

Child's Play in the Context of Digital Transformation: Cultural-Historical Perspective (Part One)

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The article is devoted to the peculiarities of preschoolers' play within the Information Society. It studies the types of technologies used by preschoolers in the process of play (video games, educational apps, smart and digital toys). It also provides an overview of the existing empirical research, proving that contemporary play represents a specific type of play activity, where physical and digital objects interact in real time. The article discusses different approaches to the analysis of digital play in the context of Cultural-Historical Theory (M. Fler, N.N. Veresov, N.E. Veraksa). It also focuses on the key differences between technical behaviors and digital play activity. The authors stress the need of transition transition from contrasting traditional play and play, mediated by technologies, to the analysis of digital play as a complex system of child-child and child-adult communities that construct the socio-cultural context of the child's everyday life.

Keywords: digital childhood, preschoolers, digital media, play activity, digital play, digital toys, digital content, technical behavior

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Детская игра в условиях цифровой трансформации: культурно-исторический контекст (Часть 1)

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Статья посвящена особенностям игровой деятельности дошкольников в условиях информационного общества. Рассматриваются основные виды технологий, используемых дошкольниками в процессе игровой деятельности (игровые и образовательные приложения, «умные» и «цифровые» игрушки). Приводится обзор эмпирических исследований, доказывающих, что современная игра представляет собой специфический тип игровой деятельности, при котором физические и цифровые объекты взаимодействуют в режиме реального времени. Обсуждаются подходы к анализу «цифровой игры» в рамках культурно-исторической традиции (М. Флир, Н.Н. Вересов, Н.Е. Веракса). Рассматриваются отличия «технического поведения» и собственно игровой деятельности с использованием

новых технологий. Обосновывается необходимость перехода от противопоставления «традиционной» игры и игры, опосредованной технологиями, к анализу «цифровой игры» как сложной системы детских и детско-взрослых взаимодействий, образующих социокультурный контекст жизни ребенка.

Ключевые слова: цифровое детство, дошкольники, информационные технологии, игровая деятельность, цифровая игра, цифровые игрушки, цифровой контент, техническое поведение.

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Introduction

Contemporary researchers often speak about a particular cultural-historical type of childhood – that is, *digital childhood*, which emerges within Information Society [8; 9; 16; 28]. The peculiarities of *digital childhood* are conditioned by the ubiquitous character of digital media [48], in which the boundaries between virtual and real modalities become extremely flexible, and in which physical and digital objects coexist and interact in real time [43]. In the context of the Cultural-Historical Theory, digital technologies may be regarded as a new means of mediating activity which combines both tool and sign components [4; 8; 9]. As with any new means of mediation, technologies change the existing types of social interactions and determine the development of higher mental functions and processes at different stages of human development. In this new social situation, researchers have noted qualitative changes in children's play activity [11; 12; 29]. On the one hand, play becomes more complex due to the use not only of traditional toys and plots, but also various gadgets and digital devices which provide access to virtual reality [41]. On the other hand, contemporary children seem less often to be involved in developed forms of play (particularly role playing), and the level of play skills seems to be relatively low during the preschool period [12; 14]. Considering the significance of play for the development of preschoolers' new formation, studying how the observed changes influence various aspects of contemporary children's development is an important challenge for contemporary psychology and education.

The purpose of this article is to identify the peculiarities of preschoolers' play in the context of digital transformation and to evaluate possible approaches to the analysis of such play as a new socio-cultural phenomenon.

Play and toys: how do digital natives play?

Today, all over the world, the age at which children become acquainted with digital media is dropping, while their daily consumption of media is increasing [20; 21; 45; 46]. In many countries, digital devices developed specifically for children (Internet of toys, books, and games with VR, etc.) keep gaining popularity, while in Russia, the majority of preschoolers use their parents' devices: smartphones, tablets and computers, which, to a large extent, determines the digital content to which they have access [15]. Russian preschoolers most often use educational apps and video games.

