

## **BULGARIAN PARENTS' ATTITUDES TO LITERACY ACTIVITIES THROUGH DIGITAL DEVICES AND RELEVANT SOCIODEMOGRAPHIC FACTORS AT THE BEGINNING OF THE COVID-19 PANDEMIC**

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**Abstract.** This study aims to establish correlations between the use of digital devices for literacy activities and the demographic and socio-cultural characteristics of parents, children and the family during the onset of the COVID-19 pandemic in Bulgaria. The study includes parents of 172 children aged 2 to 8 who completed online questionnaires related to home learning activities and the use of digital devices by families and children. The findings show that parents have a positive attitude towards engaging in literacy and reading activities through digital devices with their children, but do not support the excessive use of digital devices by children. We found that older children, girls, and children who use digital devices to communicate with family members and friends are more likely to engage in literacy activities through digital devices. Our findings corroborate other recent studies in underscoring the importance of partnership between children and their parents for children's development in today's environment.

*Keywords:* children and digital technologies; optimal parental behavior; digital devices in literacy activities; COVID-19

Digital technologies are becoming progressively more important and integrated in every aspect of society, including in the fields of education and communication. As a result, children are surrounded by a variety of digital devices: computers, mobile devices, as well as smartphones and tablets<sup>1)</sup> (Holloway et al. 2013). Further, watching videos, playing games and searching for information on the internet is becoming an increasingly preferred everyday activity for children. Consequently, the virtual world becomes a place for socialization for children (Flewitt et al. 2014; Holloway et al. 2013; Lynch & Redpaht 2012). With regards to education, and especially in the context of COVID-19-related measures, such as school closures, affecting 1.6 billion children worldwide<sup>2)</sup>, 'digital literacy', defined as the ability to deal with signs, icons, symbols, and images, has become essential for the education of children, including in Bulgaria.

The interplay between Bulgarian parents' attitudes towards digital technologies, and their childrens' use of digital devices, placed in the particular context of COVID-19, will be the main focus of this article and the study placed at its core.

### **Digital devices in children's lives**

In order to better understand Bulgarian parents' attitude towards the use of digital technologies in literacy activities, it will be necessary to look into several contextual aspects, including the actual presence of digital devices in the lives of children in Bulgaria and abroad, the exact role of these devices in children's lives, some factors related to the use of digital devices, and the use of digital devices in training and literacy particularly during COVID-19, supplemented by some observable negative effects the use of digital devices may have on children.

With regard to the actual presence of digital devices in children's lives, several studies suggest there is an observable trend in increasing children's access to mobile digital devices and/or the internet worldwide (for more information, see Holloway et al. 2013; Marsh et al. 2015; Ofcom 2016; Rowsell, Saudelli, Scott, & Bishop 2013; Topić, Mihaljević & Veić 2019; United Nations Educational Scientific and Cultural Organization, 2014).

This seems to be in line with data from Bulgaria. One study, conducted by the National Center for Safe Internet and coordinated by the Applied Research and Communications Foundation and the Parents Association look at the use of digital technologies by children between the age of 0 and 8. This study found that before they reach the age of 8, most children use the Internet to play, study, watch and listen to various audio and video materials, as well as to communicate with other users (Shahbazyan et al. 2016).

Further, according to data from 2011, 62.9% of homes in Sofia, Bulgaria have internet, and 65.3% of families have a computer or laptop. However, this is not the case with the rest of Bulgaria. The difference between the capital and the rest of Bulgaria is significant, as only 43.9% of the total population has internet and 46.6% have computers. In small towns, these levels are around 30%, while in rural areas the percentage falls below 20%<sup>3)</sup>, suggesting a significant disparity in terms of access to digital devices and the Internet based on socio-demographic factors. More accurate and recent data are needed, yet if these disparities persist, it is likely that the COVID-19-related school closures, implying the undertaking of an online form of education, may be exacerbating preexisting problems related to access to information and education.

### **Factors influencing the use of digital devices by children**

Digital devices play a significant role in children's lives<sup>4)</sup> (Marsh et al. 2015; Ofcom 2016; United Nations Educational Scientific and Cultural Organization, 2014). Beyond reasons related to education and access to information, digital devices are

also used as a form of entertainment. Moreover, Bulgarian parents actually perceive the use of digital devices mostly as a form of entertainment, as suggested by a study interested in the role of digital devices in the lives of children from 3 to 4 years old (Shahbazyan et al. 2016).

Although a number of scientific sources emphasize the positive role of mobile and digital devices and note recommendations for their more active and widespread use with children<sup>5</sup> (Christakis 2014; Radesky, Schumacher & Zuckerman 2015), there are not many studies discussing the factors that influence digital device use. These factors are mainly related to the home environment, which is crucial in the development of safe behavior of children on the Internet. Further, it has been shown that parental use of digital devices and, in particular, smartphones significantly influences the use and attitude that the child has towards digital devices (Mascheroni & Ólafsson 2015). Research also addresses family practices for the use of technology at home (Stephen et al. 2013).

The degree of parental oversight in relation to the use of digital devices is relevant as well. It has been found that in younger children this monitoring is relatively easier. It is more common for young children to use a digital device with their parents than to do it alone (Marsh et al. 2015). It is interesting to note that in terms of gender differences, oversight over girls is stronger than over boys (Livingstone et al. 2011).

Conversely, children themselves grow and develop in an environment that accepts a good level of mastery of digital devices (Pink & Mackley 2013). In addition, a study conducted in Bulgaria found that children with older siblings became users of digital devices earlier than their peers (Shahbazyan et al. 2016).

