

Sex Differences in Media Use in 6–7-year-old Children

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This investigation aims to study the features of the use of digital devices by preschool children depending on sex. The results of an interview with 495 children (50% girls) aged 6-7 (M=63,6 months, SD=4,7 months) from Moscow kindergartens are presented. The interview contains questions about the frequency of digital devices use and about familiar and favorite digital leisure activities. The results of the study demonstrate that boys use digital devices more often than girls. Girls use digital devices in more varied ways than boys, using digital devices more often for drawing, communication and taking pictures. Boys are more likely than girls to have videogames as their favorite digital activity. The results suggest that girls, with the help of digital devices, are more likely to explore the space of culture, and their way of digital leisure time is more conducive to the self-regulation development. The conclusion from this result is that parents, educators, and psychologists should pay special attention to ensure that boys do not exceed the norms of screen time and get acquainted with the various possibilities of digital devices, in addition to games.

Keywords: preschool age; digital devices; cultural-historical approach; interviews; sex differences; screen time; self-regulation.

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Особенности использования цифровых устройств современными мальчиками и девочками 6-7 лет

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Данное исследование было направлено на изучение особенностей использования цифровых устройств дошкольниками в зависимости от пола. Представлены результаты интервьюирования 495 детей (50% девочек) в возрасте 6-7 лет ($M=63,6$ мес., $SD=4,7$ мес.) из детских садов города Москвы. Интервью содержало вопросы о частоте использования цифровых устройств, о привычных и любимых вариантах цифрового досуга. Показано, что мальчики пользуются цифровыми устройствами чаще, чем девочки. Девочки пользуются цифровыми устройствами более разнообразными способами, чем мальчики, чаще используют цифровые устройства для рисования, общения и создания фотографий. У мальчиков по сравнению с девочками чаще любимым цифровым занятием являются видеоигры. Полученные результаты дают возможность говорить о том, что девочки при помощи цифровых устройств в большей мере осваивают пространство культуры. Так, присущее девочкам менее частое по сравнению с мальчиками использование цифровых устройств и использование их в качестве культурных средств более благоприятно для развития саморегуляции. По результатам работы сделан вывод о том, что родителям, педагогам и психологам стоит уделять особое внимание тому, чтобы мальчики не превышали нормы экранного времени и знакомились с различными возможностями использования цифровых устройств помимо игр.

Ключевые слова: дошкольный возраст; цифровые устройства; культурно-исторический подход; интервью; половые различия; экранное время; саморегуляция.

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Introduction

The digital space is one of the important sources of socialization of modern children [2; 5]. While in early childhood digital activities are mainly carried out with the knowledge and under the control of parents, from the age of preschool children start using tablets, smartphones, computers, TV, or digital devices (hereinafter referred to as DD) independently. Most research has focused on how the use of DD is related to the cognitive and emotional and personal development of preschoolers. A particularly significant research topic is the study of how the use of DD is related to the development of self-regulation. After all, from the point of view of the cultural-historical approach, it is self-regulation that is the key indicator of mastering higher mental functions, i.e., is an indicator of mastering cultural tools. However, before we talk about the influence of DD on the development of preschoolers, it is important to study the content and specifics of their digital leisure time. At the moment, such characteristics of children's use of DD are poorly studied and are rarely the focus of researchers' attention [6]. Understanding the characteristics of DD use is necessary because it provides an opportunity for a differentiated analysis of the impact of these characteristics on the development of a child, which, accordingly, opens up the possibility to choose more favorable options of digital leisure activities for his/her development. For example, it has been shown that the frequency of DD use is inversely related to the level of development of most components of regulatory functions (auditory working memory, cognitive flexibility, and inhibitory control) in 6–7-year-old children [1]. In the same study, it is shown that children who use DD for communication have higher levels of cognitive flexibility and inhibitory control than children who do not use DD for communication [1].

