CRIANÇAS, FAMÍLIAS E TECNOLOGIAS. QUE DESAFIOS? QUE CAMINHOS?

COORDENAÇÃO |

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Crianças, famílias e tecnologias. Que desafios? Que caminhos?

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ÍNDICE_

INTRODUÇÃO

A sociedade em que vivemos está profundamente marcada pela integração das tecnologias digitais no nosso quotidiano. Assim, as crianças nascem em lares onde proliferam o computador, os smartphones e os tablets, tendo contacto com estes dispositivos desde cada vez mais cedo, utilizando-os nas suas rotinas diárias, procurando estar entretidas constantemente.

Estes dispositivos são as "varinhas mágicas" contemporâneas, capazes de apoiar as crianças na obtenção de entretenimento, na exploração dos seus interesses e curiosidades, em simulações, e mesmo na socialização. Por outro lado, as crianças estão expostas a riscos online, tais como o contacto com conteúdos que não são apropriados para a sua idade, a recolha de dados para exploração comercial, os riscos de segurança e invasão de privacidade e contacto com estranhos.

A "digitalização" da infância e o ritmo acelerado, sem precedentes, do desenvolvimento tecnológico, colocam novos desafios aos vários intervenientes na proteção dos direitos das crianças, nomeadamente aos pais e à escola.

Os pais são desafiados a mediar esta apropriação e utilização digital dos filhos, navegando nesse ambiente digital sem qualquer roteiro definido pelas gerações anteriores. Por isso, por vezes, o caminho pode mostrar-se duvidoso e pleno de paradoxos e dilemas, nomeadamente em questões sobre proteção de privacidade e acesso a oportunidades, aprendizagens e atividades lúdicas, experiências virtuais e atividades ao ar livre, conexões mediadas e competências sociais, co-utilização e definição de regras.

A escola não se pode alhear da evolução das tecnologias na sociedade, do seu potencial nas aprendizagens das crianças, assim como do seu papel em promover competências que serão necessárias no futuro das crianças. No entanto, alguns docentes encaram-nas ainda como uma barreira, faltando-lhes confiança nesta utilização para e com as crianças.

Pretende-se com este ebook refletir sobre a utilização de tecnologias por crianças mais jovens, até 8 anos, em contexto familiar e na escola, na presente sociedade. Que desafios? Que caminhos?

Assim, juntámos vários investigadores, académicos e especialistas na área das tecnologias digitais e crianças. Os autores dos capítulos são de vários pontos do mundo, desde o Brasil, a Croácia, a Espanha, os Estados Unidos da América, a Finlândia, a Grécia, Israel, a Lituânia, Portugal, o Reino Unido e a Turquia, o que revela a importância, a atualidade e a necessidade de investigação e reflexão sobre a utilização de tecnologias digitais por crianças mais jovens. As temáticas exploradas vão desde a família, à segurança digital, aos IoToys, à participação das crianças, à mediação

parental (digital), à dependência, às tecnologias como promotoras de aprendizagens, à robótica e à formação docente, sendo o tema transversal as crianças e as tecnologias digitais. A maioria dos estudos apresentados são qualitativos, alguns são quantitativos ou seguem o método misto, e outros ainda consistem em revisões teóricas. Participaram nos estudos pais, docentes e crianças.
Este ebook destina-se a famílias, a tutores, a docentes e a todos os interessados nestes temas. Esperamos contribuir para a reflexão sobre a utilização de tecnologias digitais por crianças mais jovens, tentando delinear um caminho melhor para todos.
Agradecemos a todos os que contribuiram para este ebook.

Palavras-chave: sociedade da informação; famílias; escola; crianças até 8 anos; práticas digitais.

Current day society is deeply distinguished by the integration of digital technologies in our lives. using them in their daily routines and looking for endless entertainment. These devices are the contemporary "magic wands", capable of supporting children in entertainment, exploring their interests and curiosities, in simulations and even in socializing. On the other hand, children are exposed to online risks, such as inappropriate content for their age, collection of data for commercial exploitation, invasion of privacy and contact with strangers. The "digitisation" of childhood and the unprecedented rapid pace of technological development present new challenges for the several actors involved in protecting children rights, including parents and schools. Parents of these "digitods" are challenged to mediate this digital endeavor, navigating in an uncharted environment with no prior experiences of their own. Therefore, sometimes the path may be doubtful, especially in questions about privacy protection and access to opportunities, learning and play activities, virtual experiences and outdoor activities, mediated connections and social skills, co-use and definition of rules.
School itself can no longer ignore the evolution of technologies in today's society, it's potential in the teaching process with children, as well as its role in promoting skills that will be necessary in the future.
However, some teachers still see them as a barrier, lacking confidence to adopt them in the classroom.
This e-book is intended to reflect on the use of technologies by younger children, up to 8 years of age, in the context of family and school, in contemporary society. Which challenges lay ahead? What are the best paths forward?
Thus, we have gathered several researchers, scholars and experts in the field of "Digital Technologies and Children". The authors of each chapter represent distinct locations, such as Brazil, Croatia, Finland, Greece,

Israel, Latvia, Portugal, Spain, Turkey, United Kingdom and United States of America, which emphasises the global importance of the subject and need for research on the use of digital technologies by young children. A wide range of topics were explored: family, digital safety, IoToys, children's participation, parental mediation of digital media, addiction, technologies as promoters of learning, robotics, teachers' training and having children and digital technologies as a common feature. Most chapters report on qualitative research, but some of them use quantitative and mixed methods, while others are critical literature reviews. Parents, teachers and children participated in these research projects.

This ebook is for families, caregivers, teachers and educators, and all those interested in the subject. We expect it to be a contribution to inspire thought and reflection on the use of digital technologies by younger children and to try to find the best path for all.
We would like to thank everyone who contributed to this ebook.

Key-words: information society; families; school; 0-8 children; digital practices.

Rita Brito e Patrícia Dias

“YOUNG CHILDREN (2-13) AND DIGITAL TECHNOLOGIES: A CASE STUDY OF LITHUANIA.

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ABSTRACT

The chapter aims at analysing the role of online technologies and digital devices in young children's (2-13) lives. The case study of Lithuania contributes with the new insights about the local context and is a continuation of the Lithuanian part of the European Commission Joint Research Center project "Young Children (0–8) and Digital Technologies". This study builds on the national report presenting findings from the qualitative study on young children and their engagement with digital technologies conducted in Lithuania with ten families with children aged from 2 to 13 years and their parents. The research revealed that most children use online technologies everyday day, but their engagement with online technologies is substantially influenced by their parents' attitudes towards online technologies. Children perceive online technologies as entertainment, relaxation, something they can play with. Parents' views towards the use of online technologies by their children are more diverse. They mediate their children's use of online technologies in different ways.

Keywords: Young children; online technologies; family; digital literacy; Lithuania.

Introduction

This study is conducted in the framework of the JRC's Project ECIT, empowering Citizens' Rights in emerging ICT (Project no. 572), conducted in 2015-2018. ECIT aims at identifying new threats caused by information and communication technologies (ICT) to children and developing recommendations for prevention of the emerging issues through education and community attention.

The pan-European project "Young children (0-8) and digital technologies" included partners from Belgium, Bulgaria, Cyprus, Republic of Croatia, Czech Republic, Denmark, Finland, Germany, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Portugal, Romania, Russia, Spain, Slovenia, Switzerland and the United Kingdom. The observation and analysis protocol were co-designed by the different project partners and was coordinated by the Joint Research Center. Each partner, however, had freedom to adapt the interview protocol and to explore strategies and techniques better suited for the younger children in their sample.

In collaboration with a selected group of academic partners in different European countries, this qualitative study aims at exploring young children and their families' experiences with new technologies. This pilot research generated data to address the overall question: In what ways are children and/or their families empowered by the use of (new) digital technologies? In particular, the following research questions are addressed in this study:

1. How do children (2-13) engage with online technologies?
2. How are online technologies perceived by different family members?
3. How do parents mediate their younger children's use of online technologies (at home and/or elsewhere)? Are their strategies more constructive or restrictive?

The findings of the Lithuanian study contribute to the pan-European project "Young children (0-8) and digital technologies", the final report of which has been already published (Chaudron, 2018). This paper presents an expanded overview of the Lithuanian case with the focus on children aged 2-13 years. Numerous recent studies (Dervin, 2018; Garvis & Lemon, 2016; Marsh et al. 2017; O'Connor & Fotakopoulou, 2016; Stephen & Edwards 2018) show that children go online at an increasingly younger age, with tablets and smartphones highly contributing to the overall online socialisation process. The researchers agree that there is a need to ascertain that children from a very young age are professionally guided how to use smart digital technologies. Many studies that focus on young children and digital technologies analyse online risks (Chaudron et al., 2015; Dias et al., 2016; Livingstone, Mascheroni, & Staksrud, 2018; O'Connor & Fotakopoulou, 2016; Smahelova et al., 2017). Positive experiences which relate to learning new information, enhancing social competencies and identity expressions are deeper researched in the study by Smahelova et al., 2017. No such studies have been conducted in Lithuania so far; therefore, the present case study is relevant both for the general European context and for the reinforcement of local educational policies.

Methodology

The study aimed at providing insights about how young children appropriate and perceive digital technologies, their contexts of use, the factors influencing their digital experiences, in particular family dynamics, as well as the strategies employed by parents to mediate their children's usage of technologies. In total, ten family interviews were conducted, mostly in Kaunas (the second largest city in Lithuania) and Kaunas region, by a group of researchers from Kaunas University of Technology, who talked separately with children and their parents in their homes or other places. The interviews were carried out in May 2017. In most families, both the mother and the father were interviewed.

For the children's part, the data were collected mostly from observations and from the interview generated by the support of the card game and activity book provided by the project coordinators. The semi-conducted interviews of the parents sometimes diverted beyond the sets of questions, thus allowing getting the additional insights and supplementary materials related to the aim of research.

For the sampling procedure, we followed the instructions and documents provided by the European Commission's Joint Research Centre (JRC), coordinating the project. The families were chosen using the purposive sampling techniques, through the contacts of the researchers. We aimed at getting a diverse mix within the sample, with diversity in terms of children's ages and gender and family constitution. In our sample, we had children from 2 to 13 years, although the core of the sample was the families with children aged 7 or 8 years. In total, we questioned 19 children, as the number of children in the families was from 1 to 3. Three families of 10 were extended, including grandparents; one family was a lone-mother family. The income of the chosen families was from medium to high. The researchers thought that it would be difficult to discuss the digital competence in children if the family was not affording to acquire the digital devices, which are relatively expensive in the Lithuanian socio-economic context. The families were chosen after the research team from Kaunas University of Technology received the permission to conduct the research issued by Kaunas Regional Biomedical Research Ethics Committee. All families were identified by the end of April 2017. Interviews took place in May 2017. The research data comes as a part of EC JRC's Project "Young Children (0-8) and digital technologies" (Chaudron et al., 2018)

The sample of children is represented by 'low users' (use a digital device at least once a week), 'medium users' (use a digital device at least two or three times a week) and 'high users' (use a digital device at least once a day). In the families where there were two or more children, they were interviewed together. In one family, there were relatively small children (2 and 3 years old), which allowed us to get an understanding whether children start using digital technologies at an early age. In some interviews, both parents were participating, and in others only one parent per family was interviewed.

The aim of our research was to generate data to address the overall question, in what ways, if any, children and/or their families are

empowered by the use of new (online) technologies. During the interviews, we relied on the protocol of observation and used all the provided tools. The beginning of the interview with children was page 10 of the INSAFE activity book 'Play and learn: Being online'. The children were asked to fill in the time table activity using provided stickers. It served as an ice-breaking activity in the family interviews. Then the interview was followed by a card game, which displayed digital and non-digital children activities + Smileys. Later on, we passed on apps and digital services logos and icons. This activity helped to identify digital competencies in children.

While interviewing the parents we tried to keep to the research questions, as outlined in the protocol of observation for parents. In some cases, the interviews diverted from the framework of pre-set questions, but the goal of the research was always kept in mind and extra questions allowed the researchers to get more information related to family habits and daily practices with smart devices.

All the interviews were recorded using voice recorders. During the interviews, the researchers also took notes and photos in relation to the setting and available technological devices. The notes were added to the interview material for analysis. After completion of the interviews, transcripts were produced in order to facilitate the process of analysis. The data were coded and the analysis of results was performed. When analysing the data, the researchers searched for patterns or interesting/ unconventional answers in relation to the research questions. Permission to conduct the research was granted by Kaunas Regional Biomedical Research Ethics Committee (No. BE-2-30).

Findings

In relation to the research question how children engage with new (online technologies), the findings revealed different practices and a different level of engagement as well as digital competence of children who participated in the research. Generally, it may be reported that the children were keen on new technologies, but they were not crazy about them. If the family had the free access to a variety of digital devices, it was reported that children got bored over time and preferred doing something else.

On the other hand, the families that kept the children away from digital devices and tried to limit the time spent on them, had the children "saving the money for the tablet" (boy, 8 years), or imagining that "the smart TV belongs only to him" (boy, 5 years).