The circumstances related to the introduction of digital technologies determine the expansion of the classification of parenting styles and practices aimed at their use. Active communication between parents and children is increasingly studied, and has been cited as a factor in reducing the likelihood that children will develop by manifesting obsessive Internet-related behaviors (van den Eijnden et al. 2010). Other authors point to the fact that parenting styles have the ability to counteract all risks on the Internet. It has been suggested that children raised in an environment of discussion and explanation have a clearer idea of the complexity and challenges of the Internet (Eastin et al. 2006; Lwin et al. 2008).

### **Literacy activities through digital devices**

Further, an important point is that digital devices have a role with regards to children's literacy. There are a number of practices that support the role of digital devices in introducing knowledge into literacy, reading and writing processes. These devices continue to become an integral part of everyday life, and young children use them increasingly more widely in literacy activities (Neumann & Neumann 2014; Verenikina & Kervin 2011). Regarding the contribution of digital devices to

the development of reading and writing skills, the use of tablets is shown to have a positive effect on skills related to the initial literacy process (Neumann & Neumann 2014; Topić, Mihaljević & Veić 2019). Similarly, e-reading is shown to contribute in the areas of phonological awareness, word reading, and vocabulary (Korat & Shamir 2008), as well as in relation to being effectively used as a facilitating tool for children with writing and reading difficulties (Olson et al. 1997).

Contrary to data looking at the positive effect of digital devices on various aspects, there are negative opinions in the research literature regarding the use of digital devices by children (Topić et al. 2019). The authors emphasize that the main contributing factors to the better development of the literacy process through the use of digital devices are the quality of the home environment, parent's participation in the reading process, and limiting the use of these devices for entertainment (Van Steensel, 2006).

### **Digital technologies in the lives of children during COVID-19**

In the period of COVID-19, we are witnessing the dynamics in the changed role of parents, school and digital technologies in the lives of children. According to the UNICEF, about 1.6 billion children have been affected by COVID-19-related measures throughout the world, hampering their right to education<sup>6</sup>. During this period, children did not attend kindergartens and schools and, accordingly, the main part of their education, including literacy education, took place in their homes, which puts parents and educational institutions in a changed situation. The fact that this form of online learning and teaching can become a regular phenomenon at least for a certain period of time is currently being discussed worldwide, with new restrictive measures progressively being imposed at the end of October, 2020 in France, Germany, and Bulgaria, amongst others. In Bulgaria, during this period the Ministry of Education and Science worked together with the Ministry of Health to draft health rules. At the forefront of these policies is the use of digital technologies in the online organization of distance learning in an electronic environment, as well as need to meet the new needs of children and families due to the growing national and global pandemic of COVID-19.

Although not much time has passed since the COVID-19 pandemic started, some data are available on how the education system, parents and children cope in this unusual learning environment. One of the most affected areas of the current situation related to children's development is the literacy process. Early childhood teachers have faced the serious challenge of providing families with literacy activities that mimic classroom practices (Fox 2020). It is also worth mentioning the best practices for distance learning used by teachers to deal with this unique situation during the pandemic, implemented in 21 kindergartens. The use of a blended learning model, such as conducting asynchronous and synchronous sessions, is described in this study. The article takes into account the benefits of these online sessions, related to

creating a sense of community and connection of children with their peers, as well as increasing the commitment and responsibility for their own learning process (Husain, 2020; Vu et al. 2020).

Despite the lack of data on the impact of the COVID-19 pandemic on children and especially on the literacy process for younger children, we need to discuss some negative trends. A study found that children taught on-line will have 67% lower literacy scores than those who have received traditional education at a regular kindergarten. The authors recommend future research to study the impact of school closure due to COVID-19 on children living in different socio-economic conditions (Bao et al. 2020).

Reporting on the negative aspects of distance learning is not lacking in Bulgaria either. Unfortunately, according to the Ministry of Education and Science, about 10 – 11% of the children in the education system were not covered by distance learning. Possible defeats are discussed, especially in terms of the process of literacy for the youngest students. It is argued that distance learning in its current form should rather be the last resort in the education system. The so-called “hybrid” form of training is currently being discussed. In it, some of the children can learn from home remotely, taking advantage of the achievements of digital technologies, modern educational platforms or video lectures broadcast from the classroom, while other students can actually attend school.

Even if we look beyond the context of a global pandemic and the measures related thereto, the use of digital technologies in the field of education and children’s literacy will be a topic that will continuously grow in importance and relevance due to the irreversible and central role digital technologies play in our lives.

### **The present study**

The aim of this study is to examine, in light of the changed online and digital environment for learning and literacy due to COVID-19, the attitude of Bulgarian parents and their children to the use of digital devices for literacy activities and ask the following questions:

- To what extent at the beginning of the COVID-19 pandemic is the use of digital devices for literacy activities in Bulgaria correlated with the demographic and socio-cultural characteristics of parents, children and the family?
- How do the parental patterns of behavior and the attitudes of parents and children towards new technologies correspond to the use of digital devices for literacy purposes?

### **Method**

#### **Participants**

One hundred seventy two parents of children aged 2 to 8 participated in this survey through online questionnaires. The children were on average 5 years old

(*Mean* = 62.08 months; *SD* = 27.6 months) and for the purposes of this study were divided into four age groups (34 children up to 3 years of age – 19.8%; 38 children from 3 to 5 years of age – 22.1%; 60 children from 5 to 7 years of age – 34.9%; 40 children from 7 to 8 years of age – 23.3%). 91 of the children in this study are boys (52.9%) and 81 (47.1%) are girls. 92 of the children are first-born (53.5%) and 80 are the youngest in the family (46.5%). Most children attend state kindergartens or schools (153 in number – 89%).

