

# Preschoolers as Video Gamers

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**Abstract.** The results of a qualitative study of preschool-aged (five and six year old) gamers are presented. Videogames salespeople, parents, caregivers and teachers were surveyed; participating children (N=91) were observed; their behavioral patterns were registered. Adults express either concern or neutral attitudes towards playing video games; few of them are aware of positive and negative aspects, while the others pay little or no attention to the gaming practice. The observation shows that children are in varying degrees dependent on the adults' support. Preschoolers play educational and entertaining video games: they are interested in both achievements and cognition, react in an animistic manner towards computers and characters in the games. Their problems in comprehending the rules and instructions often result in failures. Gender specifics and age differences are also discussed.

**Keywords:** video games, preschool-aged players, qualitative study, psychology.

## 1 Introduction

Playing video games is a new practice in the development of preschoolers in Russia. Available video games include those for entertainment and/or educational purposes and are either adapted versions of games produced outside of Russia, or games developed by Russian producers. These games are age-specific. The majority of Russian preschool teachers, parents and caregivers have very limited experience in video gaming and can provide limited or no support to the children under their care. Children of five to six years old who play these games are the only age group that is numerous enough and at the same time wholly dependent on their elders (parents, caregivers and teachers). Although younger children are not any less dependent on their elders, gamers who are younger than five years old are less numerous. Older (school age) gamers are quite numerous, but at the same time are able to gain competence with little or no support from adults. Moreover, by virtue of their increased interaction with their peers and older children, they are much less dependent on their elders.

This study of gamers was done with Russian children, ages five and six. Because Russian children do not go to school until they are seven, the members of the investigated group can be considered preschoolers. That is to say, not many of them are able to read. As a result, video game rules and instructions need to be conveyed in

an auditory form. To attract the target group, video games need to be rich in color and graphic design. In fact, popular video games produced for preschoolers have to be quintessentially audiovisual.

This paper presents an explorative study held in 2008, with conclusions made in 2009. To get data for (longitudinal) comparison, it would be useful to carry on an additional study using the same methodology.

## 2 Preschool Gaming as a Research Problem

Previous studies related to video-gaming habits focus primarily on school-aged children, older teenagers being the largest group observed. While there are some studies related to the use of information technologies (gadgets, computers, game consoles, etc.) by preschool and elementary school aged children, these studies have been done outside of Russia, e.g., a key study outside of Russia was done by Turkle [2]. This study was a groundbreaking study in the late 1970s and early 1980s, i.e. the time when the first generation of preschool-aged children first began to access computers and electronic gadgets in kindergarten and at home. After this pioneering work, nobody carried it out again, although almost all other countries (other than the USA) and many communities were to introduce the access to new technologies to the first generations of children brought up within these countries and communities. This means that the study described in the landmark book “The Second Self” [2] is not only unique, but also unrivaled due to the lack of an adequate counterpart world-wide. Following the above mentioned book, many studies have been done within psychology, education and computer science. These studies refer to the actual processes of the use of computers by young children, including parameters of video gaming, online gaming and the use of consoles.

Attempts to organize an irregular and exemplary access of Russian preschoolers to computer technologies started in 1980s, when several enthusiasts established an Association called “Computer and Childhood”. The major activities of this Association were concentrated on the development of educational software, and on organization of classes with this educational software on conveniently located mainframe computers (kindergartens did not have computers at that time), so that children in kindergartens could get an access to them. Later the software was reformatted to be used on desktop computers and laptops. As for the software developed by this Association, it is quite rarely used nowadays due to the fact that PCs became widely available, and new sorts of commercial games became available as well.

The newest generations of games for preschool-aged children have a strong entertaining effect and well-developed graphic design; they are rich in colors and often correspond to popular fairy-tales (both related to Russian folklore and to world-famous fairytales) and/or popular animated movies. The commercial video games can be easily purchased and exchanged, and indeed children and/or their parents/caregivers often exchange games. The games are produced by a variety of software companies – the producers either adapt video games produced abroad or

produce original products. The variety of newer and older video games on the Russian market is rather wide; diverse types of games are easily available.

The variety of video games for preschool-aged gamers changes rapidly: the population of gamers is increasing, and psychological patterns of the gaming processes vary as well. Although the “Computer and Childhood” Association as well as some independent researchers make efforts to study the ways the preschool-aged children play video games [1], the results of these studies have not been updated. Thus, there is no adequate up-to-date information about the most current trends in the use of video games by those children who do not yet go to elementary school. The results of a qualitative pioneer study aimed at investigating current data on the theme are described in this paper.