Another interesting observation was that the younger children (2-3 years of age) got to know technologies at a younger age as compared with children who were 7-8 years of age. Even several years make a difference, as technologies develop so fast. Those who are 8 now got to know the smart devices for the first time when they were 5 or 6. Nowadays, the kids are attracted to these devices from the age younger than 2 years. The most common devices for them are tablets and smartphones of their parents.

Some children (especially those aged 10 to 13 years old) had a profile on Facebook created for them by parents, but they did not use it because their peers did not have profiles either. The only platform they were familiar with and used together with their parents was Skype, usually used for communication with their relatives abroad.

In relation to the parents' perceptions regarding their children's engagement with new technologies, we found out that the interviewed families were relatively strict and had established rules, regarding the time spent on smart devices. Usually they started with the rule that the children were allowed to spend half an hour a day playing games or watching cartoons/ films on YouTube and, when the children grew bigger, the time could be extended to 1 hour a day. Some children obeyed to rules, others protested against them, or simply broke the rules. Grandparents were inclined not to be so strict and allowed the children much more. On the other hand, grandparents, when they got tired from the noise the children made, allowed the grandchildren to play with new technologies, thus finding a way to relax and have a silent break for themselves.

Contemporary parents belong to the new generation which is overwhelmed by technologies and overloaded with information. In the sample of the parents, a tendency was observed that they opposed to excessive use of technologies while trying to bring themselves and their children back to nature. This trend becomes more and more trendy among the young, educated families. Hence comes the popularity of outdoor kinder-

gartens, primary schools which do not allow to bring smart devices into classrooms, and restrictions posed on the usage of such devices at home. Thus, they try to protect their children and oppose to the influences of technologies. As an alternative, they find and suggest their children a great variety of outdoor activities, including sports, travelling, etc. Also, they involve their children into joint activities such as board games, reading of books, playing with the usual toys like Lego, cars, dolls, etc. Many children attend dancing, singing, drawing or are occupied all the day long with a variety of alternative activities.

In relation to the research question how new technologies are perceived by the different family members, it was reported that the children perceived online technologies as entertainment, relaxation, something you can play with.

Internet has become an inseparable part of their lives. Children do not imagine their daily routines and entertainment without new technologies. On the other hand, we also found out that even if children could be considered as high digital users but if they were not acquainted with the gadget, they expected it to perform only the traditional functions, e.g. to know the exact time.

Some children (especially those aged 10 to 13 years) were aware of online threats and security problems. They reported being afraid to give away personal information to strangers and said they learned about this in the instructions of online games. For the games which are paid they had to ask for parents' permission or ask them to buy the game they wanted. The majority of the children were aware of health risks if they played too long, but this fact, in most cases, could not force the child themselves to stop using the tablet without parents' control. Some children were also aware about the risks related to private data. They knew that they should never disclose the personal details while playing computer games or communicating to someone on the net. Parents seemed to be sure that their young children were safe as long as they observed what their children were involved in and as long as they kept control on the time spent online. Technologies also help to learn the languages, especially when watching movies.

In terms of parents' perceptions, the technologies were considered a good learning tool. Parents generally perceived technologies as positive and educational. The positive results were seen especially in the case of young children. The mother of two small boys (boy, 2 years, and boy, 3 years) noticed that the children learned new words, the names of colors and many other things from watching educational videos on the tablet.

Parents see a lot of advantages in the use of technologies. They thought that their children would not have problems in the future working on the computer and that without special training the children, even very young ones, were smarter than older generation. Technologies were also seen as an integral part of an educational process and development. Parents

reported understanding that their children grow up in a different environment and forbidding using technologies may even result in mocking or insulting as other children at school would become more digitally competent. Parents see the use of technologies by children as normal progress and they do not want their children to lag behind.
In relation to the research question on how parents mediate their children's use of (online) technologies, the parents reported to be relatively strict in following how the children observe the rules. The number or ownership of gadgets in the family did not affect the time children were allowed to spend playing or watching. Parents controlled the time quite strictly mostly due to health reasons (possibly worse eyesight, psychological fatigue, etc.). Thus, it may be assumed that parents are restrictive and actively control what the children are involved in while being online. In some cases, parents reported that their children tried to negotiate when asked to stop watching YouTube because of curse words used in videos recorded by amateur teenagers. The children still wanted to watch, but offered to turn off the sound and still watch.
Families are relatively strict about the time their children spend on smart devices. Only two families allowed their kids to spend up to 3 hours with the tablet or computer, one family had restrictions up to 2 hours and the rest 7 families limited the time spent on smart devices up to 1 hour or less, up to 30 min for kids who were 3 years of age. None of the interviewed families allowed their children to play games or watch videos/films/cartoons without any restrictions. Some parents reported that if they did not set the rules, their children could spend all the day long sitting and watching smart TV. Other families commented that children got bored themselves after some time spent online and got to do something else. The findings also indicated that most of the children were attracted by outdoor games and activities, many of them liked playing Lego or simply did not have enough time to use online technologies a lot, as they were occupied by a variety of extra-curriculum activities, mostly going in for sports, or going dancing, singing, drawing, etc.

Limitations of the study

One of the factors the results are like this could be the similar level of education, income and a way of life in most of the interviewed families. If the sample included families with low digital skills or those living in rural areas, or having low income, the results would be quite different as probably the majority of such families could not afford to have so many devices with online technologies available at home. Besides, a larger sample could provide more reliable and valid results, but the research followed the unified methodology designed by project initiators at the JRC (see Chaudron, 2018).

Conclusions

The findings of the study contribute to the general European report (see Chaudron, 2018). In the case of Lithuania, a number of trends were observed. Most children use online technologies everyday day. They engage with YouTube mostly, watching videos, movies, cartoons, music, etc. However, children's engagement with digital technologies is highly influenced by their parents' attitudes towards technologies, but also by their daily use. Kids watch and learn from parents, but also from their peers, friends, and YouTube tutorials. Watching videos/films/cartoons from YouTube and playing Minecraft are the most popular online activities among the children. Children do not tend to use any social media platforms, such as Facebook, e-mail or instant messaging applications.

Children perceive online technologies and the use of smart devices as entertainment, relaxation, something you can play with. Parents' views towards the use of online technologies by their children are more diverse: some of them are positive and consider online technologies as normal progress, meanwhile others are concerned about possible health and security issues. What concerns online risks as they are perceived by children, some are aware of the risks using online technologies, especially, those related to health, but many children are not yet aware of the risks and threats the Internet can cause.

Several factors affect young children's uses and skills of digital technologies. These may include family constitution, family and parental styles, daily routine, and even the kindergarten or school they attend offering them a number of extracurricular activities. The research revealed that the older children in the family take the lead in using the technologies and smart devices, whereas the youngsters very often act as observers and do not show much initiative to do something on their own. Parents also mediate their children's use of online technologies in trying to limit the time spent on online technologies.

The findings of this case study open up possibilities for further research with larger more diverse samples leading to more reliable research outcomes.

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LEARNING FROM SCREEN MEDIA IN EARLY CHILDHOOD: A DOUBLE-EDGED SWORD

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ABSTRACT

The present study aims to examine the long-term process of learning from screen in early childhood in the child's familial environment. Specifically, it focuses on the process of screen-aided acquisition of a second language by a young girl (here called Dana) who was 12 months old at the beginning of the study and three years old towards its end. The family was selected for in-depth analysis because of the great emphasis that Dana's mother placed on use of touchscreen media to support her daughter's learning of English. First and foremost, the research findings demonstrate the limitations of this use, especially when it is not accompanied by appropriate parental mediation. The study shows that use of a smartphone for learning purposes without the mother's instructive mediation was barely able to advance Dana's English acquisition that was limited to phonetic elements only. Moreover, the findings reveal that with her mother's encouragement, Dana acquired highly problematic smartphone use habits that could be harmful to her health and development. Hence, the research findings call for increasing media literacy among parents of infants and toddlers who need to know how to support the development of appropriate media habits among their young children.

Key words: infants and toddlers, early childhood, second language learning, touchscreen media, smartphone, parental mediation.

Introduction

As the oldest electronic device in young children's lives, television is the most widely studied screen medium regarding the learning potential of screen viewing in early childhood. The extensive literature of the past few decades shows that television could contribute to advancing cognitive development in early childhood, if the screen content is adapted to the cognitive skills of young viewers, such as emphasis on animals and young children, slow-moving objects, female-voice narration and a simple and didactic plot (Christakis, 2009; Lemish, 2015; Linebarger & Walker, 2005). This being said, up to age 30 months, toddlers better understand new material when it is explained to them by a real person rather than by a screen figure. This phenomenon is known as screen deficit and is explained by infants' difficulty to "translate" two-dimensional information on screen to its three dimensional representation in life (Barr, 2013).
One essential means of reducing young children's screen deficit is parents' instructive mediation, aimed at providing explanation and interpretation of the images, situations and behaviors they see on screen (Pempek & Lauricella, 2017). Accordingly, for infants and toddlers, parental mediation can turn television into a "talking picture book" (Lemish & Rice, 1986), if parents carry out deductive activities that while viewing (Lemish, 2015; Strouse, O'Doherty, & Troseth, 2013).
With regard to W∑∑from touchscreens in early childhood, initial empirical evidence indicates that interaction with adults can take place through the screen as well. For example, in an experiment that examined two-year-olds' language learning via tablets, it was found that the toddlers succeeded in doing so when there was interaction between them and the on-screen actor (Kirkorian, Choi, & Pempek, 2016). Another experiment conducted among children aged 2½ to 3, that examined learning a new activity, indicated that when toddlers were given instructions via the interactive screen content, they succeeded at the objective in a manner similar to toddlers who received the same instructions from a live actor (Lauricella, Pempek, Barr, & Calvert, 2010).
Despite its contribution to better understanding touchscreens' learning potential among young children, the current literature displays several substantial limitations. First, most of the studies were carried out among children at the upper bound of the toddler age group and none addressed touchscreen learning by children under age two. Second, these studies pointed only to the touchscreen learning potential examined under laboratory conditions, indicating nothing about long-term screen learning in the children's natural environment. Finally, instructive mediation was conducted by actors, who followed researchers' instructions regarding specific mediation to be carried out. As such, we lack empirical data regarding the manner in which parents fulfill this role spontaneously in everyday life.

One pioneer study on this topic is ethnographic research that observed a family with two children, aged two and four, over an eight-month period (Nevski & Siibak, 2016). The study documented how the two-year-old toddler was using touchscreens to learn a second language with her mother's support. However, the study lacks any indication of how the child's digital activities were mediated and does not specify the frequency and duration of such mediation. Moreover, the study results did not stipulate whether touchscreen use actually engendered or facilitated language learning, nor are we aware of whether and how the toddler used the touchscreen without parents' help.

The present study attempts to fill gaps in the literature by being the first to examine the long-term process of learning from the screen in early childhood in the child's familial environment. More specifically, the research objective was to examine the evolving media habits and preferences of a baby girl (here called Dana) over a period of two years and her mother's screen-related practices and mediation efforts aimed at encouraging Dana's acquisition of a second language by facilitating her media exposure.

Methodology

The methodology selected for this research is based on a case study of one family that allows in-depth comprehension of a unique social phenomenon from a holistic perspective (Stake, 1995; Yin, 2014). The family belongs to a sample of ten families with infants aged 4-12 months at the beginning of the study and 28-36 months by its end. Research was conducted in Israel between 2016 and 2018. The family on which the present article focuses was selected for in-depth analysis because of the great emphasis that Dana's mother placed on use of screen media to support her daughter's learning of English as a second language. Dana's parents are in their early forties, with academic degrees and white-collar professions. At the outset of the study, there were three children in the family (10, 7 and 1 year old).

The study continued for two years and included six observations (each lasting three hours), conducted at the family home every four months. Furthermore, when Dana was 30 months old, one observation was held from 8:00 AM until 9:00 PM in "a day in the life" format (see Gillen et al., 2007). All observations were filmed by video and documented by protocols that contained detailed descriptions of all Dana's media-related behaviors, as well as her interactions with family members. Additionally, in-depth interviews were conducted with Dana's mother every half year, for a total of five interviews. The research was approved by the research ethics committee of the institution where it was conducted. Dana's parents signed a consent form prior to the study and agreed to film Dana in all observations. The video content collected during the study is stored on a password-protected hard disk with the first author having exclusive access to these data.

Thematic analysis was applied to transcripts of the interviews and observation protocols as is customary in qualitative research (Lindlof & Taylor 2002; Strauss & Corbin, 1990). The principal themes that emerged from our reading of the research materials were Dana's uses of different media devices, her media-related skills and changes that occurred over time, Dana's mother's attitudes towards media's positive and negative effects on children's development, her mediation efforts and her uses of media as a parenting tool. The themes were further refined and exemplars of quotations from the transcripts and protocols selected to demonstrate our underlying arguments.

Findings

From the outset, most of Dana's media uses concerned learning English as a second language. Accordingly, the findings presented below are divided into two distinct developmental periods: The first traces Dana's media use from ages 12 to 18 months—a period during which children learn one word at a time as an object label or as a holophrase, wherein one word transmits a more complex meaning ordinarily represented by a phrase. The latter period is characterized by Dana's continued learning of English at ages 1.5 to 3 years, when children acquire language at an accelerated pace and display symbolic thinking (DeHart, Sroufe & Cooper, 2000). These two periods also differ in terms of motor development, enabling more varied and independent use of media, particularly touchscreens) Bedford et al., 2016). The findings will be presented chronologically, with an effort to depict the development of Dana's media habits and her progress with English acquisition as accurately as possible.