Educational programs for preschoolers occupy an intermediary position between learning and play content. Usually, these programs require that the preschooler completes certain tasks, causing a character within the program to praise the child. The aim of this kind of app is to get the child acquainted with letters, numbers, colors, etc., through play. This category can also include programs in which the child is trained in logical and spatial thinking, visual memory, and attention. This type of digital content also includes puzzles and programs that lead the child to form a picture from different parts. The category can also include programs aimed at the development of creativity (the most popular apps of this type focus on drawing and coloring).

Digital content designed for preschoolers is very diverse, as are the approaches to its classification. Usually, genres of play are identified according to:

- the content of the play task (puzzle-game, gambling, sports games, martial arts, etc.) [18];
- the skills used in the game (action, strategy, etc.) [22];
- the presence of plots and rules (game-exercise; game with rules; game with a plot) [7].

In our view, the psychological categorization of video games suggested by E. O. Smirnova and R.E. Radaeva is

particularly interesting. It is based on the character of role behavior, as per the position of the player in relation to the play situation, and includes the following types of video games: 1) puzzle-game and traditional games on a computer; 2) arcade games – a play genre in which the player manages a character to overcome different obstacles (this kind of games usually has various levels, with each level becoming more difficult or requiring greater speed); 3) strategies – games, in which the player has a bird's-eye-view on the play activity, allowing them to manage the process; 4) simulators – games allowing the player to be personally included in the play situation (first-person games); 5) narrative games – games with a constantly developing plot, reminiscent of cartoons or films [13].

In the last few years, the so-called *virtual play worlds*, designed for children, have become widespread. These play worlds are developed either as independent virtual platforms, or as supplementary platforms for existing toys (Barbie, Lego, etc.). Such programs allow one to create a personal play world within a virtual space, develop unique characters and play plots [41].

Apart from the various apps and programs for preschoolers, toys with digital elements, which include both material and electronic components, have recently gained in popularity. Usually, these toys can be managed from a computer or smartphone. Digital toys contribute to bilateral interaction, which means that they can suggest a task and then praise the child or answer a question addressed to them [6; 35]. In Russia, digital toys are not as popular as in Europe, Japan, or the United States [15].

One of the most well-known classifications of digital toys, proposed by L. Hall et al., divides them into three categories: *interactive, smart, and connected*. This classification is based on the following criteria: 1) the level of sophistication and complexity of the technology supporting interactivity; 2) toy agency, or the degree to which the toy appears to be proactive or autonomous; 3) the interactions being offered by the toy [30]. *Interactive toys* usually do not require an Internet connection; interaction with them is limited to a given set of functions (and therefore the actions of such toys are predictable). This type of toy supports traditional play including role-play or outdoor play for young preschoolers. *Smart toys* involve the use of more complex technologies (including an Internet connection), which allow the toy to maintain a conversation and recognize the interlocutor. Interaction with this type of toy is aimed at the development and education of the child. Therefore, such toys are designed primarily for senior preschoolers. *Connected toys* represent the most complex type of digital toys, which, thanks to various technological solutions (connection to

IoT, voice commands, etc.), can analyze previous interactions and adapt the content for the user, making the interaction as personalized as possible. There are also digital toys that can combine the features of several of the above categories.

Several authors distinguish between *smart* and *digital toys*, denoting that the main difference is the purpose of these toys. That is, if a toy provides sound or light signals and is designed primarily for the child's entertainment, this is a *digital toy* [35]. One common type of digital toy is the so-called *prototypical toy*. These are non-complex digital devices, which are not tied to particular play actions but rather give the child space for creativity (e.g., a Moff bracelet with a smartphone app).

Smart toys can demonstrate more complex behavior. They are ascribed a personality and demonstrate character. They can adapt to the needs of each family member. They can initiate and support communication, pick up on natural signals and react to people's emotions. One common type of smart toy is represented by animal robots, which closely mimic the habits of domestic animals (e.g., the dog AIBO, the dinosaur Pleo, etc.). Such toys are also called *social robots* [19].