Regarding the parents, we note the following characteristics: the mothers are on average 36 years old (*Mean* = 35.92 years; *SD* = 5.02 years). The distribution by age categories for the purposes of this study is as follows: 88 of the mothers are aged between 24 and 36 years (51.2%), and 84 of them are aged between 37 and 49 years (48.8%). Regarding the educational level, the mothers were grouped in the following: 15 participants (8.7%) have high school education, and 91.3% have higher education – 22.7% have bachelor's degree and 68.6% have master's and doctoral degree (68.6%). For their part, fathers are on average 39 years old (*Mean* = 38.9 years; *SD* = 5.5 years). The distribution by age categories is: 90 of the fathers are between 22 and 39 years old (52.3%), and 82 of them are between 37 and 54 years old (47.7%). Their level of education is the following: 70 participants (40.7%) have high school education, 31 participants have bachelor's degrees (18%), and 71 participants have master's and doctoral degrees (41.3%).

Bulgarian families tend to not be large and this study supports this fact. Sixty nine of the participating families (40.1%) have only one child and 103 (59.9%) have more than one, with only 10 families (5.8%) having more than 2 children. Families participating in the study tend to live in urban areas (162 families; 94.2%), and a much smaller percentage live in rural areas (10 families; 5.8%).

### **Measures**

Components of several questionnaires were combined and adapted (Aram & Levin 2014; Meoded Karabanov & Aram 2020): Pentagon Optimal Parenting Model (PPM); Home Learning Experiences Questionnaire (HLEQ); Activities with Digital Devices at Home (Sonnenschein et al. 2019). The questionnaires were preceded by a set of demographic questions.

**Pentagon Parenting Model (PPM).** This questionnaire is based on the five principles of the Pentagon Parenting Model (PPM) (Partnership, Humanistic Leadership, Giving Unconditional Love, Encouraging Independence and Adhering to Rules) and is used to provide guidance to parents (Aram & Levin 2014; Meoded Karabanov & Aram 2020). The questionnaire included 52 items, and parents are required to mark their answer on the basis of a frequency scale from 1 to 6 (1-never; 6-always). When applying the questionnaire in the Bulgarian socio-cultural environment, high psychometric indicators are established for the five principles: the partnership between those responsible for raising children ( $\alpha = .87$ ; 12 items);

parental leadership ( $\alpha = .74$ ; 9 items); the expression of love ( $\alpha = .87$ ; 12 items); the promotion of independence ( $\alpha = .80$ ; 7 items) and the adhering to rules ( $\alpha = .77$ ; 9 items). **Home Learning Experiences Questionnaire (HLEQ)**. The HLEQ questionnaire consists of 23 items and requires answers that are ranked on a scale of 1 to 5: 1 – never, 2 – a little, 3 – somewhat, 4 – a lot, 5 – very often (Aram & Levin 2014). It includes activities that parents perform at home with their children, involving reading and writing (e.g., “Encourage the child to write his/her name and names of family members”); physical activities; digital literacy activities and manipulative activities (e.g., “Create the alphabet from various materials: bake letter cookies, make letters with Play-Doh or clay, etc.”).

**Activities with Digital Devices at Home** (Based on Sonnenschein et al., 2019). The questionnaire aims to examine the activities that parents and their children perform at home using digital devices. Some of the questions aim to find out how many electronic devices families have, which of them children use as a priority and for what purpose; how many hours on average children use digital devices alone or with their parents, etc. Most of the questions require answers on a 5-point scale. In this study, the questionnaire is used by identifying separate categories, such as: activities that are only related to digital literacy, attitude and behavior of parents towards the use of digital devices by their children, and attitude and behavior of children towards the use of digital devices.

**Literacy through Digital Activities (LDA)**. For the purposes of this study, a separate scale was created – Literacy through Digital Activities, which combines 10 items from the HLEQ questionnaires and the Activities with Digital Devices at Home Questionnaire (Sonnenschein et al., 2019). When checking the internal consistency of the scale, high psychometric indicators are established - Cronbach's alpha coefficient ( $\alpha = .80$ ).

### **Procedure**

The questionnaires were translated into Bulgarian and presented via Google Forms and distributed on social media sites (Facebook). A total of 172 Bulgarian families completed the questionnaires in April 2020. Participants were told that the study aimed to establish the behaviors and activities of parents at home with their young children between the ages of 2 and 8 during the days of isolation due to COVID-19.

### **Data Analysis**

The program SPSS 23 was applied during the statistical processing.

The t-test between subjects and One Way ANOVA between subjects were used to verify the significant effect of demographic characteristics. Correlation analysis was applied to verify the relationships between the studied phenomena. To check the internal consistency of the individual Pentagon Parenting Model (PPM) scales,

as well as the newly created Literacy through Digital Activities (LDA) scale, Reliability analysis was applied, which shows the value of the Cronbah's alpha ( $\alpha$ ) coefficient.

### **Results**

The presentation of the results is structured in the following way: first, presentation of the frequency distributions for some items in order to better interpret them in the analysis of the data; next, comparative data on the differentiating effect of demographic characteristics from t-test between subjects and One Way ANOVA between subjects; finally, relationships between the studied phenomena based on the results of the applied correlation analysis.

### **Preliminary analyses and frequency distributions**

According to the data from Table 1, about 91.3% of the families own more than 3 mobile phones; 17.4% have three or more tablets; 51.2% have three or more computers in their homes, and 65% have three or more TVs.

**Table 1.** Frequency distribution of the owned digital devices

Number of devices	mobile phone		tablet/ipad		computer		television	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
One device	4	2,3	61	35,5	12	7,0	11	6,4
Two devices	11	6,4	81	47,1	72	41,9	51	29,7
Three devices	75	43,6	26	15,1	61	35,5	67	39,0
Four devices and more	82	47,7	4	2,3	27	15,7	43	25,0
Total	172	100,0	172	100,0	172	100,0	172	100,0

At the same time, children's preferences for the devices used are as follows: 37.8% prefer to use mobile phones, 29.1% prefer to watch TV, 22.1% prefer tablets, and 11% are attracted to the use of computers. Approximately 80% of children use them for more than 2 hours, At the same time, 94.1% of parents determine that the allowable number of hours for their children to use digital devices should be less than 2 hours.