12-18 months: First encounter with second language

Dana's screen-assisted language learning already began at the age of one year, at which time Dana was taken care of by her mother, who was running a business from home. Under these circumstances, the mother often used television to keep Dana busy. Consequently, Dana would watch infant-oriented programs for 2-3 hours straight, with her mother checking on her for periods of a few minutes each time. At that time, Dana's viewing menu consisted primarily of Hebrew programs, with one exception—a musical series entitled *Rinat in English Land*. In an interview, the mother said that she herself had difficulty with English and consequently considers it essential that her children master this language. Accordingly, she decided to exploit screen media to support their English learning, as can be seen in the following quotation, referring to her positive experience with her eldest son and her current attempts to provide the same conditions for Dana:

> *[When my son was younger], I introduced him to English through television programs. Wherever I could "stuff in" [some English], I did so, because English*

is really important. Today, I feel that he has an easy time with English [at school]. I believe that children may learn from screens. This is why I play Rinat in English Land DVDs for Dana. What's more, when I put on an English-language film for the boys, Dana joins them too (from the interview conducted when Dana was 12 months old).

As Dana approached the age of 16 months, the mother decided that one day a week, she would watch only English screen content, since she began displaying obvious signs of having learned vocabulary from the programs she watched in Hebrew. Accordingly, the mother hoped that Dana would be able to learn foreign-language words with the same degree of success:

Dana began to speak and is learning words from the programs [in Hebrew]. That's why this is the right time for her to learn English… One day a week, I put on animated songs that teach colors and shapes. I put the first one on and it goes on to the next automatically (from the interview conducted when Dana was 16 months old).

At the age of a year and a half Dana began to say English words she learned from the programs she'd watched, with her mother encouraging her by asking her to translate words from Hebrew to English, such as "What does 'dog' mean?" It is important to emphasize, however, that this mediation was accomplished mostly during the mother's performance of household chores and not during focused viewing together with Dana.
Another development of no less significance was Dana's increased use of her mother's smartphone. Her interest in this device actually began earlier (at about age 14 months), but her mother objected strenuously, defining a smartphone as a tool to be used for her own work purposes only. Within a short time, however, the mother's objections declined in intensity and the device began to occupy a key role in Dana's media experience, primarily as a means of watching animated clips in English that her mother selected on YouTube:

What guides me is selection of educational programming for her [viewing]. When I need time for myself, I put on children's songs from YouTube, but only those that can teach her English. She understands and repeats words like "round" or "elephant" (from the interview conducted when Dana was 18 months old).

A similar pattern was evident during our observation. At 6:00 PM, when Dana began showing signs of tiredness, her mother put an English animated clip on her smartphone and left the living room to perform household chores. Dana sat there quietly and watched a clip of the popular children's song *The Wheels on the Bus*, followed by similar animated songs

her mother put on the playlist. Dana was glued to the screen for about 20 minutes and sought no contact with her mother. The entire time, as far as Dana's mother was concerned, her daughter's use of the device achieved two goals simultaneously: Language learning and amusement, so that her mother would be free to perform other tasks.

20-36 months: In bed with the smartphone

At about age 20 months, Dana became more independent and energetic, as her mother noted: "It is more and more difficult to keep her busy without the smartphone". During our observation, Dana sat alone in the living room and watched animated songs in English for about 40 minutes, while her mother was in the kitchen. From time to time, Dana's mother had to help when Dana unintentionally pressed the screen and paused the clip. As soon as the problem was solved, the mother returned to the kitchen without relating to the content watched.

From age two, Dana's use of the smartphone became almost entirely independent. Dana's mother taught her how to skip ads and Dana learned to select clips for viewing all by herself. At this age, it was evident that television had ceased to interest Dana almost entirely, with most of her attention directed towards the smartphone. During an interview, her mother even emphasized that she attempts to persuade Dana to watch television, but with no success. By contrast, Dana was willing to watch "virtually anything" on the smartphone (said her mother). As such, Dana's mother exploited her daughter's craving for smartphones by increasing her exposure to YouTube videos in English.

The mother also used the smartphone extensively for parenting purposes, as she realized that the device makes it very easy for her to handle her daughter. The most common situation in which the mother needed the smartphone to take care of Dana was before bedtime. During our observation, we found that Dana would watch clips on a smartphone for about half an hour before falling asleep, with the "digital babysitter" a substitute for a parent's bedtime story. Thus, Dana lay in her bed in the dark, with the device placed horizontally (while the content was screened vertically) at a distance of 10 cm. from her face. Moreover, the clips were played at particularly high volume and included glaring colors and fast cuts from shot to shot. All this time, Dana was completely alone, while her mother entered the room only once, to take the phone after Dana fell asleep. In an interview, the mother attempted to justify this practice, claiming she believes that the time just before sleep, when Dana is alone in her room, is most effective for language learning.

At age 30 months, Dana had already learned to recite her favorite songs: *Five Little Monkeys* and *The Wheels on the Bus*. In an interview, the mother expressed great satisfaction with Dana's progress:

I am very satisfied that Dana is already learning songs in English. […] She does not complain when it's time for me to do other things [because she is watching videos on a smartphone] and what's more, she's learning something as well. I expose her to a new language instead of sitting and teaching her myself. I simply place the content before her and she takes it in and learns it on her own (from the interview conducted when Dana was 30 months old).

This quotation expresses the mother's belief that it is sufficient to create an English-language background around Dana so that learning takes place "on its own," without the mother's having to support the process actively. At the age of 30 months, however, Dana's knowledge of the English language appeared to be mostly phonetic: She knew how to recite short songs of up to seven words and to say the names of about 20 objects, animals and colors, but without knowing what most of them represent in reality and without using these words in their proper context.
Towards the end of the study, when Dana was three years old, she began to express overt objection to her mother's choice of English programs, displaying a preference for programs in Hebrew. During the observation, we noticed that the moment the mother chose a *Peppa Pig* episode from YouTube, Dana switched to a Hebrew program as soon as her mother left the living room. At around this same age, the mother began noticing disparity between Dana's extensive exposure to programming in English and her relatively poor knowledge of this language in practice. When asked about the reasons for this disparity, that the mother described in terms of "disappointment," she first mentioned the difficulty of providing Dana with instructive mediation to support her language learning:

I have no way of speaking English to her at home. It isn't natural. I did everything I can do with the means I possess… She watched these clips many times, but didn't learn from them. […] What I taught her [myself] is what stuck and what I didn't teach her, she does not know. This disappoints me because I expected more. The younger children are, the more their brains could absorb, but she didn't (from the interview conducted when Dana was three years old).

The last interview with the mother thus reveals the transformation she underwent. During almost two years of the study, the mother expressed an optimistic belief in media's almost unlimited ability to serve as an effective resource for her daughter's learning the English language, without necessitating parental investment of time and effort. Towards the end, however, the mother had realized that Dana's "failure" attests to the absence of her mother's instructive mediation and active engagement in Dana's viewing.

Conclusions

The case presented here reveals the complexity of using screen media in early childhood as a resource for learning a second language in the family context. Most importantly, this case demonstrates the limitations of this use, especially when it is not accompanied by appropriate parental mediation. The study's findings show that use of a smartphone without the mother's instructive mediation was barely able to advance Dana's acquisition of the English language, that was limited to phonetic elements only. In other words, Dana's learning process lacked "scaffolding" (Vygotsky, 1978) on the mother's behalf aimed at enhancing the child's cognitive abilities in general and the development of language skills in particular.

Moreover, the findings show that with her mother's encouragement, Dana acquired highly problematic smartphone use habits (e.g., long bedtime viewing of loud clips with fast cuts and blinding colors) that could be harmful to her health and development. Hence the research findings call for increasing media literacy among parents of infants and toddlers who need to know how to support the development of appropriate media habits among their young children.

Finally, we would like to thank Dana's parents, especially her mother, who opened their home and hearts to us and allowed us a rare glimpse into the life experience of a contemporary family in which an infant is born into a wide variety of media and content and is constantly exposed to new digital formats and learning options. We wish to emphasize that our analysis does not seek to blame Dana's mother for misuse of media with her daughter. On the contrary, this case reveals the complexity of parenting in the digital age and calls for more studies that would shed light on modern parents' everyday life constraints and dilemmas.

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DEFENDING CHILDREN'S RIGHTS MINDING CHILDREN'S PRIVACY AND DEVELOPMENT IN LIGHT OF THE GENERAL DATA PROTECTION REGULATION

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Abstract

The law has always recognized children's special needs for protection. Children are vulnerable also in relation to the processing of their data, since they are less aware of risks emerging from data processing. The new General Data Protection Regulation (General Data Protection Regulation 2016 (EU), GDPR) has strengthened children's safety. Higher transparency standards are now required. Any information offered should be in a clear language that the child can easily understand. The right to be forgotten is reinforced when a child has given her consent to data processing, but later wishes to withdraw this consent. Children's rights and freedoms may override the interests of the controller and could render processing unlawful. Minors below the age of 16 can consent only via a parent. This chapter focuses on challenges posed by the new GDPR (General Data Protection Regulation 2016 (EU)) and on potential benefits for children's rights to data protection.

Keywords: GDPR, children, data protection, consent, right to erasure.

1. Introduction

Children enjoy a fundamental right to freedom of expression (United Nations Convention on the Rights of the Child 1989 (UN), Article 13) and a right to education (United Nations Convention on the Rights of the Child 1989 (UN), Articles 28, 29) as well as a right to development (United Nations Convention on the Rights of the Child 1989 (UN), Article 6) and a right to privacy (United Nations Convention on the Rights of the Child 1989 (UN), Article 16), rights protected constitutionally in most European, and other, countries. As firms and organizations process a huge volume of children's personal data, whose lives have become increasingly datafied (Lupton & Williamson, 2017, p. 781), the interplay and the balancing of these rights has become increasingly strenuous in the current digital world.

Children may benefit from all digital services offered to enhance their creativity, participation, interaction, or self-expression, but they are also threatened by "digital risks" emerging from (to name but a few) cyber-bullying, targeted advertisements or hateful speech (Palfrey, Sacco, & Boyd, 2008, p. 17). Parents tend to, covertly or overtly, monitor children's behavior (Livingstone & Helsper, 2008, p. 589) or control on their online activities. Innovative technologies allow and encourage parents to engage in such monitoring (Family Online Safety Institute, 2011, p. 3-4; Kirwil, 2009).

Existing tools empower parents to set limits with regard to time spent online, content visited, or services offered (Family Online Safety Institute, 2011). Mobile apps, promising "continuous connectivity", are designed for parents to track whereabouts of their children. The so-called "Quantified Self", i.e. any individual engaged in self-tracking of any kind of biological, physical, behavioral, or environmental information (Swan, 2013, p. 85-86), renders bodies transparent and calculable: via an application human behavior, e.g. sleeping patterns or how many steps one walked, may be measured, managed, and monitored even more deeply. However, data distribution on the Internet allows remote-tracking of others' data, which leads to a "Quantified Otherness", in which others are approached through data (Gabriels, 2016, p. 176). Smart applications, such as 1TopSpy (FAQs – 1TopSpy Cell Phone Spy App, 2014), secretly record SMS messages, Call history, Contact list, Web visited history, or Applications usage history, and track GPS location of the phone in real time. The target-phone holder is unaware that the application is installed and, as no response or participation is required, parents may control children without any interaction.

Since technological developments reflect what society values, such applications can be regarded as leading examples of the contemporary desire for "truth-making machines" (Gregg, 2013, p. 307). Many "tracking-tools", like Life360 (https://www.life360.com/), are offered free of charge. The endless capabilities of digital technology monitoring raise the question of how to better protect children's rights in relation to their data.

2. The GDPR and children's data processing

The Data Protection Directive (DPD, Directive on the protection of individuals with regard to the processing of personal data and on the free movement of such data 1995 (EU)) did not mention the word "children" and, hence, treated both adults and children equally. However, as children became avid users of technologies (Article 29 Data Protection Working Party, 2013, p. 26), attention was drawn to strengthening their right to personal data protection (Article 29 Data Protection Working Party, 2009, p. 2). After having recognized minors' vulnerability (Article 29 Data Protection Working Party, 2010, p. 17), decision-makers accepted that children are less aware of risks and they, hence, merit specific protection that should, in particular, apply to use of data for the purposes of marketing or creating profiles (General Data Protection Regulation 2016 (EU), Recital 38). So, higher transparency standards are required and, for instance, any information should be in plain language that children can easily understand (General Data Protection Regulation 2016 (EU), Recital 58, Article 12(1)).