The purpose of the study was to reveal what types of video games are popular within the target group, i.e. five and six-year-old preschoolers; to learn the attitudes – presumably, positive, neutral or negative – of adults (parents, caregivers and teachers) toward the processes of gaming; the likeability of situations in which adults give support to playing children and/or play with them, and to describe some typical playing patterns characteristic for preschool-aged video gamers. The patterns that were being investigated include typical emotional, behavioral and motivational reactions of the target group children.

### 3 Methods

The current study is qualitative and is approached thorough descriptions of the major parameters reported by parents, caregivers and teachers and fixed by the researcher and his assistants as relevant to the processes of preschool-aged children’s playing video games. The parameters are described in this section.

The study was carried out in four geographical regions in Russia: (1) in Moscow which has an outstanding position in the country, taking into account the number of citizens who have a high level of education and are economically well-to-do; (2) in a small town in the Moscow region; (3) in Chelyabinsk, which is a large industrial city in the Urals, on the border between the European and Asian territories; (4) in Saransk, which is a less populated and less prosperous industrial town in the centre of the European part of Russia.

As many as 91 preschool children participated in the study (31 from Moscow, 34 from Moscow region, 13 from Chelyabinsk and 11 from Saransk), including 43 boys and 48 girls. Each participant played at least two different games: one habitual and one previously unknown to him or her. The observation and registration sessions were performed both at home and at kindergartens; in the latter case, as many as 3-6 children were playing simultaneously; participant used his or her computer, but only one of them was the participant whose behavior was registered during the game session. In 14 gaming sessions, parents or caregivers were sitting next to the children to help them gain experience with a new game; research assistants kept a register of each child’s behavior and took notes with respect to the modes of child-adult interaction and collaboration.

The participants' computer literacy varied. Nevertheless, all of them were capable of the simplest forms of managing computers and operating computer or console games. The participants' experience in playing video games was no less than six months; some children had up to two years of experience in video gaming. The number of parents, caregivers and teachers who were surveyed was 52, from all of the abovementioned geographic regions. The number of the retailers and salespeople who replied to the questions is not specified; generalized reports were provided by local research assistants.

The methodology included a survey – oral (local retailers and video game salespeople were asked to estimate which games were in highest demand) and paper & pencil (parents, caregivers and teachers filled in a specially developed survey form), as well as an observation and registration of behavioral patterns of five and six year olds who played video games; besides, some of the observed children were presented with questions. The observation and survey were performed by four local research assistants, one from each of the geographical regions. The observation was done using a special registration sheet which was developed and tested in a pre-study session.

The pre-study was performed in Moscow exclusively and included consultations with two parents and two teachers, as well as observation and registration of gaming behavior of four five-year-old and four six-year-old children (five girls and three boys). Retailers and salespeople of video games were asked to orally respond as to which preschoolers' games were most often bought in each of the abovementioned geographic regions.

The registration sheet included such parameters as activity/passivity of the participant during the playing session, his or her interest towards the process of playing and its result (i.e., towards a success), attitudes towards losing or winning, readiness and/or eagerness to continue a playing session beyond the time allocated for gaming, peculiarities in the comprehension of the rules of a previously unknown game, the ability to invent correct or partly incorrect rules while playing, fantasy in inventing such rules, the level of absorption and immersion into the gaming process, readiness to ask for support and/or advice from an adult and to use this support/advice, parameters of interactions between a child and an adult, attempts to initiate interaction with a video game environment, types of emotional reactions of the children during the gaming sessions. To learn the intensity of behavioral reactions, the registration sheet was divided into sections corresponding to ten-minute intervals; the duration of sessions varied, but never exceeded forty minutes.

## **4 Results and Discussion**

Nine popular games were selected; all of these games were available at every geographical location under investigation. The selection was based on the results of surveys and interactions with game retailers/salespeople and parents/caregivers/teachers. Two of the games are educational, two are based on internationally well-known fairy-tales, two games are produced for entertainment, and three of them are based off of well-known animation movies. Thus, the local research assistants were able to register the study participants who played any two of the nine selected games:

first a familiar game, which the child had played more than once, and second, a new, unfamiliar game. Playing the familiar game was necessary, so that the child would get accustomed to the presence of a research assistant; the rest of the results refer to the reports on playing the second, i.e. previously unknown game. When asked, all the children replied they were fond of the games which were introduced to them, even in cases when the children had very little success while playing.