Another interesting fact that is important for the interpretation of the results is that in terms of determining the usefulness of digital devices for children's development, we observe the following data: 34.3% of parents define them as harmful or very harmful; 16,% believe that they are not important for children's development, and 48, 8% believe that these devices contribute to children's development. This to some extent explains the fact that 77.9% of parents take an active part in the selection of the content of digital information that reaches children. Regarding the extent to

which parents themselves use digital devices at work and in their free time, the data shows that 75% of parents professionally have to use these devices to a high and very high degree, and 43.6% use them very actively in their free time.

**To what extent at the beginning of the COVID-19 pandemic is the use of digital devices for literacy activities in Bulgaria correlated with the demographic and socio-cultural characteristics of parents, children and the family?**

The statistical significance of the study results was checked by a t-test between subjects (at  $p < 0.05$ ). The LDA results were compared for: gender differences, child order, number of children in the family, age of mothers and age of fathers.

The results did not show significant statistical differences in terms of the number of children in the family ( $t(161)=1.798$ ;  $p > .05$ ) sequence of the child ( $t(170)=.476$ ;  $p > .05$ ); age of mothers ( $t(170)=1.134$ ;  $p > .05$ ), and age of fathers ( $t(170)=.410$ ;  $p > .05$ ). Statistically significant differences were found only with respect to gender ( $t(170)=2.01$ ;  $p < .05$ ). It is reported that literacy activities through digital devices are done much more often with girls ( $M = 2.48$ ) than with boys ( $M = 2.28$ ). This is somewhat at odds with other sources who argue that restrictions and controls on the use of digital devices are greater for boys than for girls (Livingstone et al., 2011). and a comparison of their targeting towards girls rather than boys.

One Way ANOVA between subjects was performed to compare values and arithmetic means for more than two groups. The effect on LDA of the following factors was examined - the age of children, the age of mothers and fathers, the preferred digital device by the child (at  $p < 0.05$ ). There were statistically significant differences in the LDA depending on: the age of the children ( $F(3,168)=8.22$ ;  $p < .05$ ), the education of the fathers ( $F(3,168)=4.36$ ;  $p < .05$ ), and the preferred digital device of the child ( $F(3,168)=8.18$ ;  $p < .05$ ). No statistically significant differences were found in the education of the mothers ( $F(3,168)=.41$ ;  $p < .05$ ).

As noted, significant differences were found depending on the age of the children and the use of digital literacy devices. The highest values are registered in children between 5 and 7 years of age, and the lowest in those up to 3 years of age. Based on multiple comparisons, it was found that the significant differences are between children under 3 years of age and those between 5 and 7 years of age. This result implies that Bulgarian children most actively use digital devices for literacy between 5 and 7 years of age.

At the same time, the father's education level was found to have a significant differentiating effect on the LDA. The highest values are registered for fathers with high school education, and the lowest for those with a bachelor's degree, and it is between these two groups that significant differences from Multiple Comparisons are found. This result shows that fathers with a bachelor's degree are found to be the least likely to use digital devices in their children's literacy process.

The data from this study also showed statistically significant differences in the LDA depending on the use of digital devices for literacy and the child's preferred digital device.

The most common means of digital literacy education is the use of a tablet and computer, and the least common is watching television. Multiple Comparisons records significant differences between the use of the TV and all other digital devices - mobile phone, tablet and computer as a means of developing children's literacy.

**How do the parental patterns of behavior and the attitudes of parents and children towards new technologies correspond to the use of digital devices for literacy purposes?**

Correlation analysis data were also evaluated, the value of which shows whether there is a significant level dependence between the correlated variables at  $p < 0.05$ .

Table 2 presents the results of the relationship between the LDA and parents' attitudes towards their children's use of digital devices. We can note that compared to other digital devices, the LDA is moderately statistically dependent on the presence of a tablet in the family. In addition, the use of digital devices for literacy activities is closely related to a positive attitude of the parents towards their use by children. The opinions of parents about whether these devices favor the child's development are strongly correlated with how often they use them together with the child.

**Table 2.** Correlation analysis between LDA and parents' attitudes towards children's use of digital devices

	Digital literacy activities
What digital devices do you have at home, and number of each device – mobile phone	.017
What digital devices do you have at home, and number of each device – tablet/ipad	<b>.293**</b>
What digital devices do you have at home, and number of each device – computer	.003
What digital devices do you have at home, and number of each device – television	.081
To what degree do you encourage your child to use these devices	<b>.230**</b>
To what extent is it important that preschoolers use digital devices	<b>.263**</b>
In your opinion, what is the optimal amount of time for 4-6-year-old children to spend on digital devices, per day	<b>.212**</b>
In your opinion, to what degree does using digital devices contribute to the development of 4-6-year-old children	<b>.219**</b>

How would you characterize the situations at home where activities with digital devices take place	.261**
To what extent do you and your child work on digital devices at home together	.383**
What is your level of involvement in selecting digital content that your child uses	.086
What is your level of use of digital devices for work	.142
What is your level of use of digital devices in your free time	.091

\*\* Correlation is significant at the 0.01 level (2-tailed)

This study found a high statistical relationship between the LDA and some characteristics of children's attitudes toward digital device use, including children's independent use of digital devices for entertainment. The data show that children who use digital devices to communicate with their siblings, older relatives and friends are also more likely to include digital devices in literacy activities (Table 3).