When choosing an optimal strategy to develop for the use of DD, it is important to take into account the gender of preschoolers, because gender is a factor that can significantly influence the specifics of the child's use of DD [15]. A large number of studies have shown that from 3-4 years of age, boys already have more screen time and frequency of DD use than girls [9; 15; 18; 20; 22]. Gender differences in preferred types of digital leisure activities for preschoolers are practically not studied [15], while for adolescence this issue is actively considered - what particular qualities boys and girls have in choosing video games and in social networking behavior are often studied [15; 16; 21]. From the point of view of the cultural-historical approach, it is the contents of digital activities and content that is extremely important to study, because through them a child learns cultural norms. Within the cultural-historical approach, the role of parents in how children learn the digital space is of great importance. It can be assumed that the digital activities of preschool boys and girls differs significantly because, depending on gender, parents may choose different video games and cartoons for their children, may discuss with the child his or her digital experience in different ways, and may organize children's activities, other than digital activities, in different ways.

In the logic of the cultural-historical approach, which is the methodological basis of this work, DD can be considered as multidimensional means [3]. In L.S. Vygotsky's doctrine, cultural tools are psychological tools with the help of which a person makes an impact on someone else's or his/her own behavior. L.S. Vygotsky emphasized that the system of cultural tools is a fundamental factor determining the development of children: "The creation and use of artificial stimuli as auxiliary means for mastering one's own reactions and serves as the basis for that new form of determinability of behavior, which distinguishes higher behavior from elementary behavior" [3, p. 90]. Based on the idea of cultural tools, two types of DD use have been identified: DD as a cultural tool and DD as entertainment [19]. Examples of using DD as a cultural tool are communication, learning and creativity with the help of DD, the use of DD for orientation in space and time (navigator, timer, calendar, etc.), using DD for organizing one's own activities (notes, reminders, planner, etc.) [19]. In these cases, DD acts as a psychological tool for regulating one's own or others' behavior, which is a sign of the manifestation and development of arbitrariness [3]. The use of DD as a cultural tool implies the participation of an adult, without whom the child will not be able to learn and master culturally mediated ways of using DD. At the same time, the preschooler does not need an adult to master the second type of DD use, i.e., to understand how to use DD as entertainment, because the entertainment possibilities of DD are clear from the properties of these devices [18]. When a child uses the DD as an entertainment tool (for video games, watching cartoons and other video content), the only purpose of this activity is to get enjoyment, i.e., there is no direct development of arbitrariness and mastering of the cultural space. This typology of DD use is fundamentally new, so there is still little information on the gender differences in preschoolers' use of DD as a cultural tool and use of DD solely for entertainment.

Thus, the first research question of this paper is: are there differences between boys and girls in the regular and favorite kinds (e.g., communicating, playing video games, watching cartoons, drawing, learning with DD, etc.) and types (using DD only for entertainment and using DD as a cultural tool) of digital activities? The second research question is: are there differences between boys and girls in how often they use DD? Based on the results of other studies [9; 15; 18; 20; 22], a hypothesis can be made regarding the answer to the second question: boys probably use DD more often.

The novelty of this study is that information about children's use of DD was collected by interviewing the children themselves, whereas information is usually collected from the parents of preschoolers. Parents' responses are a less reliable source of information because, firstly, parents do not fully control preschoolers' digital leisure time. And secondly, parents may give socially desirable answers. In addition, children's digital leisure time is examined in the cultural-historical paradigm, from the position of comparing the use of DD as a cultural tool or as entertainment, which is also a new prism of analysis for this topic.

Methods

Sample. The study involved 495 children (50% girls) aged 6-7 years ($M=63.6$ months, $SD=4.7$ months), pupils of preparatory groups of municipal kindergartens in Moscow. The parents of 76% of children estimated the level of their family's wealth as average, 16% - above average, 8% - below average. The parents of 93% of children have a higher education.

Methods. To study the peculiarities of modern preschoolers' use of DD, a semi-structured interview with children about their use of DD was conducted. The following are the interview questions that will be discussed in this article:

1. How often do you use a computer, tablet, mobile phone?
2. What do you usually use the computer, tablet, mobile phone for?
3. What is your favorite thing to do on your tablet, phone, computer?

Study Procedure. Informed parental consent was obtained in advance for the children to participate in the study. Each child was interviewed individually, in a quiet room in the kindergarten. Usually, it was a bedroom or a psychologist's office. The interview was conducted by a trained professional. The interview questions were asked in the same order, with the same wording, but, if necessary, the specialist could ask clarifying questions and clarify something that the child did not understand.