A child is every human being below the age of eighteen years, unless she has acquired legal adulthood before that age (Article 29 Data Protection Working Party, 2009, p. 3; United Nations Convention on the Rights of the Child 1989 (UN), Article 1). But defining a child so broadly could negatively impact older children's rights and, in particular, their ability to access the Internet and express themselves freely (Montgomery & Chester, 2015, p. 289). Indeed, children are in a special situation that could be seen from a static and a dynamic perspective (Article 29 Data Protection Working Party, 2009, p. 3): they are persons who have not yet achieved physical and psychological maturity (static point of view), and they are in the process of developing physically and mentally to become adults (dynamic point of view) (Article 29 Data Protection Working Party, 2009, p. 3). Under the GDPR, the European legislator took such concerns into account and made clear that when "information society's services" are offered "directly" to a child, personal data processing is lawful when the child is at least sixteen years old –and has given consent– while, where the child is below that age, consent must be given by the holder of parental responsibility (General Data Protection Regulation 2016 (EU), Article 8(1)). An "information society's service" is defined as any service normally provided for remuneration, at a distance, by electronic means, and at the individual request of a recipient of services (General Data Protection Regulation 2016 (EU), Article 4(25); Directive laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services 2015 (EU), Article 1(1)(b)).

As payment is a condition in this case, one could question whether advertising services, services provided by non-profit (e.g. educational) organizations, or in general all "free digital services" (e-mail services etc) are included in the list. Moreover, these "information society's services" are required to be offered "directly" to a child, but it is not very clear

whether these refer to services that are targeted to children (like Facebook's "messenger kids": https://messengerkids.com/) or to those that are offered on a daily basis (such as the very Facebook itself). Further uncertainties concerning harmonization could emerge, as Member States may provide by law for a lower age, provided that it is not below thirteen years (General Data Protection Regulation 2016 (EU), Article 8(1)). Hence, different age thresholds can be set by national laws. Given the complexities of the digital environment, which question parents' capacity to make better decisions than their children (Hof, 2016, p. 434), a high age threshold could pose risks, putting too much responsibility in the hands of those who are not always familiar with technologies. There are no exceptions with regard to parents' consent (unless children's data is processed in the context of preventive or counseling services offered directly to the child; General Data Protection Regulation 2016 (EU), Recital 38), which could lead to excessive parental interference or even breach of children's right to privacy (Hof, 2016, p. 440) and to development: to provide informed consent, a parent should become aware of the child's online activities; to become aware, parents would need to monitor and track minors.

While it is recognized that the right to erasure is crucial, in cases where a child has given her consent, but later –when no longer a child– wishes to waive this consent and remove her data (General Data Protection Regulation 2016 (EU), Recital 65), however, the provision (General Data Protection Regulation 2016 (EU), Article 17) that reinforces the right to erasure makes no reference to children. So, exercising this right may not always be straightforward in practice (Blume, 2015, p. 262).

Although decisions based solely on automated processing should not concern a child (General Data Protection Regulation 2016 (EU),Recital 71), the "profiling article" (General Data Protection Regulation 2016 (EU), Article 22) mentions nothing in relation to the specific protection that children merit. Additionally, even though the above children's rights and freedoms may override interests pursued by the controller and could, thus, render this processing unlawful (General Data Protection Regulation 2016 (EU), Article 6(1)(f)), how data controllers will undertake balancing tests in practice remains uncertain.

3. Parents' monitoring vs. minors' rights

Raising children with access to the Internet is a –relatively– new phenomenon. One could argue that children, who are not yet "in the maturity of their faculties" (Mill, 1859, 2001, p. 54), could or should be treated paternalistically. To some, parents are the most important guardians of children's welfare, as they are deeply concerned about the impact that technologies may have on minors (Kaiser Foundation, 2004, p. 12; Livingstone & Bober, 2006, p. 93). They would ensure that their children would "jump" into a swimming-pool only after having learnt how to swim (Byron, 2008, p. 107). Similarly, they would ensure that their children would not be harmed in the digital world.

Parental control is, to a large extent, necessary to direct children to adulthood. Some have described this parents-children relation as the "archetype of responsibility" (Jonas, 1984, p. 130). Children, when poorly monitored, may be more likely to express antisocial or criminal behavior (Stattin & Kerr, 2000, p. 1072) and parents' involvement could establish the rules necessary to facilitate communication (Stattin & Kerr, 2000, p. 1082). However, the active role and the participation of minors themselves should also be clearly acknowledged.

Early adolescence can be understood as a stage, in which teenagers strive for autonomy and self-determination, as a transition period to prepare for separation from parents, to become self-reliant. In this phase, minors tend to avoid parental control (Barron, 2014, p. 408) and they want the right to be ignored by those whom they see as being "in their business" (Boyd, 2014, p. 55). So, early teens not only disobey –to negotiate or alter– parents' rules (Fleming, 2005, p. 13) but also make decisions autonomously.

Autonomy, in the context of informational privacy, requires that individuals are "rational project pursuers" (Moore, 2003, p. 215) and choosers (Benn, 1980, p. 60) who steer their course through the world. To be a person, an individual must recognize not just her actual capacity but also her exclusive moral right to shape her destiny by her choices (Reiman, 1976, p. 39).

Although it could be claimed that teens lack this moral autonomy, which mainly refers to adults (Scarre, 1980, p. 123), albeit, children do not turn miraculously into grown up persons. They, thus, need to enjoy certain rights depending on the level of their maturity and the capacity to independently make reasoned choices. As emerging persons, they need to have the right to develop, to turn into autonomous agents. To do so, they need privacy; the ability to see themselves as autonomous, to learn that they are capable of controlling when and by whom the thoughts in their head will be experienced by someone other than themselves, and to learn that they are entitled to such control and that they will not be forced to reveal the contents of their consciousness even if they put such

contents on "paper" (Reiman, 1976, p. 43).
Intimacy is crucial in this context. To be friends or lovers, persons need to be intimate to some degree with each other. There is a need to share information about one's actions, beliefs or emotions that one does not share with everybody and that one has the right not to share with anyone; by granting this right, privacy creates "moral capital" that is "spent" in friendship and love (Gerstein, 1970, p. 89).
In the children-parents relation, the above means that the child should enjoy privacy to exercise the right to development and become intimate with her parents and with others. If a minor were completely disallowed to keep her own secrets or share secrets with those she would wish, she would not be able to create relationships or learn how friendship work and would not be able to develop.

4. A children-friendly interpretation of the GDPR

The GDPR's parental consent prerequisite supports a "paternalistic argument": Parents must protect children from harm as minors face risks online. Information about their online behavior is needed to protect them and, so, monitoring is good to get this information and necessary to give informed consent. Therefore, parents should monitor online activity.
Monitoring, however, as a paternalistic action, intends to remove or restrict the choice of a person (Clarke, 2002, p. 82). When it comes to children's privacy, it would be fair to argue that such practices should not always be acceptable.
Digital risks are in some cases overstated, while monitoring can be ineffective, as one cannot infer someone's beliefs from mere information. Namely, a minor may read a racist text but this does not always mean that she shares the author's views. Moreover, monitoring may harm in other cases, such as where unreasonably conservative parents would completely restrict their minor's freedom, if they found that he was gay. Besides, covert monitoring, if discovered, could undermine trust, while overt monitoring would be a clear message that the parents do not trust their child.
There is, it follows, a need for reciprocity, mutual respect and trust that would encourage minors to become media educated, instead of app monitored. Perhaps, parents and children should engage in democratic negotiations, share online activities, and talk more about the Internet. And, in our view, the GDPR does offer the provisions necessary to render minors beneficiaries of the data-driven reality. The principle of data protection by design and by default (General Data Protection Regulation 2016 (EU), Article 25) could oblige firms to introduce different default settings for children. Since firms should evaluate the risks inherent in data processing and implement measures to mitigate them (General Data

Protection Regulation 2016 (EU), Recital 83), a data protection impact assessment could be conducted (General Data Protection Regulation 2016 (EU), Article 35) when minors' data is processed. While children's data is not included in Recital 91 of the GDPR, however, it could be argued that, in light of Recital 38, carrying out the above assessment would be a good practice. Furthermore, supervisory authorities could very well perform their role as promoters of public awareness (General Data Protection Regulation 2016 (EU), Article 57) and, hence, encourage digital media literacy. Codes of Conduct (General Data Protection Regulation 2016 (EU), Article 40(2)(g)) could also be introduced to efficiently and effectively provide information and make clear how to "formulate" plain language (General Data Protection Regulation 2016 (EU), Article 12(1)).

Lawyers, data scientists, software designers, ethicists and others should all work together to make information understandable. This way, monitoring would very likely be mostly avoided, the use of tracking-applications would most probably be limited for exceptional situations (to serve goals of benevolence), and parents, when wondering whether their child is threatened by the e-world, would ask themselves questions asked in the emergence of an alleged "offline threat": "Does she study less? Did she quit her friends and activities? Has she become antisocial?" If the answer is "no", monitoring is probably unreasonable.

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PAIS, FILHOS E TECNOLOGIAS DIGITAIS MÓVEIS: PERCEÇÕES DE UTILIZAÇÃO E CRITÉRIOS PARA ESCOLHA DE ATIVIDADES

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Resumo

Pretendemos perceber que tipo de apps os pais consideram adequadas para utilização pelos seus filhos e conhecer a opinião das crianças na utilização de dispositivos digitais móveis. Recorremos aos dados do estudo hAPPy kids, nomeadamente 1968 questionários a pais de crianças até 8 anos e entrevistas a 81 famílias com filhos até 8 anos. Os pais reconhecem o potencial educativo das tecnologias, mas recorrem frequentemente a modelos "tradicionais", como a sua própria infância ou as atividades realizadas em educação formal, para avaliarem as apps como educativas ou não. Preferem que os filhos usem apps que explorem conteúdos escolares mas, ao contrário dos pais, as crianças preferem ver vídeos, jogar jogos de simulação e ação/aventura. As preferências das crianças, e o facto de os conteúdos mobile lhes proporcionarem diversão, não são muito valorizados pelos pais, focando-se no desenvolvimento e na aprendizagem.

Palavras-chave: Apps, crianças 3-8 anos, educação, aprendizagem, pais, perceções.

Introdução

As crianças nascem em lares onde proliferam os computadores, os smartphones e os tablets, e têm contacto com estes dispositivos cada vez mais jovens, utilizando-os nas suas rotinas diárias (Plowman, Stevenson, Stephen, & McPake, 2012).

Os dispositivos móveis touch são os mais populares entre as crianças (Ofcom, 2017), principalmente entre as mais jovens, devido ao interface intuitivo de um dispositivo touchscreen, à facilidade de instalação de novas apps, e à maior portabilidade e autonomia (Falloon, 2014; Neumann & Neumann, 2015).

Os dispositivos móveis digitais, em particular os tablets, podem ter um papel positivo na melhoria de competências de crianças mais jovens, como por exemplo, competências emergentes de leitura, de escrita e matemática (Kyriakides, Meletiou-Mavrotheris & Prodromou, 2016; Neumann & Neumann, 2015), criatividade, expressão ou entretenimento (Livingstone, 2004; Norris, 2001).

Tem havido um aumento explosivo no número de apps auto-proclamadas de "educacionais" destinadas a crianças mais jovens, que estão disponíveis gratuitamente ou por um pequeno valor nas duas lojas online mais populares (Google Play e App Store) (Nadworny, 2017), visando principalmente a faixa etária abaixo de 10 anos. As apps educacionais são definidas por Hirsh-Pasek et al. (2015) como aquelas em que as crianças "são cognitivamente ativas e envolvidas, quando as experiências de aprendizagem são significativas e socialmente interativas, e quando a aprendizagem é guiada por um objetivo específico" (p. 5). Existem mais de 100.000 apps educacionais nas lojas online da Apple e do Google (Dua & Meacham, 2016; Nadworny, 2017). Para permitir um acesso mais fácil a estas apps, a Apple criou uma secção especial na loja digital para essa faixa etária (Judge et al., 2015), onde as temáticas vão desde aprender o alfabeto, contagem básica e operações matemáticas, jogos de memória, leitura de histórias ou quebra-cabeças (Kucirkova, 2014a, 2014b).

Os pais desempenham um papel fundamental na seleção e uso de apps para as crianças quando estas são ainda muito jovens (Brito, 2017; Dias & Brito, 2016, 2017; Rideout & Hamel, 2006). Muitas vezes referidos como gatekeepers na utilização das tecnologias, influenciam o uso destas pelas crianças, estabelecendo um exemplo de hábitos, co-utilizando as tecnologias com os seus filhos, refletindo sobre atitudes e uma utilização segura, ou encorajando a visualização de conteúdos adequados (Dias et al., 2016).

No Reino Unido, os pais incentivam as crianças a fazer download de apps que estimulem a sua aprendizagem, sendo a seleção de apps influenciada pela loja online, o ambiente familiar e os anúncios in-app (Marsh et al., 2015). Para além disso, estes pais encorajam a brincadeira e a criatividade quando as crianças interagem com tecnologias digitais

(Marsh et al., 2015). Pais com filhos de seis meses a quatro anos, que vivem em sítios urbanos, de nível sócio-económico baixo e comunidades de minorias referem que oferecem tecnologias digitais móveis às crianças enquanto fazem "tarefas domésticas", "para as acalmar", "para ser mais fácil fazer o jantar", ou "na hora de deitar" (Pasnik & Llorete, 2012; Kabali et al., 2015). Por outro lado, referiram preocupação relativa à utilização excessiva de tecnologias digitais móveis pudesse levar à obesidade, ao vício, à agressão, à introversão ou à não interação social (Borzekowsi, 2014; Dias & Brito, 2016, 2017, 2018b; Genc, 2014).