**Table 3.** Correlation analysis between LDA and children's attitudes towards the use of digital devices

	Digital literacy activities
How much time, on average, does your child spend using digital devices, per day	.254**
To what extent do you think your child enjoys using the digital devices at home	.305**
To what extent does your child use digital devices at home with siblings	.228**
To what extent does your child use digital devices at home with friends online	.352**
To what extent does your child use digital devices at home with grandparents online	.282**
To what extent does your child know how to operate digital devices independently	.400**

\*\* Correlation is significant at the 0.01 level (2-tailed)

With regard to the individual statements included in the LDA value and the parameters of the optimal parental model (PPM), a weak statistical relationship was found between the principle of “Adhering to Rules” with games involving reading on digital devices ( $r=.161$ ;  $p<.05$ ) and the principle of “Partnership” with digital books ( $r=.162$ ;  $p<.05$ ). This gave us reason to look for correlations between the principles of PPM and the overall attitude of parents towards the use of digital devices by their children (Table 4).

It should be noted that encouraging children to use digital devices is negatively correlated with the principles of the “Partnership between those responsible for

raising children”; “Humanistic Leadership”; “Encouraging Independence” and “Adhering to Rules”, i.e. parents who are guided by these principles are reluctant to tolerate the use of digital devices by their children. On the other hand, parents holding the opinion that the use of digital devices is important and contributes to the development of their children is negatively correlated with the principle of “Encouraging Independence” and “Adhering to Rules”, i.e. parents who are more tolerant of their children's autonomy and following of rules do not support the view that digital devices are an important factor in children's development. In contrast, however, the involvement of parents in the selection of digital content that their children use with electronic devices is positively linked to the principle of “Humanistic Leadership” and the principle of “Encouraging Independence”, i.e. positive leadership and the requirement to stimulate children's independence provokes the active participation of parents in terms of what their child does and what content is involved in the use of digital devices. Interestingly, statistically significant correlations were also found between the use of digital devices in leisure time by the parents themselves with the five parameters of PPM: Partnership, Humanistic Leadership, Giving Unconditional Love, Encouraging Independence and Adhering to Rules. This finding leads to the conclusion that parents who have high PPM scores use digital devices in minimal or moderate amounts outside of their official duties.

**Table 4.** Correlation analysis between parents' attitudes towards their children's use of digital devices and PPM parameters

	Partnership	Leadership	Love	Independence	Rules
To what degree do you encourage your child to use these devices	<b>-.156*</b>	<b>-.199**</b>	<b>-,116</b>	<b>-.205**</b>	<b>-.170*</b>
To what extent is it important that preschoolers use digital devices	-,091	-,085	-,088	<b>-.202**</b>	-,072
In your opinion, what is the optimal amount of time for 4-6-year-old children to spend on digital devices, per day	,003	-,008	-,041	-,138	-,053
In your opinion, to what degree does using digital devices contribute to the development of 4-6-year-old children	-,128	<b>-.161*</b>	-,139	<b>-.296**</b>	<b>-.176*</b>
How would you characterize the situations at home where activities with digital devices take place	<b>-.227**</b>	<b>-.220**</b>	<b>-.200**</b>	<b>-.297**</b>	-,149

To what extent do you and your child work on digital devices at home together	-,040	-,062	-,047	-,128	-,125
What is your level of involvement in selecting digital content that your child uses	,132	<b>.194*</b>	,131	<b>.259**</b>	,106
What is your level of use of digital devices for work	,038	,009	-,033	-,019	-,005
What is your level of use of digital devices in your free time	<b>-.365**</b>	<b>-.184*</b>	<b>-.201**</b>	<b>-.260**</b>	<b>-.213**</b>

*\* Correlation is significant at the 0.05 level (2-tailed); \*\* Correlation is significant at the 0.01 level (2-tailed)*

### **Discussion**

The aim of this study was to establish the relationship between the use of digital devices for literacy activities with socio-demographic variables and parental patterns of behavior in the Bulgarian socio-cultural community in the changed environment for learning and literacy at the beginning of COVID- 19 pandemic in Bulgaria.

These findings confirm the global trend of increasing use of digital devices by children and their parents in the Bulgarian socio-cultural environment, noting an increase in the duration of usage, number of devices, and nature of the activities (e.g. work, entertainment and communication).

Second, a significant link has been established between the LDA and shared digital literacy activities by parents and their children, and parents who adhere to the principles of PPM have been found to exhibit a positive attitude towards digital literacy activities. At the same time, parents with a higher level of education do not support the excessive use of digital devices.

Third, the LDA value was significantly correlated with age (older Bulgarian children use digital literacy devices more than younger children), gender (girls use digital literacy devices more than boys), and the use of these devices for communication between the child and the family (siblings and elderly relatives) and friends.

Each of these results are discussed independently in greater detail.

### **The use of digital devices by Bulgarian children and families at the Beginning of the COVID-19 Pandemic**

The current study reveals that Bulgarian children aged 2 to 8 have a very high rate of internet and digital device use (mobile phones, tablets, computers and televisions). In general, there is an increase in the number of devices at homes, and increasingly more children have their own personal digital devices from an early age. These data are similar to a number of studies in Europe and the rest of the world (Common Sense Media 2013; Flewitt et al. 2014; Holloway et al. 2013;

Lynch & Redpath 2012; Ofcom 2016). These results are a kind of continuation and confirmation of the trend for increasing use of Internet devices (tablets and smartphones) for entertainment and communication by preschool children in Bulgaria, reflected in a study from 2016 (Shahbazyan et al. 2016). According to our study, during the beginning of the COVID-19 pandemic, there has been a tendency to increase the role of mobile phones, which are beginning to displace the use of tablets, found to be the preferred digital device in the study in Bulgaria conducted about 5 years ago (Shahbazyan et al., 2016).

