aggressive-oriented games than in those who do not play them ($t=-3.35$ at

$p \leq 0.001$). This result may be explained by the fact that aggressive video games require the player to think through tactics and strategies and to orient quickly in a situation of uncertainty. It also showed that thinking stamina ($t = -2.96$ at $p \leq 0.01$) and empathy ($t = -2.68$ at $p \leq 0.01$) are higher in those who play immersion games than in those who do not play them. In turn, this may be explained by the fact that in immersion games players need to analyze a lot of information, including that related to their character's history.

Conclusions

The study focused on the relationship between video game characteristics and individual-psychological differences of students. The data were evaluated both on the total sample and with the division of respondents into groups depending on the video games they prefer to play. The results we obtained allow us to draw the following conclusions.

First, the most popular video game genres among students are information games and action games. These genres of video games require players to make quick decisions, including in situations of uncertainty, activation of cognitive functions and a certain degree of emotional immersion in the game process. The least popular genre is “time-killers”, i.e. video games with low cognitive and emotional load. Accordingly, we can conclude that students prefer video games that do not just allow them to spend their free time, but set cognitively challenging tasks for the player and evoke an emotional response (intellectual or positive).

Secondly, we found that there is no correlation between the preferred genre of video games and temperament traits, i.e. the preference for the genre of video games is determined by factors other than individual psychological traits. One such factor is game mechanics. We have shown that there are game mechanics that contribute to the increase of time spent playing (“achievement games” and aggressive games), which in turn can be a predictor of video game addiction.

Let us remind you that achievement games are games in which the “achievement” component is predominant, i.e., the player needs to constantly develop and/or compete with other players. We can assume that it is the ability to track one's development in the game, combined with the emotional excitement of the game, that contributes to the increase in time spent playing a video game.

Also, the only video game genre that has shown a relationship with effort to stop playing is information games. However, it is premature to conclude that this genre of video games is the most conducive to video game addiction, as this result may be related to the depth of immersion in the video game world and the intellectual and positive emotions experienced while playing.

The results obtained are, of course, intermediate in nature. However, we can already say that it is not the genre of the video game itself that has an impact, but the game mechanics that are embedded in the game. It is the game mechanics that show a connection with individual-psychological differences of respondents and determine the time spent playing the game.

The areas of further research could be a more in-depth study of video game mechanics. The multi-genre nature of modern video games is ensured by the inclusion of a wide variety of video game mechanics in the gameplay of a video game. The identification and study of specific video game mechanics opens up a wide range of possibilities not only for expert evaluation of video games, but also for assessing their impact on specific groups of players. It also seems to us that in the future we should focus on studying the short-term impact of video game mechanics on the emotional and cognitive state of respondents, which will allow us to obtain data, for example, on which video game mechanics facilitate the learning process, and which, on the contrary, hinder it.

Limitations of the Study

It is also worth noting the limitations of this study, which relate to the specifics of our sample. The study sample consists of first and second year students of MSUPE, and 87% of respondents are girls. In this regard, it is logical to assume that there may be gender specificity that affects the preference for video games with certain characteristics. Also, it cannot be overlooked that despite the fact that first and second year students participated in the study, there may be specificity related to individual-psychological differences of respondents entering to study to be a psychologist. Thus, we believe that the task of future research should be to specify the studied effects in the light of the study of gender differences and professional-educational characteristics of players in the relationship with their individual-psychological differences and video game characteristics.

Литература

1. Кирилеев А. Жанры компьютерных игр (общая схема) v.1.5 [Электронный ресурс] // GamesIsArt.ru. URL: <https://gamesisart.ru/TableJanr.html> (дата обращения: 27.02.2024).
2. Обзор исследований социальных взаимодействий с применением окулографического метода / Агеев Н.Я. [и др.] [Электронный ресурс] // Психолого-педагогические исследования. 2023. Том 15. № 2. С. 49–67. DOI:10.17759/psyedu.2023150204
3. Рубцова О.В., Саломатова О.В. Детская игра в условиях цифровой трансформации: культурно-исторический контекст (Часть 1) // Культурно-историческая психология. 2022. Том 18. № 3. С. 22–31. DOI:10.17759/chp.2022180303
4. Рубцова О.В., Саломатова О.В. Детская игра в условиях цифровой трансформации: культурно-исторический контекст (Часть 2) // Культурно-историческая психология. 2022. Том 18. № 4. С. 15–26. DOI:10.17759/chp.2022180402
5. Русалов В.М., Трофимова И.Н. О представленности типов психической деятельности в различных моделях темперамента // Психологический Журнал. 2011. Том 32. № 3. С. 74–84.
6. Связь цифровых технологий с развитием когнитивных и коммуникативных процессов подростков и юношей: обзор эмпирических исследований / Агеев Н.Я. [и др.]