No estudo de Vittrup, Snider, Rose e Rippy (2016), onde foram questionados 101 pais de famílias norte-americanas com filhos entre os 2 e os 7 anos, verificou-se que os pais estimulam ativamente as crianças a usar tecnologias devido às suas crenças na importância dessas ferramentas. A maioria dos pais acredita ser apropriado usar tecnologias para entreter os filhos enquanto os adultos realizam outras tarefas, e mesmo aqueles que não concordaram admitiram que por vezes o faziam. Estes resultados podem ser um reflexo dos estilos de vida atuais dos pais e do facto de as crianças terem acesso a mais tecnologias disponíveis em casa.

Devido à idade jovem das crianças a que nos estamos a referir, existem diferenças entre as perceções de pais e crianças sobre riscos relativos à utilização da web. Por exemplo, no estudo realizado por Lim, Khoo e Williams (2003), os pais apresentaram mais preocupações sobre o uso da Internet do que os seus filhos. Além disso, os pais tendem a subestimar o uso indevido de web por parte dos seus filhos, como visitar sites inapropriados. Outros estudos referem que os pais acham que supervisionam o uso da web pelos seus filhos adequadamente, ao passo que os filhos pensam que não são supervisionados (Brito, 2017; Dias & Brito, 2016, 2017). Uma razão plausível para esta discrepância poderá ser o facto de os pais estarem a usar meios não invasivos de supervisão das atividades online dos filhos, ou seja, meios pouco efetivos.

Posto isto, pretendemos com este artigo perceber qual o tipo de apps os pais consideram adequadas para os seus filhos e as suas perceções sobre as práticas digitais destes. Por outro lado, quisemos perceber qual a opinião das crianças sobre utilização de dispositivos digitais móveis.

Os dados apresentados neste artigo fazem parte do estudo hAPPy kids (Dias & Brito, 2018a, 2018b), onde se pretendeu aplicar o quadro teórico de Livingstone (2008) referente a conteúdos online positivos e as atividades da POSCON European Network , às aplicações móveis.

4. Metodologia

Conforme já referido, os dados apresentados são baseados no projeto hAPPy kids. O objetivo final deste projeto é identificar critérios para avaliar e classificar os conteúdos móveis positivos, com o objetivo de criar um modelo teórico de avaliação dos aspetos benéficos das aplicações (uma "escala de positividade"). Pretende-se transformar este modelo numa ferramenta aplicada (online) que auxilie stakeholders, docentes e pais a tomar boas decisões na escolha de aplicações digitais para crianças.
Como ponto de partida para a identificação de critérios positivos, foram recolhidos inquéritos por questionário a pais e realizadas entrevistas a 81 famílias.

4.1 Técnicas De Recolha De Dados

O questionário utilizado foi adaptado do estudo de Wartella, Rideout, Lauricella e Connel (2014), adotando-se o método de "tradução-retroversão" , sugerido por Hill e Hill (2008, p. 81), para gerar uma versão portuguesa deste questionário. O inquérito foi aplicado a uma amostra intencional de pais, com filhos até 8 anos de idade. Os pais responderam ao inquérito através da divulgação online, num portal que agrega conteúdos para pais de crianças destas idades, o Pumpkin (www.pumpkin.pt).
Realizaram-se também entrevistas semi-estruturadas, de natureza mais exploratória. Foi utilizada uma amostra intencional. Este tipo de amostra é não probabilística, ou seja, as famílias não foram selecionadas por meio de um critério estatístico, mas sim de forma "bola de neve". À medida que íamos entrevistando famílias, íamos pedindo que nos referenciassem outra. Este método poderá explicar alguns desvios da amostra, como o facto muitas famílias terem alto rendimento. No entanto, uma amostra intencional não pretende ser representativa, mas sim recolher a maior variedade possível de narrativas e perspetivas sobre o fenómeno em estudo (Courtney, 2017).
O desenho da investigação usa métodos mistos (Tashakkori & Teddlie, 2010), garantindo assim a triangulação dos dados recolhidos (Clark & Creswell, 2008; Creswell, 2003). A análise dos dados quantitativos recolhidos no inquérito por questionário foi descritiva e inferencial, realizada com o software SPSS (Lacort, 2014). Os dados qualitativos foram analisados com recurso ao software NVivo, versão 11.

4.2. Participantes

Recolhemos 1968 questionários, onde participaram 257 pais e 1711 mães, referentes a 804 crianças entre os 3 e os 5 anos e 733 crianças entre os 6 e os 8 anos.
Relativamente às entrevistas, participaram um total de 81 famílias. Mais especificamente, entrevistámos 23 pais e 61 mães, e entrevistámos 88 filhos, nomeadamente 66 crianças de 3 a 5 anos e 56 crianças de 6 a 8 anos.
Para termos alguma informação sobre o estatuto socioeconómico das famílias, questionámos os pais sobre o seu rendimento do agregado familiar. Através do Quadro 1 verificamos que a maioria dos participantes é de estatuto socioeconómico médio.
De referir que categorizámos as crianças que tinham 6 anos e frequentavam a educação pré-escolar como "3-6 Pré-Escolar" e categorizámos as que tinham 6 anos e frequentavam o 1º ano do 1º Ciclo do Ensino Básico como "6 anos - 1º Ano".
Os dados biográficos podem ser vistos em mais pormenor no Quadro 1.

Quadro 1
Dados biográficos dos participantes do estudo.

Dados demográficos	**Questionário N=1965**	**Entrevista N=81**
Pais participantes		
Pai	257	23
Mãe	1711	61
Estatuto socioeconómico		
Baixo	167	1
Médio	1303	60
Alto	496	13
Idades crianças participantes		
0-2	425	-
3-5	804	66
6-8	733	56
Home Schooling (6-8)	7	

Nota: A soma dos pais participantes nas entrevistas excede 81 porque em algumas famílias ambos participaram na entrevista. O mesmo sucedeu nas entrevistas das crianças, em que foram entrevistados irmãos, no entanto o foco foi mantido na criança até 8 anos.

Todos os membros das famílias foram codificados de modo a garantir a sua confidencialidade e anonimato. A codificação começa com um nome fictício, o número da família (F1, F3, F3, ...), seguindo-se o seu relacionamento familiar ou género (f – pai; m – mãe; g – menina; b – menino) e idade.
Por exemplo:

- Rapaz de 4 anos da primeira família entrevistada: João (F1b4).

1. Partindo da reflexão de Livingstone (2008) sobre conteúdos digitais positivos, formou-se uma rede Europeia para a promoção de conteúdos digitais positivos - a POSCON. Foram criados guidelines práticos e éticos para os produtores de conteúdos digitais. Neste âmbito, um conteúdo positivo digital deve (POSCON, 2014) promover a aprendizagem e o desenvolvimento das crianças; ser divertido e proporcionar às crianças entretenimento; permitir a aquisição e retenção de competências; estimular a imaginação; estimular a criatividade; incentivar a participação na sociedade; promover a compreensão multicultural; permitir às crianças descobrir novas possibilidades e capacidades; suportar a construção de relações com a família e amigos; encorajar a expressão da identidade das crianças, bem como o seu sentimento de pertença a uma comunidade; incentivar as crianças a produzir e distribuir os seus próprios conteúdos.

2.Z O processo de "tradução-retroversão" divide-se em três passos: inicialmente o questionário foi traduzido de inglês para português por duas pessoas, em que uma das pessoas era portuguesa e conhecia a língua inglesa e a outra pessoa era inglesa e conhecia a língua portuguesa; de seguida verificou-se esta tradução, e pediu-se a uma terceira pessoa, neste caso uma pessoa inglesa que conhecia bem a língua portuguesa, que traduzisse a versão portuguesa para inglês; por fim, comparou-se a versão original dos protocolos (em inglês) com a versão da terceira pessoa (versão também em inglês), verificando-se que estas eram muito semelhantes, estando portanto a versão portuguesa adequada (Hill & Hill, 2008).

5. Resultados e discussão

Quisemos perceber quais as perceções dos pais relativamente a uma app educativa. Focando-nos nas respostas ao questionário, grande parte dos pais associa a noção de "educativo" aos conteúdos trabalhados na escola e às competências desenvolvidas em contexto de educação formal, mesmo notando que alguns destes pais têm filhos muito pequenos, que não estão ainda inseridos na escolaridade obrigatória. Os pais valorizam bastante o desenvolvimento de dimensões como a leitura, a escrita, a matemática, o inglês, a programação, ou a resolução de problemas, sendo que a que menos valorizam é a construção e expressão da identidade. Para além disso, valorizam bastante outras aprendizagens que não as relacionadas com o contexto escolar, e também a criatividade e as competências artísticas.

Relativamente à tipologia ou formatos que pensam ser mais adequados para apps educativas, os pais respondem em termos mais tradicionais, possivelmente associados à sua própria experiência de infância e/ou aos materiais que estão disponíveis nas escolas com maior frequência. Assim, elegem como formatos favoritos os puzzles, os jogos de construção, e os

jogos com atividades semelhantes às escolares, nos quais também se englobam os jogos de criação artística. É curioso observar que valorizam menos os formatos que são geralmente os preferidos pelas crianças, e também os que mais tiram partido das potencialidades das tecnologias digitais. De facto, o ambiente digital permite às crianças jogar ao "fazer-de-conta", o que sempre foi um tipo de brincadeira fundamental para o desenvolvimento cognitivo, para a aprendizagem e desenvolvimento da identidade e da alteridade, para a aprendizagem e negociação de normas sociais. Jogos de ação ou de aventura, de role-playing e simuladores são descartados pelos pais como menos apropriados, mas na verdade têm grande potencial educativo, para além de agradarem mais às crianças. Pedimos aos pais que estimassem, das apps instaladas no último mês por eles e pelos filhos, quantas seriam educativas, na sua opinião. É notória nas respostas a preocupação dos pais em escolher conteúdos educativos para os filhos. É também interessante que admitam que essa não é, na maior parte dos casos, a escolha voluntária das crianças.

Consideremos agora os aspetos da checklist desenvolvida pela rede POSCON (2014), apresentando requisitos de conteúdos positivos. Observámos que os aspetos que os pais mais valorizam estão relacionados com a segurança das crianças, nomeadamente que a app não invada ou exponha a privacidade das crianças, que a app requeira autorização dos pais para algumas ações tais como compras in-app ou entrada em chat in-app, e que as crianças não sejam expostas a publicidade, que não sejam direcionadas para fora da app, e que não sejam expostas à possibilidade de comunicar com outras pessoas. Os pais valorizam também bastante a adequabilidade dos conteúdos à idade das crianças, embora este seja um aspeto bastante subjetivo, pois o que pode ser adequado para uma criança pode não ser para outra, e mesmo os pais têm perceções distintas sobre o que é adequado. Por exemplo, Dias e Brito (2016, 2017) observaram que algumas crianças ficam agitadas e frustradas com jogos, ao passo que outras conseguem gerir bem esses sentimentos, jogando exatamente os mesmos jogos. Outros aspetos como a marca enquanto garantia de qualidade, aspetos mais técnicos como o interface, a user experience ou o design são menos valorizados pelos pais. Observamos que o facto de a criança se divertir, poder explorar e fazer descobertas é menos valorizado pelos pais do que os aspetos relacionados com a segurança. Estudos anteriores revelaram que as apps preferidas das crianças estão geralmente relacionadas com universos ficcionais e brinquedos de que gostam, como o caso das princesas e da Barbie para as meninas e dos super-heróis ou do Lego para os rapazes (Dias & Brito, 2016, 2017). No entanto, os pais não valorizam este elemento na escolha e eleição de conteúdos móveis para os seus filhos. Por outro lado, e na opinião das crianças entrevistadas, o mais importante nesta utilização digital é divertirem-se, algo que os pais colocam em 8ª posição no que concerne a uma app positiva. As crianças reconhecem também que realizam aprendizagens e gostam dessa conjugação.

I: E achas que é importante aprender quando usas estas aplicações?
Manuela (F18g8): Sim porque estamos a aprender de uma forma mais divertida.

Vários foram os conteúdos mencionados pelas crianças relativamente às suas aprendizagens na utilização destes dispositivos e apps. Foram referidos maioritariamente conteúdos educativos, onde dizem aprender a "fazer umas coisas para a escola, a estudar e a escrever" (Sara, F61g8). O conteúdo educativo mais mencionado foi a matemática, onde as crianças dizem treinar as "contas", a "tabuada" ou os "números". A aprendizagem de inglês foi igualmente muito mencionada porque a maioria das aplicações estão em inglês. Aprendem também a ler e escrever, principalmente com aplicações como o WhatsApp.

Cátia (F46g8): Eu acho que com o WhatsApp aprendemos porque aquilo tem o corretor e por isso aprendemos a escrever.