At the same time, we find some discrepancy between the number of hours children use digital devices and parents' views on the optimal time for children to use them. Similar data are confirmed in the Czech Republic, Canada, Australia, USA and others. (Rowse, Saudelli, Scott, & Bishop 2013; Topic, Mihaljevic, & Veic, 2019; United Nations Educational Scientific and Cultural Organization 2014). The results of the present study show that a very large percentage of children aged 2 to 8 years spend more than 2 hours a day in front of screens, which again reveals a growing trend in Bulgaria compared to the data from 2016 (Shahbazyan et al. 2016). At the same time, 94.1% of the Bulgarian parents included in the survey determined that the permissible number of hours for the use of digital devices by their children should be less than 2 hours. This opinion is in line with the 2019 recommendations of the World Health Organization that the use of these devices for children up to 5 years of age should be limited to 1 hour per day (World Health Organization, 2019)<sup>7</sup>.

The finding in this study that the use of digital devices for literacy purposes is related to the age and gender of children, as well as their use to communicate with family and peers, is an extension of findings of other researchers. In the period of COVID-19, Bulgarian children aged between 5 and 7 years most actively use digital devices for literacy, and the most significant differences were found between children aged 5 to 7 years and those up to 3 years of age. This finding expands and confirms the fact that the period around 5 years of age is critical for the development of literacy of Bulgarian children (Shtereva 2012, 2017).

At the same time, this correlates with the findings of a number of authors that the use of digital devices for certain literacy activities has a positive impact on the skills associated with the initial development of this process (Marsh, 2004; Neumann & Neumann 2014; Stephen, Stevenson, & Adey 2013; Verenikina & Kervin 2011).

Another interesting finding from the present study is that girls are much more likely to engage in literacy activities using digital devices than boys, contrary to previous published data that the restrictive measures regarding the use of digital devices are greater for girls (Livingstone et al. 2011). To understand that, it is necessary to provide a study on the different types of literacy practices applied by Bulgarian parents and to what extent they are aimed at girls rather than boys in the family.

At the beginning of the COVID-19 pandemic, a large percentage of countries around the world, including Bulgaria, imposed restrictions on social isolation, so that the use of digital devices by children to communicate with their extended family members and friends was the only means of communication with the world outside the immediate vicinity. The study presented here confirmed that it is precisely children that have been communicating more using electronic technologies during the pandemic, who are the ones more likely to use them for literacy activities. The connection between the earlier use of digital devices by children who have older siblings has been confirmed by a previous study in Bulgaria (Shahbazyan et al. 2016).

### **Literacy activities with digital devices and parental patterns of behavior and attitudes towards their use**

Another key finding in the present study is related to the established general tendency of Bulgarian parents to have a positive attitude and encourage children to use digital devices for literacy purposes, as well as their engagement in these activities.

We found that at the beginning of the COVID-19 pandemic and in a situation of social isolation of families and children at their homes, the behavior of Bulgarian parents adhering to the principles of PPM reveals a positive attitude towards literacy games with digital devices and reading digital books. This finding is supported by a number of studies in which e-reading for children is a practice recognized by parents as a way that expands learning opportunities. On the other hand, some authors discuss the positive role of these activities for children with learning difficulties (Korat & Shamir 2008; Olson et al. 1997).

The study found that parents who adhere to the PPM “Adhering to Rules” principle have a positive attitude towards digital games that involve reading, while not tolerating the excessive use of digital devices by children. Various other researchers point to the active mediation of parents in providing an environment for discussion and explanation as an important factor in raising children, pointing out the importance of giving children a clear idea of the complexity and challenges of the Internet and new technologies (Lwin et al., 2008; van den Eijnden et al. 2010).

On the other hand, this study found that PPM's principles of “Humanistic Leadership”, “Partnership” and “Encouraging Independence” correlates with the active participation of parents in selecting the digital content displayed to their children. A number of authors emphasize the important role of cooperation between parents and their young children in the use of digital devices (Helsper et al. 2013; Marsh et al. 2015). These findings are strongly consistent with current research related to COVID-19, in which the authors discuss the importance of partnership between children and parents for children's development in today's environment, including the application of mixed/hybrid learning models. (Fox 2020; Husain 2020; Vu P., Meyer R., & Taubenheim K. 2020).

In this discussion, it is important to emphasize the fact of some established negative relationships between the principles of PPM and the studied parameters. On the one hand, we find disapproval from Bulgarian parents who adhere to the principles of “Partnership”; “Humanistic Leadership”; “Encouraging Independence” and “Adhering to Rules”, of the excessive use of digital devices by children. All this is in line with the data presented in the 2016 report by Bulgaria, which discusses the contradictory attitude of Bulgarian parents towards digital devices and the fact that they define them as a form of entertainment and not as an opportunity to acquire knowledge from children (Shahbazyan et al. 2016). This may be one of the possible reasons for the findings of the present study that parents who perform well in terms of the principles of “Encouraging Independence” and “Adhering to Rules”, as well as those with higher education do not rely completely on digital devices in the process of development and literacy of their children.

### **Limitation, perspectives and conclusion**

Some limitations must also be taken into account in the present study.

Firstly, some socio-demographic limitations are noted. The study focuses on the perspective of the issues discussed by one of the parents, as the questionnaires were filled in mainly by mothers. In addition, the study included families living in cities and almost no representatives of rural areas in Bulgaria.

Further, there was a predominance of parents with higher education. In this sense, it is good to reproduce the survey by including a larger sample of parents, and if possible both parents fill in the questionnaires, as well as to have representatives of different demographic regions of the country.

Secondly, we do not have sufficiently convincing data on parental patterns of behavior and parents' attitudes towards the use of digital devices for literacy activities before the COVID-19 period in Bulgaria. In this sense, what was found in this study reflects the current state of the issues discussed, so the conclusions made here are rather interpretive.

Thirdly, the study was carried out at the beginning of the COVID-19 pandemic and in this sense relies on the possibility of repeating it in the future to take into account the specifics of the current situation and changes in attitudes towards literacy through the use of digital devices in the conditions of an ongoing pandemic. This is particularly important because of the belief that the harmful effects of the pandemic situation are most significant for the youngest children, especially in terms of literacy, socialization and communication processes.