First, we will discuss the results of questioning the adults (parents, caregivers and teachers) who were supposed to report their views in written form and who were partly surveyed orally. The adults' (parents, caregivers and teachers) registered reports read as follows: the *advantages* of preschoolers playing video games include gaining competence in the use of computers, being more prepared to acquire cognitive habits and use them efficiently even before going to school, training rapid and effective reactions to screen events, bettering processes of psychological attention and building up logical ways of thinking. Many parents and caregivers (over half of the surveyed) reported that the permission to use the computers is a means of managing and controlling their children (an appraisal for 'good' behavior and a mild punishment in case of disobedience). The teachers reject this way of control, insisting that a computer is an educational medium and has nothing to do with disciplinary demands. Moreover, teachers claim that the use of computers should not be a means of manipulation for either children who might acquire habits characteristic of experienced manipulators, or for adults. Neither parents nor caregivers talked about – and supposedly even had such an idea – of manipulation.

The *negative* effects reported by adults are as follows: the parents and caregivers reported concern; firstly, that the visual psycho-physiological functions of their children might be damaged, and secondly, that children might get addicted to Internet gaming. Thirdly, they reported that the after-effects of gaming sessions on their children included nervousness, uneasiness and disobedience, and in the long run – loss of many of their other interests, such as painting or reading books (those children who had previously acquired reading capabilities), or playing with siblings, older brothers and sisters, with friends and neighbors of their age.

The parents' and caregivers' reports show that over half of them are little or not aware of the content and educational/entertaining characteristics of the games they buy and allow their children to play. The parents and caregivers tend to say that one of the major results of video gaming is that children's train to amuse themselves independently of the adults' control and special efforts. About one fourth of the parents and caregivers and all the teachers report they provide support to the preschool-aged gamers by following the process of playing when a new game is being introduced. Otherwise, they believe, the children may have difficulties in understanding instructions of how to play an unknown game, express nervousness and other negative reactions including crying, refusals to play particular games and calling them – as it did indeed happen more than once, according to the adults' reports – "uninteresting", "dull", "stupid", "incorrect", "fake", "incomprehensible", or "for adults".

More than one in every five adults (parents or caregivers) provided no reply to the question which asked whether he or she was aware of the type of the games his or her child is playing. When randomly asked in oral form, they would typically tell that the

other parent is responsible for the choice of video games and for giving the child support in gaming; this separation of roles in families makes it possible for them to express no interest at all in videogaming practices of their children.

Some parents and caregivers did not fill out the survey form carefully, limiting themselves to brief notes and said that their children were "OK", since they showed no symptoms of either Internet addiction, or other negative after-effects of video gaming. When incapable of formulating positive results of video gaming, the parents and caregivers consider the results either neutral or negative. Marking no signs of visible negative effects, they refuse to provide any further information due to their belief that video games are neutral to the psychological development of their children.

No regional differences in replies of parents, caregivers and teachers from the four locations have been revealed, probably due to the fact that the majority of respondents were from Moscow and the Moscow region.

Now we turn to the results of the registered behavior of the participating children. Observation and registration of behavior of children show two major types of motivation: first, to *achieve success*, and the second to be ready to *learn* new information items. Thus, the major drives were achievements and cognition. Not surprisingly, the former corresponds to the entertaining video games and in a lesser degree to the games related to the animated movies. About thirty per cent of the participating children nevertheless show a vivid tendency to express cognitive interests while playing entertaining video games. Cognitive interests correspond mostly to the problems they face in the process of playing, and sometimes to the contents of the video games. In the both cases the cognitive interest is usually not very deep and does not last long.

When they get tired, the participating children tend to lose concentration, express less interest in their achievements, fail to comprehend even the most simple instructions (although it is registered that before getting tired, they were fully aware of these instructions) and the adults' support messages, preferring sometimes that the adults perform all the actions so that the game session could be finished and the winning result gained.

Emotional reactions of the participating children can be characterized as follows: they show *arousal* and *impatience* during the whole gaming session; at the end of the sessions they tend to express even more arousal, asking the adults to let them go on playing until they win, and quite often – even after they have won. The children now and then shout out loudly, often cry if they do not get permission to go on playing from the adults. These reactions characterize most strongly – but not exclusively – the children who play entertaining games and express elements of achievement motivation.