Ainda relativamente a questões educativas, as crianças referem aprender Português, Ciências e Conhecimento do Mundo. Aprendem também a jogar futebol, a tocar um instrumento ou dança através da visualização de vídeos no YouTube.
Questionámos os pais sobre as práticas digitais mais frequentes dos seus filhos. Os nossos resultados são coerentes com os de estudos anteriores sobre o mesmo tema (Chaudron et al., 2015; Dias & Brito, 2016, 2017, 2018a, 2018b; Ponte et al., 2017), evidenciando que as atividades com maior número de respostas "com muita frequência" são ver vídeos de desenhos animados no YouTube, jogar em apps e "ver vídeos de músicas no YouTube". Segue-se a categoria das apps educativas, que também são bastante usadas pelas crianças. Observamos que os pais são sempre cautelosos na escolha da opção "com muita frequência", isto porque o discurso dominante nos media desaconselha o uso excessivo das tecnologias digitais. Vemos que os pais das crianças pequenas consideram que elas não estão expostas a perigos como o contacto com estranhos, o cyber-bullying e mesmo o abuso sexual porque ainda não estão presentes em redes sociais.
Quisemos também conhecer em maior detalhe as perceções e crenças dos pais relativamente aos efeitos da utilização de dispositivos como smartphones e tablets no desenvolvimento (ou não) de algumas competências por parte dos seus filhos. Observámos que os pais acreditam que há efeitos positivos em termos da aprendizagem da matemática, da leitura, do desenvolvimento da linguagem, da criatividade e da capacidade de concentração. Quanto aos efeitos negativos, os mais sentidos são a desmotivação de atividades físicas, em perturbações do sono, na inibição da sociabilidade, e em aspetos comportamentais. Destacamos ainda que há um número significativo de respostas "não sei", uma média de 20%. Isto confirma que, de facto, os pais têm muitas dúvidas sobre que apps poderão ser benéficas ou prejudiciais para os seus filhos. Existem mais

dúvidas relativamente ao comportamento, à matemática, ao sono e à leitura.
No questionário, os pais referiram igualmente que a utilização de tecnologias digitais é benéfica a nível da matemática, leitura ou criatividade.
Por outro lado, nenhuma criança evidenciou problemas de qualquer ordem por utilizar estes dispositivos, ao contrário dos receios dos pais, como problemas de sono ou falta de socialização. Questionadas sobre como estas atividades nos dispositivos digitais as fazem sentir, a maioria das crianças disse que se sentiam felizes, contentes e divertidas, especialmente as raparigas em idade primária (46%). As crianças sentem-se felizes quando ganham os jogos ou passam de nível. Os dispositivos podem ser uma companhia quando estão sozinhas e as aplicações que elas escolhem dão aso a atividades criativas e divertidas.

Madalena (F53g8): Sinto que mesmo tendo irmãs nenhuma quer saber de brincar comigo e por isso divirto-me sozinha e falo com as minhas amigas.

Contudo, referem que ficam com medo e nervosas quando veem imagens violentas, como crianças a chorarem ou utilização de armas. Ficam tristes e zangadas quando perdem nos jogos, ou quando os irmãos querem mudar de jogo.
Questionámos se as crianças achavam que as apps podiam ser perigosas e mais de metade das crianças que respondeu a esta questão disse que não eram perigosas. Consideram que as aplicações que escolhem são benéficas, como por exemplo o "Minecraft [que] ajuda a pensar" (Hugo, F10b8), ou então porque são de temáticas inocentes, como o futebol, ou então "é só fazer danças, cantar e mandar mensagens e o Instagram se pusermos privado não faz mal" (Cláudia, F72g8). Apesar disso, foram 11% das crianças que disseram que estas atividades digitais podem ser perigosas, sendo que duas referiram ter visualizado conteúdos impróprios. É relevante referir que os aspetos mencionados como perigosos foram apenas mencionados por crianças com mais de 6 anos.

Conclusões

Foi nosso objetivo com este artigo perceber qual o tipo de apps os pais consideram adequadas para utilização dos seus filhos e as suas perceções sobre a utilização digital destes. Pretendemos também conhecer a opinião das crianças na utilização de dispositivos digitais móveis. Para tal, utilizamos os dados do estudo hAPPy kids, nomeadamente 1968 questionários a pais de crianças até 8 anos e entrevistas a 81 famílias com filhos até 8 anos.

As crianças, hoje em dia, começam a usar dispositivos digitais, e principalmente smartphones e tablets, cada vez mais cedo, e os pais desempenham um papel importantíssimo enquanto mediadores destas tecnologias, precisamente nesta fase em que as crianças são menos autónomas e estão ainda a desenvolver as suas competências digitais. O papel dos pais é importantíssimo, mas eles revelam terem muitas dúvidas. Não há precedentes para estes pais, pois eles próprios são a primeira geração que contactou com as tecnologias digitais na adolescência, e são agora confrontados com uma nova geração que já nasce em lares onde os dispositivos digitais são vários e estão integrados nas rotinas das famílias. Os pais reconhecem o potencial pedagógico e educativo destas tecnologias, mas recorrem frequentemente a modelos "tradicionais", como a sua própria infância ou as atividades realizadas em contextos de educação formal, para avaliarem as apps como educativas ou não. Mas avaliar as apps e escolher as que consideram mais benéficas para os filhos é apenas o primeiro desafio. O segundo é motivar as crianças a usarem essas apps, pois as preferências de pais e filhos nem sempre coincidem. Deixados a escolher autonomamente, os filhos geralmente preferem jogos mais ativos, simuladores ou de roleplaying, e muitas vezes relacionados com universos ficcionais de desenhos animados ou brinquedos. Os pais procuram direcioná-los para puzzles, jogos de construção e outro tipo de atividades que trabalhem os conhecimentos e competências trabalhados nas escolas, mas sem a motivação ou acompanhamento dos pais, as crianças acabam por não usar este tipo de apps. É importante salientar que as preferências das crianças, e o facto de os conteúdos mobile lhes proporcionarem diversão, não são muito valorizados pelos pais, que estão mais focados no desenvolvimento e na aprendizagem. Encontrar pontos comuns entre os interesses e objetivos de crianças e pais é fundamental para estimular a co-utilização, que é a forma mais benéfica de mediação parental das tecnologias digitais.

Os pais não podem ser deixados sozinhos neste desafio. Os pais consideram os jardins de infância e escolas como exemplos, e acabam por procurar mimetizar nos lares os tipos de atividades digitais desenvolvidos nestes espaços educativos formais.

Os profissionais de educação podem ir além do exemplo, e serem fontes de informação de referência para os pais, ajudando-os a esclarecer as suas dúvidas e a procurar informação credível e com qualidade.

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MEDIA AND ICT AS PROMOTERS OF SCHOOL READINESS: BELIEFS FROM PARENTS AND YOUNG CHILDREN

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Abstract

The present study aims to explore the results of an educational practice that implemented ICT as a promoter of School Readiness (SR) in preschoolers from an economically disadvantaged area. It intends to: a) Document the effectiveness of the practice in terms of concrete and measurable SR outcomes; b) Characterize the possible drivers and barriers of implementing such practice in preschool, gathering the perceptions of children and their parents.

The intervention took place in a public preschool in Lisbon surroundings, during 4 months (16 sessions of 60 minutes each). The final sample includes 22 preschoolers and 12 parents.

The mixed methods research design included scales, systematic observation and interviews with both children and parents.

Main results emphasize: the improvement of SR in children, with statistically significant results between pre and post intervention assessment; the perception of a high educational value attributed to the intervention by both children and parents; and the beliefs of parents about ICT, mainly grounded on risks, emerging from their notion of being less empowered than their children in using it. These results also highlight the discussion on how to empower parents with lower educational levels to raise children in a highly digital world.

Keywords: Children; Parents; ICT; Media; School Readiness.

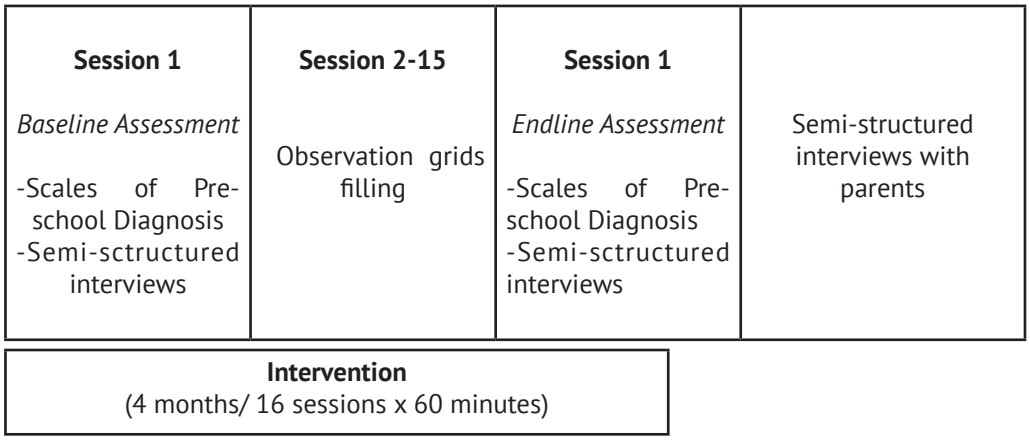
Introduction

School Readiness (SR) is a broad and complex concept with a considerable number of different definitions and discussions around the conditions for its promotion (Britto, 2012, p. 4). Although there are several specific aspects in each definition, there is almost consensual that SR represents a composite of the readiness of an individual child and that of the environment into which she/he enters when starting school (Blair & Raver, 2015; Kagan & Neuman, 1997). Moreover, SR is understood as a multidimensional and complex concept (Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Hughes, White, Foley, & Devine, 2018; Majzub & Rashid, 2012), where three different dimensions must work in tandem, namely: (1) children's readiness for school, focusing on learning and development; (2) schools' readiness for children, focusing on the school environment and practices that support the transition into primary school, and (3) families' and communities' readiness for school, focusing on parents and caregivers attitudes towards this transition (Britto, 2012, p. 7).

The present study aims to explore the results of an educational practice that implemented ICT as a promoter of SR in preschoolers from an economically disadvantaged area. It intends to: a) Document the effectiveness of the practice in terms of concrete and measurable SR outcomes; b) Characterize the possible drivers and barriers of implementing such practice in preschool, gathering the perceptions of children and their parents.

Research Design

To operationalize the above defined research aims, a multi-method research design was adopted, allowing this research to better understand the phenomena, while operating at different levels of the educational ecosystem (Elliott, 2007; Tobin & Ritchie, 2012; Vittadini, Carlo, Gilje, Laursen; Murru, & Schrøder, 2014).
The mixed methods research design included: a) Baseline and endline assessment of preschoolers using Pré-Escolar - Scales of Preschool Diagnosis (Cruz, 1993) to evaluate SR, and semi-structured interviews, to gather data about their perceptions on ICT, media, SR and also on the project itself; b) Observation grids filled in each session, to systematize data about the most frequent expressed behaviors, perceptions and difficulties of children; c) Semi-structured interviews to parents, after the end of the intervention, about their main beliefs on the role of media and ICT in their children's lives, perceived risks and opportunities, and about their experience in cooperating in the project's activities. All the phases of this research design are represented in Figure 1.



Scheme of the adopted Research Design

The Pré-Escolar - Scales of Preschool Diagnosis (Cruz, 1993) is a tool for the assessment of the basic components involved in the school learning process. Its main aim is to evaluate each children maturity to begin the formal schooling process, being developed to be used at the end of preschool. The application of the scale takes around 60 minutes. The scale subtests allow partial assessments in the following areas: verbal (with a maximum possible score of 16); quantitative concepts (with a maximum possible score of 14); auditory memory (with a maximum possible score of 7); shape constancy (with a maximum possible score of 12); space positioning (with a maximum possible score of 14); spatial orientation (with a maximum possible score of 16); visuomotor coordination (with a maximum possible score of 12); and figure-ground discrimination (with a maximum possible score of 9).

The scale is adapted and validated to the Portuguese population, with a moderated internal consistency, with a Cronbach's alpha ranging between .32 e .95 (N = 758).

Intervention

The intervention was held during the 2016/2017 school year, in a pre-school in Lisbon surroundings. Weekly, the group of students was divided in two subgroups, of eleven students each, to attend to an atelier of school readiness promotion, during 60 minutes.

The intervention was based in the first dimension of SR, as defined by Britto (2012, p.7) as the children's readiness for school, focusing on children's learning and development factors. The main intervention axis were defined considering the three domains that are framed in this dimension of SR, namely: learned behaviors; attitudes and emotional competence, and developmental maturation (Britto, 2012, p. 10).

As described by Macdonald and McCartan (2014), there are several main areas that have been adopted as focus in interventions aiming to promote SR. In this study, the main emphasized areas are: social and emotional development; approaches to learning; and cognition and general knowledge.

The main tools or materials used in this intervention were ICT/media based, as well as the projects developed by children. Videogames were an important tool to stimulate cognition. Small animations were mainly used to stimulate emotional development. Project-based learning (PBL) was used to promote the approaches to learning area, including small searches on the web and content production, using tools, such as Microsoft PowerPoint or Microsoft Paint. The promotion of social development was aimed by working in groups in each project, as well as by presenting the works to the rest of the group. It is relevant to highlight that these skills are not independent or mutually exclusive. Therefore, regardless of this detailed aimed, the areas of competence were promoted in an interconnected manner.

The projects developed by children were simple and adapted to their development level. The main themes approached in the projects were related with future, professions and life projects. Another relevant aspect of the intervention is that each task developed by children was accompanied by a critical analysis and/or reflection activity, based on the idea that the processes in which children make meanings and construct their own understanding of their world is often more important than the final outcome (Tay-Lim, 2011).