In conclusion, we find that the model of attitudes towards the use of digital literacy devices during the COVID-19 pandemic in Bulgaria varies depending on the socio-demographic characteristics of families. Despite these complexities, continuing to study the use of digital technologies in children's education and literacy is extremely relevant is an issue of utmost importance.

## NOTES

1. Common Sense Media. 2013. Zero to eight: Children's media use in America 2013. Retrieved from <https://www.commonsensemedia.org/sites/default/files/research/zero-to-eight-2013.pdf>
2. UNICEF (2020) <https://data.unicef.org/covid-19-and-children/>
3. NSI Census 2011 – Final Results, Sofia: National Statistical Institute. [in Bulgarian] <http://www.nsi.bg/sites/default/files/files/pressreleases/Census2011final.pdf>
4. Common Sense Media. 2013. Zero to eight: Children's media use in America 2013. Retrieved from <https://www.commonsensemedia.org/sites/default/files/research/zero-to-eight-2013.pdf>
5. NAEYC and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College. (2012). Technology and interactive media as tools in early childhood programs serving children from birth through age 8. Retrieved from [http://www.naeyc.org/files/naeyc/PS\\_technology\\_WEB.pdf](http://www.naeyc.org/files/naeyc/PS_technology_WEB.pdf)
6. UNICEF (2020) <https://data.unicef.org/covid-19-and-children/>
7. Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age. World Health Organization. <https://apps.who.int/iris/handle/10665/311664>. License: CC BY-NC-SA

## REFERENCES

- Aram, D., & Levin, I., 2014. Promoting early literacy: The differential effects of parent-child joint writing and joint storybook reading interventions. In: Chen, R. (Ed.), *Psychology research progress. Cognitive development: Theories, stages and processes and challenges* (189 – 212). Nova Science Publishers.
- Bao, X., Qu, H., Zhang, R., & Hogan, T. P., 2020, May 13. Modeling Reading Ability Gain in Kindergarten Children during COVID-19 School Closures. *Int. J. Environ. Res. Public Health*, 17, 6371. <https://doi.org/10.3390/ijerph17176371>
- Christakis D. A., 2014. Interactive media use at younger than the age of 2 years: time to rethink the American Academy of Pediatrics guideline?. *JAMA pediatrics*, 168(5), 399 – 400. <https://doi.org/10.1001/jamapediatrics.2013.5081>
- Eastin, M., Greenberg, B., & Hofschire, L., 2006. Parenting the Internet. *Journal of Communication*, 56, 486 – 504. <https://doi.org/10.1111/j.1460-2466.2006.00297.x>
- Flewitt, R., Messer, D., & Kucirkova, N., 2015. New directions for early literacy in a digital age: The iPad. *Journal of Early Childhood Literacy*, 15(3), 289 – 310. <https://doi.org/10.1177/1468798414533560>
- Fox, K., 2020. Bidirectional Benefits from School to Home Literacy Practices in the Early Childhood Virtual Classroom. In Ferdig, R.E.,

- Baumgartner, E., Hartshorne, R., Kaplan-Rakowski, R. & Mouza, C. (Eds). 2020. *Teaching, Technology, and Teacher Education During the COVID-19 Pandemic: Stories from the Field*. Association for the Advancement of Computing in Education (AACE). Retrieved June 15, 2020 from <https://www.learntechlib.org/p/216903/>. P. 133-141
- Helsper, E. J., Kalmus, V., Hasebrink, U., Sagvari, B., & DeHaan, J., 2013. Country Classification: Opportunities, Risks, Harmand Parental Mediation, *LSE*. London: *EU Kids Online*.
- Holloway, D., Green, L. and Livingstone, S., 2013. Zero to Eight: Young Children and their Internet Use, LSE, *London and EU Kids Online*, pp. 10 – 13. [https://www.open.edu/openlearn/ocw/pluginfile.php/559256/mod\\_resource/content/3/Zero%20to%20Eight.pdf](https://www.open.edu/openlearn/ocw/pluginfile.php/559256/mod_resource/content/3/Zero%20to%20Eight.pdf)
- Husain, N., 2020 (March 26). Learn from home: 20 best practices for remote learning in K–12. Ring Central. <https://www.ringcentral.com/blog/learn-from-home-20-best-practices-for-remote-learning-in-k-12/>
- Korat O., & Shamir A., 2008. The Educational Electronic Book as a Tool for Supporting Children's Emergent Literacy in Low versus Middle SES Groups, *Computers & Education* 50: 110 – 24.
- Livingstone, S. and Haddon, L. and Görzig, A. and Ólafsson, K., 2011. Risks and safety on the internet: the perspective of European children: full findings and policy implications from the EU Kids Online survey of 9 – 16 year olds and their parents in 25 countries. *EU Kids Online*, Deliverable D4. EU Kids Online Network, London, UK.
- Lwin, M.O., Stanaland, A., & Miyazaki, A., 2008. Protecting children's privacy online: How parental mediation strategies affect website safeguard effectiveness. *Journal of Retailing*, 84, 205 – 217.
- Lynch, J., & Redpath, T., 2014. 'Smart' technologies in early years literacy education: A meta-narrative of paradigmatic tensions in iPad use in an Australian preparatory classroom. *Journal of Early Childhood Literacy*, 14(2), 147 – 174. <https://doi.org/10.1177/1468798412453150>
- Marsh, J., Plowman, L., Yamada-Rice, D., Bishop, J.C., Lahmar, J., Scott, F., Davenport, A., Davis, S., French, K., Piras, M., Thornhill, S., Robinson, P. & Winter, P., 2015. *Exploring Play and Creativity in Pre-Schoolers' Use of Apps: Final Project Report*. Accessed at: [www.techandplay.org](http://www.techandplay.org).
- Marsh, J., 2004. The Techno-Literacy Practices of Young Children. *Journal of Early Childhood Research*, 2(1), 51 – 66. <https://doi.org/10.1177/1476718X0421003>
- Mascheroni, G., & Ólafsson, K., 2016. The mobile Internet: Access, use, opportunities and divides among European children. *New Media & Society*, 18(8), 1657 – 1679. <https://doi.org/10.1177/1461444814567986>