The intensity of participating children's emotional reactions (the number of words and phrases spoken, the loudness of shouts, the number of cries) as a rule increased every next ten minutes, with the exception of those children who were not able to understand the rules of the games (the new ones, i.e. newly-bought for them) and got no advantage out of the adults' support. More precisely, in about one third of the five-years-old participants the intensity of emotional reactions decreased after ten minutes of playing, and a little over half of the five-years-olds (including the previously mentioned one-third) and four six-years-olds showed a decrease after twenty minutes; none of them played for more than half an hour.

It is worth mentioning that the minority of children, in particular – less than ten per cent of the participants, were able to finish the gaming sessions calmly and without showing any arousal, regardless of the scores. Such an attitude towards video gaming might form the basis of children's reasonable attitudes towards the use of computers and the Internet in general (not necessarily for gaming) in the future (i.e., in their teens and later, when they grow up); supposedly, they are likely to avoid any kind of the computer gamers' Internet addiction. This latter supposition should be tested in longitudinal follow-ups.

Generally speaking, video games resemble a sort of a *projective psychological test* since research assistants were able to estimate many psychological parameters such as the ability to overcome stress and manage the situations of both success and failure (even in long enough series of failures or winnings), as well as specific patterns of the achievement motivation, the level of development of the self-regulation mechanisms characterizing children's behavior.

Some of the participating children show different attitudes towards the computer as a tool for learning and entertainment, and towards different sorts of video games: they are able to classify the games reasonably enough – for example, as 'useful' and 'recommended by adults' vs. 'highly speedy', or 'highly emotional', or 'for even younger children'. They often express a tendency towards *animism* (as described by Jean Piaget [2]), i.e. towards perceiving computers, video game disks or gaming consoles as fully alive entities; even more often they believe that particular characters within the game environment are *alive* (or '*partly alive*', as three six-years-old participating children would repeatedly tell). More specifically, they tried to establish relations with the characters on the screen, to interact with them and ask to do favors, to praise or blame them for their particular actions. This tendency is stronger in the case of video games' correspondence to the well-known animated movies, and less strong in the case of educational games. Several participants were able to differentiate a video gaming and an animated movie environment: they would now and then ask why the characters within the gaming environment act differently from what happened in the movies.

The young children's tendency for animism directed towards computers and electronic gadgets, as well as the characteristics given to them, namely being '*partly alive*', was described earlier by Turkle [3]. The children who participated in the studies reported in Turkle's book in the late 1970s and early 1980s could (considering their age) become parents of the preschool-aged children who participated in our study; thus unlike newer and newer generations of communication and information technologies (for example, computers, cell phones, web sites and gadgets), human generations differ much less radically, and the earlier gained pioneering results *are still correct*.

Observation of the behavior of participating preschool-aged children shows that they sometimes acquire *indirect* ways of gaining competence in video gaming. Namely, some of the participating children were fond of looking at older children (in their families and/or in the kindergarten) playing video games. The elders readily replied to the 'why'-type and 'what'-type questions asked by the younger children; these replies were often very valuable, since the younger participants were able to use the replies and try to *develop new effective (i.e., winning) strategies* in their gaming behavior. These indirect types of gaining competence are especially characteristic of

those children whose parents or caregivers give them no support in video gaming and express little or no interest in the specifics of gaming behavior of their children. Lack of the parents' interest and support give preschool-aged children chances to play video games which do not match their age, and gain competence in the games meant for older children or even adults, including warfare games with cruel episodes and elements of love scenes.

Gender differences can be described as follows: boys prefer action games, arcade-like games, race-like games, and entertaining games, while many girls give equal preference to educational and entertaining games. When boys play educating games without external support, they often prefer to explore new strategies by probe and test procedures. Girls are more attentive, compared to the boys, to the instructions and elements of support provided by parents, caregivers or teachers. The adults believe that the boys are too often inattentive to their explanations and easily forget the given recommendations; in reality, however, the boys are fond of working out the strategies themselves, without any external instructions and recommendations more often than the girls.

This way of learning to be successful in video gaming is only seldom pursued by preschool-aged girls, although two of the participating six-years-old girls turned out to be extremely successful in working out their own original patterns and strategies leading to a quick and safe success. Meanwhile, six boys of the same age and even one five-year-old boy tended to create original and safe winning strategies in the new games they were just introduced to without any adults' support. It is worth mentioning that all nine of the abovementioned girls and boys were capable of reading the rules of the games.