Generally speaking, the accessibility and diversity of digital content designed for preschoolers leads to the permanent interrelation of the elements of traditional play and play mediated by technology. As a result, the borders between these two types of play become very flexible. Children transfer traditional play plots into the virtual space, filling them with new content, and vice versa – they incorporate digital characters into non-mediated play interactions. Under these conditions, a new specific type of play activity emerges, which requires both empirical and theoretical consideration.

Empirical research on digitally mediated play

Contemporary researchers who study digitally mediated play usually focus on the following:

- the peculiarities of play activity mediated by various technologies (gadgets, digital toys, computer programs, and apps);
- comparative studies of play with digital and traditional toys;
- the influence of the frequency and type of the child's interaction with digital media on the development of cognitive processes.

In the first area of focus, as noted, researchers are interested in the interaction of children with different types of computer programs and apps [38]. Some researchers study preschoolers' interaction with digital

toys and VR toys in detail. The aim of this kind of study is usually to determine the educational potential of these technologies [41]. In the framework of such research, the peculiarities of children's interactions within digital play are also studied [23].

On the whole, research, conducted in this first area of focus shows that preschoolers interact differently with each type of digital content. This can be clearly seen in their interaction with different types of apps. E.g., a study conducted by C. Moore shows that the type of app influences not only how the child interacts with a device but also how children interact with each other. If preschoolers are playing close to each other, using apps of a similar type, each of them on their own tablet, they usually communicate rather actively. This shows that the children are actually in a *joint* play situation, which is created for them by the app, and they are actively discussing it, although each child is playing on their own device, entirely independently of the others [44].

Research by S. Kjällander and F. Moinian demonstrates that children have the tendency to transform apps according to their desires. In a digital space, preschoolers can create or rename objects and actions, as well as change the functional meaning thereof. This study has unequivocally established children's capacity to do so [34].

The second area of focus is that on children's play with traditional and digital toys. An example of this type of research is the work conducted in the US under the guidance of P. H. Kahn. The goal of this work consisted in comparing children's interaction with AIBO, a robotic dog, and that with a stuffed dog. A preliminary interview with each child provided no meaningful differences in their relationships with the robot dog and the stuffed dog. However, in the process of play, qualitative differences in the interaction with AIBO and the stuffed dog were revealed. Children tried to animate the stuffed dog using verbal means, moving the toy, or trying to feed it. Children were more likely to hug the stuffed dog in comparison with the robot dog. They were also some cases of aggression towards the stuffed dog. As far as the robot dog is concerned, most children tended to demonstrate attention toward it mainly when AIBO initiated action [33].

A comparative study of children's interaction with AIBO and a living dog are of particular interest. According to the empirical data, the robot dog interested the children first as an object for experimentation. The children were particularly interested in how AIBO plays

with a ball. Therefore, they played with the robot and a ball more often than with the stuffed dog. While interacting with the stuffed dog, children demonstrated care. They caressed the stuffed dog and demonstrated social touch. The interview showed that, according to the children, AIBO had biological, psychological, social, and moral characteristics, but to a lesser degree than the stuffed dog [42].

The third area of focus is that which explores the influence of interaction with devices on a preschooler's cognitive development. Most often, these research works focus on such aspects as screen time (computer activity or online activity) and/or the genre of the digital content consumed by the preschoolers and the connection thereof with the development of attention, memory, speech, and social skills [2]. The results of this kind of research are very controversial. Thus, when spending too much time¹ at the screen, preschoolers often demonstrate such negative phenomena as weight gain, aggression, poor sleep quality, decreased attention span, poor vocabulary, low quality of traditional play activity, and difficulties in social interactions [1; 10; 36]. At the same time, when children stick to the recommended norms of screen time, many authors point to the positive influence that interaction with digital content has on perception, cognitive activity, visual-figurative and logical thinking, and working memory [2; 5; 17; 26; 39; 45].