- Meoded Karabanov, G. & Aram, D., 2020, June. Literacy activities with preschool children in the digital home environment and children's early literacy. Paper presented at the Society for Scientific Studies of Reading annual conference. Los Angeles,. USA. <https://www.triplesr.org/literacy-activities-preschool-children-digital-home-environment-and-children%E2%80%99s-early-literacy>
- Neumann, M., & Neumann, D., 2014. Touch screen tablets and emergent literacy. *Early Childhood Education Journal*, **42**(4), 231 – 239.
- NSI (2020). <https://www.nsi.bg/en/content/6593/population-demography-migration-and-projections>
- Ofcom (2016). Adults Media Use and Attitudes Report 2016. [https://www.ofcom.org.uk/\\_\\_data/assets/pdf\\_file/0026/80828/2016-adults-media-use-and-attitudes.pdf](https://www.ofcom.org.uk/__data/assets/pdf_file/0026/80828/2016-adults-media-use-and-attitudes.pdf)
- Olson R., Wise B., Ring J., & Johnson N., 1997. Computer-Based Reading Remedial Training in Phoneme Awareness and Phonological Decoding: Effects on the Posttraining Development of Word Recognition, *Scientific Studies of Reading* **1**(3), 235 – 253 [https://doi.org/10.1207/s1532799xssr0103\\_4](https://doi.org/10.1207/s1532799xssr0103_4)
- Pink, S., & Leder Mackley, K., 2013. Saturated and situated: expanding the meaning of media in the routines of everyday life. *Media, Culture & Society*, **35**(6), 677 – 691. <https://doi.org/10.1177/0163443713491298>
- Radesky, J. S., Schumacher, J., & Zuckerman, B., 2015. Mobile and interactive media use by young children: the good, the bad, and the unknown. *Pediatrics*, **135**(1), 1 – 3. <https://doi.org/10.1542/peds.2014-2251>
- Rowell, J., Saudelli, M., Scott, R., & Bishop, A., 2013. iPads as Placed Resources: Forging Community in Online and Offline Spaces. *Language Arts*, **90**(5), 351 – 360. Retrieved September 23, 2020, from <http://www.jstor.org/stable/24574993>
- Shahbazyan L., Haidinyak M., Kumanova A., 2016. *Children up to 8 years and digital technologies Qualitative research – Bulgaria*, National Center for Safe Internet Sofia, Bulgaria [in Bulgarian].
- Shtereva, K., 2012. Structure of the Phonological Awareness by Bulgarian Children, *J. Psychological Research*. Iss. 1, 25 – 45; Available at: <https://www.ceeol.com/search/article-detail?id=69282> [in Bulgarian].
- Shtereva, K., 2017. Implementation of the Process of Reading and Associated Factors, *J. Pedagogy*. Iss. 1, 98 – 116. Available at: <https://www.ceeol.com/search/article-detail?id=555147> [in Bulgarian].
- Sonnenschein, S., Dowling, R., & Shanty, L., 2019, June. *The evaluation*. In Diamant-Cohen (Chair). Reaching vulnerable families through collaborative partnerships. Symposium presented at ALA, Washington, D.C. /67 Presentation

- Stephen, C., Stevenson, O., & Adey, C., 2013. Young children engaging with technologies at home: The influence of family context. *Journal of Early Childhood Research*, **11**(2), 149 – 164. <https://doi.org/10.1177/1476718X12466215>
- Topić, M., Mihaljević, S., & Veić, V., 2019. Engagement with digital media in home environment and school readiness in croatian preschool children. In R. Brito & P. Dias (Coords.), *Crianças, famílias e tecnologias. Que desafios? Que caminhos?* (pp. 66-80) *Lisboa: Centro Interdisciplinar de Estudos Educacionais*. <https://doi.org/10.34629/ipl.eselx.cap.livros.016>
- United Nations Educational Scientific and Cultural Organization. 2014. Reading in the mobile era: A study of mobile reading in developing countries. <file:///C:/Users/Katerina/Downloads/Reading%20in%20the%20mobile%20era.pdf>
- van den Eijnden, R. J., Spijkerman, R., Vermulst, A. A., van Rooij, T. J., & Engels, R. C. (2010). Compulsive internet use among adolescents: bidirectional parent-child relationships. *Journal of abnormal child psychology*, **38**(1), 77 – 89. <https://doi.org/10.1007/s10802-009-9347-8>
- van Steensel, R., 2006. Relations between socio-cultural factors, the home literacy environment and children's literacy development in the first years of primary education. *Journal of Research in Reading*, **29**(4), 367 – 382. <https://doi.org/10.1111/j.1467-9817.2006.00301.x>
- Verenikina, I., & Kervin, L., 2011. iPads, digital play and preschoolers. *He Kupu*, **2**(5), 4 – 19.
- Vu P., Meyer R., & Taubenheim K., 2020. Best Practice to Teach Kindergarteners Using Remote Learning Strategies. In Ferdig, R.E., Baumgartner, E., Hartshorne, R., Kaplan-Rakowski, R. & Mouza, C. (Eds). (2020). *Teaching, Technology, and Teacher Education During the COVID-19 Pandemic: Stories from the Field*. Association for the Advancement of Computing in Education (AACE). Retrieved June 15, 2020 from <https://www.learntechlib.org/p/216903/>. 141 – 145

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