Age differences between five and six-year-old children should be mentioned as well. Younger (five-year-old) participants encounter a lot more problems in successful gaming than the children who are a year older. The younger ones have problems in comprehending instructions and rules, as well as in remembering and following recommendations given by their parents, caregivers or teachers. They get tired in as little as twenty minutes (while about one fifth of them even earlier, i.e. in ten minutes), and in general, they were only rarely able to play effectively for more than half an hour.

The difficulties the younger children came across were partly dependent on the fact that they usually were not capable of reading, while video game producers now and then fail to duplicate in *audio* format essential explanations, which emerge on the screen. Having little success, the younger children soon tend to lose interest in the result, although they keep their interest in the gaming process, irrespectively of the likelihood of gaining success, winning, getting high scores, etc. This type of behavior was the most likely to occur when the children played entertaining games based on previously known to them animation movies.

While the older children tend to imagine the game characters alive, the younger children often express verbal descriptions of what they observe on the screen; these descriptions resemble patterns of a kind of an *egocentric* speech and often refer to episodes and actions which are irrelevant to the processes of effective gaming. The egocentric speech which some of the participating preschool-aged children produced during videogame playing behavior was not directed at anyone in particular, even



when the children played in kindergarten groups and/or with an adult who registered the gamer's behavior patterns nearby.

This type of egocentric behavior is characteristic of an egocentric position taken by children irrespectively of their surrounding (i.e., of being alone or in a group of children), as it was described in the classical writings by first Jean Piaget [2] and later by Lev Vygotsky [4]. The latter suggested an alternative (compared to his predecessor's, i.e. Piaget's views) interpretation of children's egocentrism: namely, Vygotsky explained and experimentally proved it to be an essential and necessary step toward the birth and proper development of the 'inner' (or internalized) speech and reflective thinking. Once again it is possible to state that the classic results which were first obtained long before the modern information and communication technologies became available, have been repeatedly observed in the current qualitative study.

## 5 Conclusions

The goals of the qualitative study have been fully fulfilled. The results suggest that preschool-aged children who play video games depend to the largest extent on their parents, caregivers and/or teachers. The adults should not restrain from providing their preschool-aged children access to certain video games, but at the same, the adults are expected to give them support, i.e. explain and show in practice how the children should play, what the most needed rules and instructions are, alongside with the ways to use a keyboard, a joystick and/or a mouse, to change and adapt screen size, etc. The role of an adult can be effectively performed by an older child as well, though in this case, the preschoolers may have easy access to video games that are not appropriate to their age and/or capabilities, which may cause negative effects on the preschoolers' moral and emotional development.

The producers of video games for as well as educators of preschool-aged children must provide thorough and detailed instructions both for children (in the audio format) and adults. The adults should have easy access to the full information about the peculiarities of particular games in order to make sure that they are able to make their children aware of these details and thus provide children with effective and timely recommendations. At the same time, the adults should be aware of the advantages and disadvantages of video gaming at preschool age; they should fully realize all the positive and negative aspects of the gaming process. This knowledge may supposedly help adults make sure that their children are not in danger of becoming Internet addicts when they grow up.

The younger (i.e., five-years-old) children meet more difficulties playing games aimed at the target group of preschoolers, compared to those children who are one year older. It is important to perform a profound quantitative investigation and to try to find more confirmations of this empirical fact. When and if this is done, it might be reasonable to recommend to producers of games for preschoolers to develop games that would better fit the five-years-old gamers — maybe simpler versions of the currently existing games. These simpler versions may require a shorter time to beat: the younger children get tired more quickly than the six-years-old children. One more

recommendation which also needs to be empirically backed is that providing somewhat flexible rules for the games, so that the most creative children have a better chance to use such flexible rules in order to work out original strategies of playing these games and getting positive results, i.e. winning. It should be noted that adults must assist the preschool-aged gamers in acquiring certain habits of self-regulation; if this is achieved, the children will be able to end the gaming sessions in due time irrespectively of the gaming scores and the likelihood of winning or losing in a current game session. It is important that this is done when children play both the entertaining and the educational games; moreover, the study has shown that while playing both types of games, the children may find it possible to perform cognitive as well as competitive actions.

It is important to note that the current study confirmed several effects that have been previously found – among them an effect that was discovered long before the birth of computers (such as animism and egocentrism). One of these effects (i.e., animism) was noted at the very start of studies of the effects relevant to the beginning of the era when for the first time children got a wide enough access to the use of information and communication technologies.

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