- др.] // Психолого-педагогические исследования. 2023. Том 15. № 1. С. 37–55. DOI:10.17759/psyedu.2023150103
7. Стоп-игра?! Проблемы российского онлайн-гейминга [Электронный ресурс] // ВЦИОМ Аналитический обзор. 20 июля 2022. URL: <https://wciom.ru/analytical-reviews/analiticheskii-obzor/stopigra-problemy-rossiiskogo-onlain-geiminga> (дата обращения: 23.02.2024).
8. Aggression or Aggressiveness? A research hypothesis on aggression, videogames and executive functions in preschool age / Messina M. [et al.] // 9th IEEE International Conference on Cognitive Infocommunications (Budapest, Hungary 22 august 2018 y.). Budapest, 2018. DOI:10.1109/CogInfoCom.2018.8639880.
9. Anguera J., Gazzaley A. Video games, cognitive exercises, and the enhancement of cognitive abilities // Current Opinion in Behavioral Sciences. 2015. № 4. P. 160–165. DOI:10.1016/j.cobeha.2015.06.002
10. Dowsett A., Jackson M. The effect of violence and competition within video games on aggression // Computers in Human Behavior. 2019. Vol. 99. P. 22–27. DOI:10.1016/j.chb.2019.05.002.
11. Green C.S., Bavelier D. Effect of action video games on the spatial distribution of visuospatial attention // Journal of Experimental Psychology: Human Perception and Performance. 2006. Vol. 32. № 6. P. 1465–1478. DOI:10.1037/0096-1523.32.6.1465
12. Halbrook Y.J., O'Donnell A.T., Msetfi R.M. When and How Video Games Can Be Good: A Review of the Positive Effects of Video Games on Well-Being // Perspectives on psychological science: a journal of the Association for Psychological Science. 2019. № 14(6). P. 1096–1104. DOI:10.1177/1745691619863807
13. Hemenover S., Bowman N. Video games, emotion, and emotion regulation: expanding the scope // Annals of the International Communication Association. 2018. № 42. P. 125–143. DOI:10.1080/23808985.2018.1442239
14. Powers K.L., Brooks P.J. Evaluating the Specificity of Effects of Video Game Training // Learning by Playing: Video Gaming in Education / Ed. F.C. Blumberg. Oxford: Oxford University Press, 2014. P. 302–330. DOI:10.1093/acprof:osobl/9780199896646.003.0021
15. Sicart M.A. Defining game mechanics // Game Studies. 2008. Vol. 8. № 2. P. 1–14.
16. Stoet G. PsyToolkit: A software package for programming psychological experiments using Linux // Behavior Research Methods. 2010. Vol 42(4). P. 1096–1104.
17. Stoet G. PsyToolkit: A novel web-based method for running online questionnaires and reaction-time experiments // Teaching of Psychology. 2017. Vol. 44(1). P. 24–31.
18. Trofimova I., Sulis W. Is temperament activity-specific? Validation of the Structure of Temperament Questionnaire-Compact (STQ-77) // International Journal of Psychology and psychological therapy. 2011. № 11. P. 389–400.
19. Videogames for Emotion Regulation: A Systematic Review / Villani D. [et al.] // Games for Health Journal. 2018. № 7(2). P. 85–99. DOI:10.1089/g4h.2017.0108
20. Yee N. Motivations for Play in Online Games // Cyber Psychology & Behavior. 2006. №