On the whole, there has recently been a decline in the number of works devoted to the contraposition of the so-called "traditional play" and play mediated by technology. Given the constant interaction of children with various media, researchers increasingly turn to mixed forms of play activity, to study the transitions between virtual and physical play interactions. Findings show that this kind of play activity should be considered as an independent type of play, which requires specific research methods. This challenge has implications for the elaboration of the theoretical concept of *digital play*.

Digital play in the light of the Cultural-Historical Concept

Different terms are used to denote play activity that is mediated by technology. S. Edwards uses the concept of *converged play* where traditional play activity with toys is combined with new forms of mediated play [25]. A few authors use the concept of *connected play*, empha-

¹ Norms of screen time for preschoolers are based on guidelines from the American Academy of Pediatrics (2016) and the Canadian Pediatric Society (2017). According to the guidelines, screen time is not recommended for children under 2 years of age, while acceptable screen time for children aged 2-5 years is up to 1 hour a day [45; 47].

sizing the connections between the online and offline modalities in which the play process takes place [32; 40]. The term *digital play* is often used, however the interpretation of this concept differs greatly depending on the scientific school [27; 31; 37].

One of the most well-known authors elaborating on the concept of *digital play* in the framework of the Cultural-Historical scientific tradition is M. Fleer. Based on the ideas of L. S. Vygotsky, M. Fleer determines *digital play* to be “the creation of an imaginary digital situation, supported through a specialized form of digital talk where the themes of the play are drawn from children’s everyday experience” [27, p. 87]. According to the author, the key characteristics of *digital play* are [27]:

1) *technical behavior* – the process by which children experiment with digital media through clicking, swiping, and other technical aspects of using the app; this kind of interaction is not regarded as play per se, because no imaginary situation is involved;

2) *imaginary digital situation* – the digitally stimulated roleplay interactions that create the context for imaginary play;

3) *digital talk in imaginary digital situations* – a form of metacommunicative language that children use in the process of play interactions; this means of communication is used both when a few children are playing on one device, and when children are playing on the same app but on their own devices, and discussing the plot;

4) *giving a new sense to digital objects and actions in imaginary digital situations* – making, renaming and/or modifying icons/text symbols to create imaginary situations, giving a new sense to the digital situation;

5) *porous boundaries between digital play and social pretend play situations* – the transition of characters, objects, and plots, created by children in digital space, into traditional play and vice versa.

According to K. Dýrfjörð, M. Fleer’s characteristics of *digital play* can also be regarded as stages through which the child passes while getting acquainted with digital technologies [24].

From our point of view, M. Fleer has contributed much to the understanding of *digital play* and its developmental potential, primarily by pointing out the differentiated character of play activity mediated by technologies. *Digital play* includes, but is not limited to, technical behaviors, that is, experimenting with new apps or digital toys. This type of interaction with media occupies an important place in a contemporary child’s activities. However, it is not play in the strict sense of the word. The child needs to experiment in order to get acquainted with technology, which they can later use in more complex forms of play activity. M. Fleer considers a criterion

for the development of *digital play* to be an “imaginary digital situation”, which she interprets in a rather different way than Vygotsky did. However, it seems that the author is not aware of these differences. M. Fleer argues that the developmental potential of *digital play* is determined by the child’s participation in imaginary digital situations with the opportunity of developing the plot, changing the characters, roles, settings etc., and creating new digital situations. It is important that, in both cases, rules are required [27]. Despite the fact that the interpretation of the term “imaginary situation” in play requires further elaboration, M. Fleer’s concept allows *digital play* to be considered a complex form of joint activity between children and adults, which is incorporated into the general social context of the child’s life.

An interesting critique of the attempts to use traditional play theories (including the Cultural-Historical Concept) to the analysis of *digital play*, is presented in the works by J. Marsh. She finds that traditional play theories are human-oriented, and, therefore, they can be successfully used for studying speech and the social and cognitive aspects of play behavior. However, in her view, they cannot answer questions regarding the specifics of a child’s interaction with technologies in the process of play. Using the ideas of post-humanism, the author elaborates the concept of *connected play*, where both physical and digital objects are regarded as possessing *agency*. Marsh considers post-humanism to be a concept which is more productive for the analysis of contemporary child’s play, since the latter has very flexible boundaries between online and offline modalities and possesses absolutely different time and space characteristics [40].