Sample

In this study, a convenience sampling procedure was adopted. A sample of 22 children from a preschool class were included. This preschool was part of a public school in Lisbon surroundings classified by the Ministry of Education as an educational area of priority in terms of intervention and characterized by households: with low socio-economic status; employment precariousness, or outright unemployment; food shortages; fragile health and hygiene conditions; problems of social exclusion; and a high rate of ethnic diversity. Considering the school's pedagogical project, the main problems are lack of interest and discipline, weak engagement in the learning process, low attendance and frequent failures in each grade. The final sample was composed by 22 preschoolers, aged between 5 and 6 years old (M = 5,50; SD = 0,51), seven females and 15 males. Afterwards, the parents or educators of each child were contacted by the school director, in order to be interviewed at the end of the intervention. The final sample of parents was composed by 12 parents (mothers, father and one aunt) aged between 20 and 39 (M = 25,33; SD = 4,84), nine females and three males. The parents have between 0 and 12 completed years of schooling, with an average of five completed years.

Data Analysis

The gathered data was analyzed in two distinct manners. Data from Pré-Escolar - Scales of Preschool Diagnosis (Cruz, 1993) were analyzed first considering the guidelines manual of this measure, considering the defined dimensions, and after using IBM SPPS, version 20. Results from each dimension don't follow the normality criteria, hence results between baseline and endline were analysed using Wilcoxon signed ranks test.
Data from the semi-structured interviews to children in baseline and endline and the semi-structured interviews to parents were analysed using a content analysis procedure, with a specifically developed coding system, and the NVIVO software, version 11.

Results

The results from Pré-Escolar - Scales of Preschool Diagnosis (Cruz, 1993) show the existence of statistically significant differences, between baseline and endline assessment scores, for all the dimensions of the scale, as shown in Table 1. These results include the existence of a statistically significant difference between the total score of the scale (p = .000), between pre intervention assessment (M = 59,36; SD = 20,29) and post intervention assessment (M = 63,73; SD = 19,258).

Table 1.
Results from baseline and endline assessment (N = 22)

	Baseline		Baseline		*p*
	M	SD	M	SD	
Verbal	10,59	3,64	10,86	3,56	0.34
Quantitative concepts	8,45	3,59	8,77	3,39	.008
Auditory Memory	3,32	2,23	3,64	2,08	.008
Shape Constancy	7,55	2,90	7,95	2,71	.011
Space Positioning	8,36	4,11	9,18	3,97	.000
Spatial Orientation	9,73	4,72	10,54	4,55	.000
Visuomotor Coordination	6,55	3,34	7,50	3,14	.000
Figure-ground	4,82	2,68	5,27	2,622	.007
Scale Total	59,36	20,29	63,73	19,258	.000

When triangulating these data with the content analysis from the observation grids it is possible to highlight the decrease in the prevalence of behaviors coded as “difficulty in developing the task” or as “difficulties in language”, throughout the intervention. In session 2, for example, the most prevalent coding is “difficulties in language” (14% of all the coded observed behaviors) and in session 14 the most prevalent coding is “successful completion of the project” (21% of all the coded observed behaviors).
By analysing the engagement in the sessions, it is also possible to highlight the higher frequency of engagement behavioral expressions in tasks associated with media usage, like playing a game or watching an animation, than in tasks associated with media production, like creating a small Microsoft PowerPoint presentation. Nevertheless, the engagement seems to increase throughout the intervention too. For example, in session three the most prevalent coding is “lack of attention” (19% of all the coded observed behaviors), but in session 11 the most prevalent coding is “having fun” (23% of

all the coded observed behaviors), followed by "engaged in the task" (17% of all the coded observed behaviors).
Another result from the analysis of the observation grids is related with autonomy. While in sessions two, three and four the "autonomous performing of task" ranged between 4% and 7% of all the coded observed behaviors, in sessions 13, 14 and 15 the same coding ranged between 20% and 23%.
In the field of constraints for this ICT based intervention in preschools, it is important to highlight the prevalence of situations coded in the grids as: "constraints with computer's availability" (5% of all the coded material); "constraints with Wi-Fi network" (4%) or "constraints with room availability" (2%). The behavior of the participants was also a challenge and it influenced the following of each session's planned activities. Nevertheless, it was frequently used as a motto for the next session. For example, an anger issue in one of the sessions was used as an example in the next session's emotional development activity. The attendance to the sessions was also a challenge, with some participants missing more than two sessions.
The semi-structured interviews with children, included in the baseline assessment highlighted the beliefs of children about activities like media production, web searching, using computers, mainly considered as "too difficult" or "too difficult for children" (33% of all the coded answers). The endline semi-structured interviews emphasized the kid's assessment of their own experience in the sessions. When asked about their feelings on the intervention all the answers had a positive connotation. The most referred words are represented in Figure 2.

Figure 2. *Word cloud of beliefs about the intervention*

In both baseline and endline interviews, kids' beliefs about ICT and media were mainly associated with terms like "funny", "interesting" and "cool". Nevertheless, their possible pedagogical value was never referred autonomously, and these beliefs are mainly associated with "recreational" usages. When specifically asked about their perceived learning gains with the intervention, all the kids agreed that they have learned, with some interesting beliefs like "I learned more than in the normal days", referring to

the days were there are no intervention sessions.
The semi-structured interviews with parents also highlighted the perceived educational value attributed to the intervention. The main parents' beliefs about this are associated with the value of this intervention in engaging their children in school activities, more than the "traditional" approaches. A relevant example of this is from a parent who said, when asked about the intervention: "This can be an important chance for them to learn and have fun. She always sees school as boring and I'm worried she doesn't finish school. I don't want her to be a homeless, but to have a nice job". Thirty nine percent of the parents' beliefs about the intervention were coded as "greater engagement" or "funnier educational practices".
When asked about ICT and media in children's daily life, parents tended to emphasize the risks of their usage, such as dangerous content in the web (18% of all the coded material), addiction (15% of all the coded material), diminished social contact with peers and/or family (12% of all the coded material) or violence (6% of all the coded material). Aligned with these perspectives, 66% of the parents referred a very specific concern about their lack of skills or knowledge to mediate the relationship of their children with technology, frequently referring that their children have a higher level of knowledge in this field than themselves.

Discussion

The present study aimed to explore the results of an educational practice that implemented ICT and media as promoters of School Readiness (SR) in preschoolers from an economically disadvantaged area. The obtained results highlight the effectiveness of this practice, with statistical significant differences between the assessment scores, pre and post intervention. This intervention can be considered even more effective and feasible, as these outcomes are aligning with observation data documenting children's engagement in the process and progressive autonomy in ICT/media related tasks. This frames these findings not only in terms of quantitative outcomes, but also in terms of a comprehensive and progressive learning process.
The main drivers to the implementation of this ICT based intervention to promote SR are related with the educational value attributed by parents and children to it, recognizing its role not only in the promotion of competences, but mainly in increasing the engagement in the formal schooling process. Children perceived this intervention as funny, associating it with happiness, learning and friendship, highlighting the relevance of playfulness and collaborative work in ICT/media based interventions.
The main documented barriers result from children's and parent's attitudes and beliefs, as well as from the school environment variables. Dealing with ICT and mainly with content production is perceived by

children as too difficult. Moreover, constraints associated with computers, wi-fi network or space availability in schools can strongly condition the implementation of a technological educational approach in the preschool. Parents' beliefs about the relationship between children and technology are mainly associated with risks and danger. These beliefs are also framed in the perceived lack of competence of parents to mediate their kids' usage of technology, frequently associated with the idea that their children are more capable in this type of usage than themselves. This result highlights the relevance of evaluating the environment when studying the implementation of a pedagogical approach to promote SR. When framing this aspect with the third dimension of SR, as conceptualized by Britto (2012, p. 7), it is possible to say that even if this is an effective practice in terms of specific learning outcomes, its broader implementation would require the involvement of parents and their empowerment in this field.

Future studies must involve parents and families, as well as teachers and other stakeholders of the educational process, not only informing them, but also to train them in these issues. Moreover, similar studies including experimental research designs and larger samples could be important to legitimate the SR improvements as a result of ICT/media based interventions, and not as results of other factors, like childhood natural development processes, for example.

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ENGAGEMENT WITH DIGITAL MEDIA IN HOME ENVIRONMENT AND SCHOOL READINESS IN CROATIAN PRESCHOOL CHILDREN

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Abstract

Our aim was to investigate the use of various digital media for different purposes in home environment and its relation to the level of school readiness, namely graphomotor skills, logical reasoning and letter knowledge in children aged 6 to 7. Children (N=92) were tested for graphomotor skills, logical reasoning and letter knowledge while their parents completed a questionnaire providing us with the data about their own and their children's access to digital media in home environment. Results show low but significant negative correlations between the time spent using a computer on weekends and the number of letters children can identify correctly, as well as between the time spent using a smartphone on weekends and children's graphomotor skills.

Key words: preschool age, digital media, school readiness, graphomotor skills, logical reasoning, letter knowledge.

Introduction

In today's world, young children are often described as digital natives (Prensky, 2001). They live in homes saturated with digital media (DM). Rideout (2017) states that when it comes to children younger than 8 in the United States, 98% of them live in a home with some type of mobile device (smartphones, tablet devices such as iPads, Androids, or similar products), compared to 75% in 2013, and 52% in 2011 (Rideout, 2011, 2013). In Croatia, research shows that 80% of children live in a household with five or more digital devices (Buljan Flander, 2017) and most preschoolers use DM to watch cartoons on TV or on a computer (Kotrla Topić & Perković Kovačević, 2015). While children start using these media devices at an increasingly younger age (Zaman & Mifsud, 2017), researchers are still debating on the extent to which such engagements can potentially be harmful (e.g. Vandewater et al., 2007) or beneficial (e.g. Burke & Marsh, 2013).

In this research, we are interested in the association between DM use in a home setting and school readiness in preschool children. School readiness is defined as the social, emotional and cognitive readiness of an individual child to start primary school education (Čudina-Obradović, 2008). It is often assessed by different tests that use nonverbal tasks and it is considered both a minimum requirement for a child to be able to react appropriately to school demands and a good predictor of later academic success and positive adjustment to school surrounding (Lemelin et al., 2007). In Croatia, all preschool children go through school readiness assessment prior to enrolling in elementary school, but there is a lack of research on the relation between school readiness and children's habits of increasingly frequent DM use.

In this research, we focus on the cognitive domain of school readiness evaluated through graphomotor skills, logical reasoning and letter knowledge. Graphomotor skills are fine motor skills that are required for writing and are a significant predictor of later intellectual abilities (Ambrosi-Randić & Glivarec, 2017) and school achievement (Hadžiselimović, Vukmirović, & Ambrosi-Randić 2009). Recent studies show that extensive use of touch screen tablets in preschool children might be disadvantageous for the fine motor development (Ling-Yi, Rong-Ju, & Yung-Jung, 2017). Logical reasoning has been linked to mathematical learning in 6-year-old children, even after controlling for general cognitive ability and working memory (Nunes et al., 2007). Li and Atkins (2004) found that children who had access to a computer at home achieved better results on the measure of cognitive development and school readiness, even after controlling for children's developmental stage and family socioeconomic status (Li & Atkins, 2004). Furthermore, in a recent review of studies on the impact of touch screen devices on

learning and development, Herodotou (2017) found that the majority of studies reported positive effects on mathematics, science and problem-solving, among other things. Finally, letter knowledge at preschool age is found to be a strong predictor of learning to read (Foulin, 2005). Previous research found a positive correlation between computer use at home and letter knowledge, even after controlling other cognitive and environmental factors that are known to predict letter knowledge (Castles et al., 2013).

As mentioned earlier, nowadays, children use a variety of DM in their homes, often simultaneously, so we believe that further research is needed to better understand the connection between media use and school readiness, particularly its cognitive domain which is often related to later academic achievement.

Our first aim is to describe the habits of Croatian preschool children and their parents when it comes to DM (tablets, smartphones, computers and TV) use at home.

Secondly, we investigate the relation between parental and children's use of DM.

Finally, we look at the relation between children's use of DM in a home environment and their level of school readiness, namely graphomotor skills, logical reasoning and letter knowledge.

Methods

This is a correlational study aimed at investigating the relation between children's use of DM (data reported by their parents) and their school readiness skills (data obtained through testing graphomotor skills, logical reasoning and letter knowledge).

Participants

The study included 92 participants, 39 girls and 53 boys, who came to elementary school for school readiness testing. The age span is from 6 to 7 years of age (M=6.3, SD=.374). Approximately one half of both mothers and fathers have high school education (47.8% and 46.5% respectively) with the other half reporting higher level of education. In almost two thirds of the families in the sample (59.8%), parents report good socio-economic status, and one third (35.8%) report having higher socio-economic status.

Procedures

The elementary school psychologist approached all the parents who brought their children for school readiness testing, asking them to participate in the research. One of the parents (either mother or father) filled out a questionnaire prepared for this study, providing us with data regarding their own and their child's use of DM, parental education and the family's socio-economic status. Children were tested in what was a standard testing procedure for all preschool children who were to start school in September that year. They completed the School readiness test with the school psychologist (Hadžiselimović, Vukmirović, & Ambrosi-Randić, 2008) and the speech pathologist administered the letter recognition test.