9. P. 772–775.

References

1. Kirizleev A. Zhanry komp'yuternykh igr (obshchaya skhema) [Genres of computer games (general scheme)] v.1.5 [Elektronnyi resurs]. Available at: <https://gamesisart.ru/TableJanr.html> (Accessed: 27.02.2024). (In Russ.).
2. Obzor issledovaniy sotsial'nykh vzaimodeystviy s primeneniem okulograficheskogo metoda [A review of research on social interactions using the oculographic method] / Ageev N.Ya. [i dr.] [Elektronnyi resurs]. *Psikhologo-pedagogicheskie issledovaniya = Psychological-Educational Studies*, 2023. Vol. 15, no. 2, pp. 49–67. DOI: 10.17759/psyedu.2023150204 (In Russ.).
3. Rubtsova O.V., Salomatova O.V. Detskaya igra v usloviyakh tsifrovoi transformatsii: kul'turnoistoricheskii kontekst [Children's play in the context of digital transformation: cultural and historical context (Part 1)]. *Kul'turnoistoricheskaya psikhologiya = Cultural-Historical Psychology*, 2022. Vol. 18, no. 3, pp. 22–31. DOI:10.17759/chp.2022180303 (In Russ.).
4. Rubtsova O.V., Salomatova O.V. Detskaya igra v usloviyakh tsifrovoi transformatsii: kul'turnoistoricheskii kontekst [Children's play in the context of digital transformation: cultural and historical context (Part 2)]. *Kul'turnoistoricheskaya psikhologiya = Cultural-Historical Psychology*, 2022. Vol. 18, no. 4, pp. 15–26. DOI:10.17759/chp.2022180402 (In Russ.).
5. Rusalov V.M., Trofimova I.N. O predstavlenosti tipov psikhicheskoi deyatel'nosti v razlichnykh modelyakh temperamenta [On the representation of types of mental activity in various models of temperament]. *Psikhologicheskii Zhurnal [Psychological Journal]*, 2011. Vol. 32, no. 3, pp. 74–84. (In Russ.).
6. Svyaz' tsifrovyykh tekhnologii s razvitiem kognitivnykh i kommunikativnykh protsessov podrostkov i yunoshei: obzor empiricheskikh issledovaniy [The connection between digital technologies and the development of cognitive and communication processes in adolescents and young men: a review of empirical studies] / N.Ya.Ageev [i dr.]. *Psikhologopedagogicheskie issledovaniya = Psychological-Educational Studies*, 2023. Vol. 15, no. 1, pp. 37–55. DOI:10.17759/psyedu.2023150103 (In Russ.).
7. Stop-igra?! Problemy rossiiskogo onlain-geiminga. VTsIOM. Analiticheskii obzor [VTsIOM Analytical review]. 20 July 2022. Available at: <https://wciom.ru/analytical-reviews/analiticheskii-obzor/stopigra-problemy-rossiiskogo-onlain-geiminga> (Accessed: 23.02.2024). (In Russ.).
8. Aggression or Aggressiveness? A research hypothesis on aggression, videogames and executive functions in preschool age / Messina M. [et al.]. 9th IEEE International Conference on Cognitive Infocommunications, (Budapest, Hungary 22 August 2018 y.). Budapest, 2018. DOI: 10.1109/CogInfoCom.2018.8639880.

9. Anguera J., Gazzaley A. Video games, cognitive exercises, and the enhancement of cognitive abilities. *Current Opinion in Behavioral Sciences*, 2015, no. 4, pp. 160–165. DOI: 10.1016/j.cobeha.2015.06.002
10. Bors D. A., Stokes T. L. Raven's Advanced Progressive Matrices: Norms for first-year university students and the development of a short form. *Educational and Psychological Measurement*, 1998, no. 58(3), pp. 382–398. DOI: 10.1177/0013164498058003002
11. Dowsett, A., Jackson, M. The effect of violence and competition within video games on aggression. *Computers in Human Behavior*, 2019, Vol. 99, pp. 22–27. DOI: 10.1016/j.chb.2019.05.002.
12. Green C.S., Bavelier D. Effect of action video games on the spatial distribution of visuospatial attention. *Journal of Experimental Psychology: Human Perception and Performance*, 2006, Vol. 32, no. 6, pp. 1465–1478. DOI:10.1037/0096-1523.32.6.1465
13. Halbrook, Y. J., O'Donnell, A. T., Msetfi, R. M. When and How Video Games Can Be Good: A Review of the Positive Effects of Video Games on Well-Being. *Perspectives on psychological science: a journal of the Association for Psychological Science*, 2019. no. 14(6), pp. 1096–1104. DOI: 10.1177/1745691619863807
14. Hemenover S., Bowman N. Video games, emotion, and emotion regulation: expanding the scope. *Annals of the International Communication Association*, 2018. no. 42, pp. 125–143. DOI: 10.1080/23808985.2018.1442239
15. Powers K.L., Brooks P.J. Evaluating the Specificity of Effects of Video Game Training. In F.C. Blumberg (ed.), *Learning by Playing: Video Gaming in Education*. Oxford: Oxford University Press, 2014, pp. 302–330. DOI:10.1093/acprof:osobl/9780199896646.003.0021.
16. Sicart M.A. Defining game mechanics // *Game Studies*. 2008. Vol. 8, no. 2, pp. 1–14.
17. Trofimova I., Sulis W. Is temperament activity-specific? Validation of the Structure of Temperament Questionnaire-Compact (STQ-77). *International Journal of Psychology and psychological therapy*, 2011. no. 11, pp. 389–400.
18. Videogames for Emotion Regulation: A Systematic Review / Villani D. [et al.]. *Games for Health Journal*, 2018. no. 7(2), pp. 85–99. DOI: 10.1089/g4h.2017.0108
19. Yee N. Motivations for Play in Online Games. *Cyber Psychology & Behavior*, 2006, no. 9, pp. 772–775.

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