The children's answers to the interview questions were recorded on a tape recorder, and then the audio recordings were transcribed. After that, the children's detailed answers to each question were categorized. For question No. 1 about the frequency of DD use, the following response categories were identified: "Every day", "Several times a day", "On the weekends", "Once a week", "Less than once a week". For questions No. 2 and No. 3 about types of activities with the help of DD, the following response categories were identified: "Video games", "Communication", "Watching cartoons", "Watching videos", "Searching for information on the Internet", "Listening to music", "Taking photos", "Viewing photos", "Education", "Orientation" (in time and space), "Drawing". Each child's response to the questions about the types of activities with the help of the DD was categorized into one of the three types identified in terms of differentiating the ways in which the DD were used as cultural tools or for entertainment. So, if a child gave answers only from the categories "Video games", "Watching cartoons", "Watching videos", then this type of DD use was labeled as "Using DD for entertainment only". If, on the contrary, the child named any other response categories other than these three, then his/her type of use was labeled as "Using DD only as a cultural tool". If a child named response categories belonging to both types, his/her response was labeled as "Using DD both as a cultural tool and for entertainment".

Results

The chi-square test was used to compare the frequency of boys' and girls' use of DD. It is shown that more boys than girls report that they use DD every day (see Table 1). At the same time, more girls report that they use the DD about every other day (see Table 1).

Table 1

Distribution of Children's Answers to the Interview Question "How Often Do You Use a Computer, Tablet, Mobile Phone?" (N=333)

	Boys, N=169	Girls, N=164	p-level
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Every day*	69,8%	50,6%	0,000
Several times a day*	16,6%	30,9%	0,003
On the weekends	5,9%	9,8%	0,192
Once a week	5,9%	7,3%	0,607
Less than once a week	1,8%	1,8%	0,970

Notes. * - statistically significant differences between groups, p-level \leq 0.05.

The chi-square test was also used to compare the ways of using DD by boys and girls. Answering the question about what they usually use DD for, more girls than boys said that they use DD as a cultural tool: for communication, photographing, drawing (Table 2). At the same time, boys more often use DD only for entertainment - for playing games and watching video content (Table 2). Thus, girls more often use DD in more diverse ways, including as cultural tool.

Table 2

Distribution of Children's Answers to the Interview Question "What Do You Usually Use a Computer, Tablet, Mobile Phone For?" (N=366)

	Boys, N=184	Girls, N=182	p-level
Video games	84,2%	76,4%	0,058
Communication*	18,5%	31,3%	0,004
Watching cartoons	27,7%	30,8%	0,521
Watching videos	13,6%	15,9%	0,527
Searching for information on the Internet	2,7%	3,8%	0,544
Listening to music	1,6%	1,6%	0,989
Taking photos*	3,8%	11,5%	0,005
Viewing photos	2,2%	3,8%	0,349
Education	9,8%	15,4%	0,106
Orientation (in time and space)	1,1%	1,6%	0,644
Drawing*	1,1%	5,5%	0,018
Using digital devices only as a cultural tool	6,5%	11,6%	0,091
Using digital devices both as a cultural tool and for entertainment*	25,5%	44,2%	0,000
Using digital devices for entertainment only*	67,9%	44,2%	0,000

Notes. * - statistically significant differences between groups, p-level \leq 0.05.

As shown using the chi-square test, answers to the question about a favorite digital activity also differed between boys and girls: boys more often named video games, girls - drawing with the help of DD (Table 3). In addition, overall, girls gave more frequent responses from the category "using digital devices only as a cultural tool" and boys gave more frequent responses from the category "using digital devices only for entertainment" (Table 3).

Table 3

Distribution of Children's Answers to the Interview Question "What is Your Most Favorite Activity Using a Computer, Tablet, Mobile Phone?" (N=366)

	Boys, N=184	Girls, N=182	p-level
Video games*	68,8%	53,8%	0,004
Communication	2,3%	5,5%	0,116
Watching cartoons	15,9%	21,4%	0,181
Watching videos	11,4%	10,4%	0,779
Searching for information on the Internet	0,6%	1,6%	0,331
Listening to music	0,6%	2,7%	0,108
Taking photos	2,3%	3,8%	0,388
Viewing photos	2,2%	3,8%	0,349
Education	5,1%	4,4%	0,749
Drawing*	4,0%	11,0%	0,012
Using digital devices only as a cultural tool*	11,9%	25,3%	0,001
Using digital devices both as a cultural tool and for entertainment	2,8%	3,8%	0,597
Using digital devices for entertainment only*	85,2%	70,9%	0,001

Notes. * - statistically significant differences between groups, p-level \leq 0.05.