From our point of view, the perspectives of applying the Cultural-Historical Concept for the analysis of digital play, are, first of all, connected with the possibility of interpreting technology as a new means of mediation, which combines tool and sign components [8; 9].

An interesting approach to the analysis of play mediated by technologies is presented in the works of N.N. Veresov and N.E. Veraksa. The authors point out the necessity of differentiating between a *digital game* and *digital play*. Although both terms are translated into Russian as *цифровая игра* [*tsifrovaya igra*], they have different meanings. *Digital play* denotes a play activity per se, as a system of rules, plots and play actions, while the term *digital game* refers to software, material and/or a virtual feeling, which presupposes goals and tasks, stages, characters etc. According to N.N. Veresov and N.E. Veraksa, *digital play* possesses the same characteristics as traditional play, and can be assessed based on such criteria as an imaginary situation, rules, roles and play actions. Apart from that, for the analysis of play ac-

tivity, the authors introduce the concept of a *normative situation*, which is understood as a constellation of factors, conditions, and circumstances in relation to which society prescribes the subject certain actions (norms of behavior) [3].

Traditional play consists of typical normative situations. According to the system of normative situations, typical of particular plots and roles, children regulate their play actions and create an imaginary situation. The more diverse that the normative situations (and, consequently, the play activities that the play provides) are, the more they contribute to the development of the child. Thus, according to the authors, the developmental potential of *digital play* can be assessed based on the following criteria: 1) the extent to which its content contributes to the collective creation and the development of imaginary situations; 2) how its content facilitates and enriches interactions between players during digital play; 3) its cultural normative situations and how these are represented in the play content [47, p. 9].

In turn, a *digital game* can be assessed according to the following aspects: 1) the play roles it offers and what rules apply to these roles; 2) how taking on roles can help develop and enrich the interactions between participants during digital play; 3) how the rules of play represent cultural normative situations and what forms of player interaction are made possible by following these rules [47, p. 10].

The ideas of N.N. Veresov and N.E. Veraksa are very interesting for the analysis of the developmental potential of different types of play apps and toys, as for assessing the development of *digital play* in preschoolers.

In summary, we see that there are not many authors who turn to the problem of *digital play* in the framework of the Cultural-Historical Scientific School. At the same time, it is Vygotsky's theory that allows us to study this type of play activity as an integral part of the contemporary socio-cultural context, and provides perspectives for organizing *digital play* as a system of developing child-child and child-adult interactions.

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Some concluding remarks

The presented analysis shows that contemporary children's play may be described in terms of *mixed reality*, which is characterized by the intersection of real and virtual modalities. The interaction of physical and digital objects, which takes place in the play process, represents a specific type of play activity, *digital play*, which requires empirical research as well as further theoretical reconsideration.

To understand the phenomenon of *digital play*, differentiation between “technical” and play behaviors is very important. Many authors regard *digital play* as a less developed, maybe even “worse” form of play, seeing play actions in this kind of play as limited to experimenting with a computer app or a *digital toy*. In fact, experimenting represents only one of the possible forms of interaction with digital content. It is important to highlight that the character of play interactions mediated by technology depends on the broader context in which a play activity takes place (e.g., where and with whom the child is playing, whether the parent is close to the child and whether they are taking part in the play, etc). From this point of view, *digital play* is little different from traditional play, since for the development of both types of play, specific conditions need to be created, and these conditions are connected with the organization of child-adult communities and joint means of interaction between the two. Thus, it is no wonder that, in the past few years, there has been a decrease in research works focusing on the opposition of traditional and *digital play*. At the same time, researchers have increasingly focused on the novel play practices in which children and adults are involved. Thus, the *digital play* research focuses on the necessity of classifying the categories thereof, considering them in relation to the traditional forms of play activity, and further elaborating on recommendations for organizing the interactions that emerge in specific types of child-adult communities which are mediated by digital technologies.

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