Discussion of Results

The study aimed to explore the differences in boys' and girls' responses about how often they use DD and the types of digital activities they prefer. Also, the children's responses about the types of activities using DD were analyzed in terms of the typology of DD use - using DD as a cultural tool or for entertainment.

It was shown that boys use DD more often than girls. This result confirmed the initial assumption and data from other studies, which showed that boys have more screen time than girls [9; 15; 18; 20; 22]. This result can be explained by the characteristics of raising children depending on gender: parents more often offer girls alternative leisure activities unrelated to games and, in particular, to games in DD [15]. The study by Sowmya and Manjivani shows that the screen time of boys and girls does not differ on weekdays, but on weekends the screen time of boys is higher [20]. This result confirms the important role of parents: parents tend to spend time with their children on weekends, which means that they are the ones who determine the child's weekend routine, including the duration of screen time. In this study, it was shown that parents perceived girls' screen time to be easier to control than boys' screen time, and that boys were more likely to express negative emotional reactions when it was necessary to finish the use of DD [20]. It can be assumed that preschool boys spend more time with DD and react so strongly to the end of DD use, because at this age, boys' regulatory functions develop more slowly than girls' [7]. Perhaps because of this, it is easier for girls than boys

to switch to other activities from digital leisure time and comply with screen time limits. However, this assumption needs empirical verification.

The current study showed that girls are more likely to use DD for communication, taking pictures, and drawing. Girls are more likely than boys to cite drawing as their favorite digital activity, and boys are more likely to cite video games as their favorite digital activity. The overall trend is that girls are more likely than boys to use DD as a cultural tool, and boys are more likely than girls to see DD as entertainment only. This result is consistent with those works that show that the gender of the preschooler plays a role in how parents organize their child's leisure time [4; 12; 15]. According to a survey of 1936 parents of preschoolers, both fathers and mothers are more likely to play a variety of active games with their sons than with their daughters, and the opposite pattern is true for modeling, reading, and drawing [4]. In a survey of 1012 parents of children aged 3-5 years old, it is shown that parents are more supportive of daughters' reading than sons' reading and more often discuss reading with girls [12]. Thus, we can conclude that in the organization of digital leisure activities of preschool children by their parents the same gender-related trends as in other types of shared leisure activities is observed.

Due to longer screen time, boys are at risk of forming dependence on DD [8; 14]. Also, long screen time is a risk factor for problems with self-regulation [9; 10; 17], which is crucial for a child's readiness for school. Moreover, it has been shown that girls on average have an advantage over boys of the same age in school readiness - for example, girls on average have higher levels of self-regulation, literacy, and other pre-academic skills [6; 13]. This may be related, among other things, to the particular qualities of the organization of boys' and girls' leisure time. Thus, it is important for parents of preschoolers, and especially for parents of boys, to pay special attention to the fact that children master the cultural space and control screen time with the help of DD for optimal development of self-regulation in their children.

A limitation of this study is the lack of data on children's screen time. This study takes into account the frequency of DD use, but this parameter cannot fully reflect the time a child spends on digital leisure. The question about screen time was not asked as part of the interview because many children of 6-7 years old are not yet able to accurately estimate time in minutes. In the future, it is expected to obtain data on screen time from a survey of parents of the children interviewed. To consider other factors potentially influencing the development of regulatory functions is also a prospect for further research. In addition, it is worthwhile for further research to analyze how different parameters of digital device use are related to each other.

Conclusion

The conducted research allowed us to see the characteristics of the use of digital devices by modern boys and girls. It was shown that girls, compared to boys, are more active in mastering DD

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as cultural tools. Based on this result, it is suggested that the differences are determined by parents' perceptions or behavior towards children of different genders. Understanding the peculiarities of boys' and girls' use of DD will be useful for parents, educators, and psychologists. For example, in the case of preschool-age boys, particular care should be taken to ensure that screen time does not exceed what is recommended for that age, and that boys' digital leisure time consist not only of entertainment, but also of other opportunities to use DD - educational, cognitive, creative. For researchers, knowing the specifics of DD use depending on gender allows for a more accurate and versatile study of the effects of DD on children's cognitive and emotional and personal development in general, and on the development of self-regulation in particular.

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