Measures

School readiness test
School readiness test is a group-administered test containing 40 tasks. It is constructed for children aged 6 to 7. The first 20 tasks form a measure of graphomotor skills, and the second 20 tasks form a measure of logical reasoning. The test has a fairly good prognostic validity of 0.70 for academic success and adjustment in the first grade of primary school (Hadžiselimović et al., 2008).

Letter recognition test
For the purpose of this study, we printed cards measuring 5x5 cm, with each card containing a different letter of Croatian alphabet, printed as block capitals. The letters were arranged in the alphabetical order and presented to the child one by one, starting with the first letter of the child's name. Total score on this test is the total number of correctly identified letters.

Parent Questionnaire
The questionnaire was devised for the purpose of this study. Parents reported how often their child watches television or uses a computer, tablet or smartphone on weekdays and over the weekend, using a scale with predefined ranges: 1 – less than an hour a day, 2 – from 1 to 3 hours, 3 – from 3 to 5 hours, 4 – more than 5 hours, or they could choose an answer saying their child has no access to such a device or is not allowed to use it. They also provided information regarding the purpose of children's use of digital devices and access to the Internet.
Furthermore, parents stated the average number of hours per workday and per the weekend that they themselves spend using a smartphone, laptop, desktop computer, tablet or television, regardless of the purpose of use.

Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) for Windows, version 21 (IBM Corp., 2012). When analyzing measures of children's use of DM, we used non-parametric statistical methods (Wilcoxon signed ranks test and Spearman rho correlation coefficients) because those measures had a distribution that differed from normal. Parental measures of DM use showed a normal distribution of results, so when analyzing those data, we used parametric statistical methods (t- test). All the tests were two-tailed and conducted at the 5% level of statistical significance.

Results

Use of digital media by children

When it comes to the time children spent using different digital devices, data were collected separately for working days and weekends. The results are presented in Figure 1.

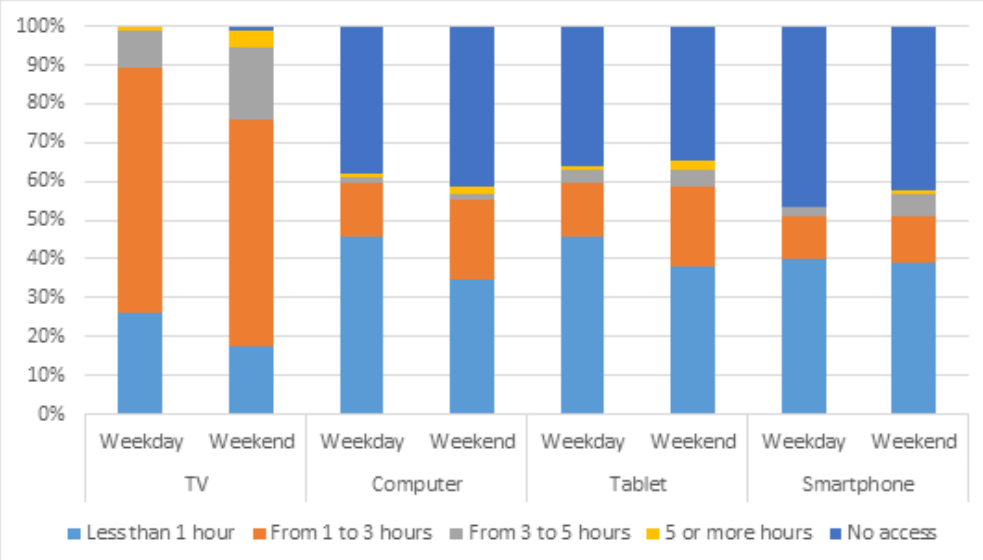

Figure 1. Percentage of children who have access to different DM for different time limit, during weekdays and weekend

Almost all the parents in the sample report that children spend at least some time during a working day watching television, with two thirds of children in the sample spending from 1 to 3 hours on this activity (63%), while 26.1% of children watch television less than an hour a day. There is also 10.1% of children who watch more than 3 hours of TV a day. During weekends, the time spent watching television significantly increases and although there are still two thirds of children in the sample who watch

TV from 1 to 3 hours, there are more children who watch it more than 3 hours a day (22.8%), and less those who spent under one hour in front of the TV (17.4%).

Around two thirds of children have access to a computer on weekdays and weekends, and they generally spend more time using it on weekends than on weekdays.

About one third of children in the sample does not have access to a tablet in their home. Those that do, spend more time using it during the weekend than during weekdays. Most children use it less than an hour a day (71.2% of those having access to it on weekdays and 58.3% of those having access to it during weekends), but for approximately 10% of them this time increases to 'between one and three hours a day' during weekends.

Smartphones are the devices which children have the least access to, compared to other devices (46.7% and 42.4% children do not have access to it during weekdays or during weekends, respectively). Among the children who do have access to smartphones, there is again an increase in the amount of time smartphones are used on weekends compared to weekdays.

Finally, we calculated an aggregate measure of children's total use of different media devices, separately for weekdays and the weekend. We then compared those results using Wilcoxon signed ranks test, which showed that during the weekend, children use DM significantly more than during weekdays (Mweekdays=5.62, Mweekends=6.37, Wilcoxon S-R test=-2.214, p=0.027).

We also wanted to know more about the purposes of children's DM use. Parents report that more than two thirds of children in the sample (72.8%) have Internet access at home. Those children most often access the Internet using tablets (64.2%), but they also use laptops, smartphones or desktop computers (46.3%, 44.8% and 41.8% respectively).

When accessing the Internet, half of the children do it mostly with parental help and supervision (51.5%), 37.9% access it sometimes supervised and sometimes unsupervised, while 10.6% of them access the Internet mostly unsupervised.

When online, most children watch cartoons (74.6%) and play games (70.1%). About half of the children use the Internet to go on YouTube (58.2%) or for studying (46.3%), and only a quarter of them use it to communicate (14.9%) or find information using search engines, e.g. Google (19.4%).

Parents' use of digital media

When adding the time spent on each DM device during weekdays or the weekend, parents spend significantly more time using different DM devices during the working week than on weekends (Mweekdays=6.7, Mweekends=5,06, t=4.729, df=89, p=0.000).
Correlation between the parents' and children's measures of DM use during weekdays and during weekends show that children whose parents spend more time using digital devices during the weekend spend more time using such devices both on weekdays and on weekends (Table 1).

Table 1.
Spearman rho correlations between amount of time children and parents spend using DM on weekdays and weekends.

	1	2	3
1 Children – weekdays	-		
2 Children – weekend	.768**	-	
3 Parents – weekdays	.283	.182	-
4 Parents – weekends	.503**	.379**	.600**

** p<0.01, *p<0.05

Relations between children's use of DM and school readiness measures

Descriptive data for the letter recognition test, graphomotor skills and logical reasoning are presented in Table 2.

Table 2.
Descriptive statistics data for the school readiness measures

	N	Min	Max	M	SD
Letter recognition	84	1	30	22.67	7.771
Graphomotor skills	92	.50	28.35	18.05	6.809
Logical reasoning	92	6	20	13.78	3.217

In Table 3, we see that there is a significant moderately negative correlation between the time children spend using a computer during weekends and the number of correctly identified letters. This means that children who spend more time on the computer during the weekend identified less letters from the alphabet. There is also a moderate but significant negative correlation between the time children spend using smartphones during the weekend and their graphomotor skills, showing that children who use smartphones for a longer time during weekends have poorer graphomotor skills.

Table 3.
Spearman rho correlations between the time children spend using DM on weekdays and weekends and correctly identified letters, graphomotor skills and logical reasoning

	2	3	4	5	6	7	8	9	10	11
1 TV weekday	.274*	.106	.064	.602**	.317*	-.081	.045	-.11	.048	-.056
2 Computer weekday	-	.067	-.203	.126	.584**	.163	.056	-.188	-.176	-.018
3 Tablet weekday		-	.423P	.127	-.099	.727**	.249	.19	.187	-.158
4 Smartphone weekday			-	-.034	-.116	.103	.735**	-.051	-.146	-.155
5 TV weekend				-	.402**	.25	.131	-.048	-.007	-.04
6 Computer weekend					-	.225	.217	-.286*	-.265	.001
7 Tablet weekend						-	.447**	.153	-.01	-.179
8 Smartphone weekend							-	-.118	-.311*	-.098
9 Letter recognition								-	.400**	.355**
10 Graphomotor skills									-	.377**
11 Logical Reasoning										-

** p<0.01, *p<0.05

Discussion

The study aimed to investigate the habits of DM use among Croatian preschool children, and to achieve better understanding of how such use is related to their school readiness. Our focus was on preschool children because they are less represented in the research literature, and because compared to older children, they spend quite a lot of time at home and with their parents (Plowman, 2015).

Our results show that television is still the primary form of screen exposure. This is in accordance with previous research conducted for children in this age range in various European countries (Ofcom, 2017; Genc, 2014), as well as in Croatia (Kotrla Topić & Perković Kovačević, 2017). Two thirds of our participants watch from 1 to 3 hours of television a day during weekdays and a little more during weekends, which is very similar to data from other countries (Kozuchova & Baskova, 2013; Genc, 2014). However, while Kozuchova & Baskova (2013) found that increased number of hours spent watching TV decreased school performance in older children, we found no significant correlations between watching television and school readiness variables in preschool children.

Furthermore, our results show that two thirds of children in the sample have access to a computer at home, which is not surprising since most parents indicated they had a fairly good living standard. Other media devices are less represented, with the smallest number of children having access to smartphones. Children use DM significantly more during weekends compared to weekdays, as previous studies also show (Genc, 2014).

As for the Internet use, two thirds of children have access to the Internet at home. They mostly go online with at least occasional parental help and supervision, with only 10% of them using the Internet mostly unsupervised. Vittrup et al. (2014) emphasize that parental help and surveillance in media use is important because at this age, children are still unable to critically evaluate complex uses and meanings of different media. Activities children most often engage in while online are watching cartoons and playing games. Similar findings come from previous studies (Livingstone & Bober, 2005).

We found a moderately negative relation between computer use during weekends and the number of correctly identified letters. Although determining the exact nature of such a relation is beyond the scope of this study, we might hypothesize that children who use computers more during weekends spend less time engaged in other activities with their parents, which might include activities that promote literacy skills, including letter recognition. Previous research found positive correlations between computer use and letter recognition, but for children younger than in the present study (Castles et al., 2013), as well as positive correlations between computer access at home and math and reading scores, but

for school aged children (Attwell & Battle, 1999). Also, it might be that children of different age use media devices in a different manner and for different purposes, which might contribute to their emerging literacy skills, but it can also be that their interactions with DM have different effects considering the stages in their cognitive development. There is also a moderately negative correlation between smartphone use during weekends and graphomotor skills. This finding is important, since those skills are required for writing. Previous experimental research on touch screen use found that extensive use of touch screen tablets in preschool children might be disadvantageous for the fine motor development (Ling-Yi, et al., 2017).

Our results also show that children whose parents spend more time using DM during weekends spend more time using such media both on weekdays and on weekends. This is no surprise, since previous research shows that parents' habits in this domain are strongly related to their children's use of media devices (Nikken & Schols, 2015). This result is interesting however, since we previously reported that parents spend more time using DM during weekdays than on weekends. A possible explanation is that during weekdays, they use such devices for work as well as pleasure and during weekends, there is a greater chance their use is related to pleasure activities, and it might be that such use reflects their perception of DM, specifically regarding their children's use of such media. Also, it can be that children use DM at the same time as their parents.

In conclusion, our research shows that some aspects of preschool children's use of DM might be negatively associated with their school readiness, namely letter recognition and graphomotor skills. Further research is needed to analyze the exact nature of these relations and the possible effect of DM use on school readiness.

Limitations of the study

The main limitation of the study is the sample which is not representative in terms of level of parental education and socio-economic status. Another limitation is that the data on children's and parents' use of DM come not from observations, but from parental estimates, and previous research points to the lack of parental awareness of their children's media usage (Rideout et al., 2003). Finally, the study did not look into the specifics of use in terms of content for each DM device, which might be of importance in the interpretation of results. For future research we would also recommend considering parental attitudes towards different types of children's media use.

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YOUTUBE & YOUNG CHILDREN: RESEARCH, CONCERNS AND NEW DIRECTIONS

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Abstract

Since the first episode of Sesame Street was aired in the 1960s, video watching has become a daily activity for most young children. Gradually, advances in technology transformed children's video watching practices as well as the preferred video watching devices or platforms (such as educational television, baby DVDs, and computer technologies). As a result, children's video watching has shifted from educational televisions to mobile devices (e.g., tablet and smartphone), streaming media, and online platforms. According to recent research findings, YouTube and YouTube Kids are popular platforms used by children to access a variety of videos for education or entertainment purposes.

In contrast to the decades of research concerning educational television, studies of YouTube and similar platforms are still in their infancy. Our understanding of the nature and extent of children's engagement with this platform and its potential benefits and risks for children's learning and development is limited. Young children (age 8 or younger), as well as older children and teenagers, frequently watch videos on YouTube. In this chapter we review the limited recent research examining young children's use of YouTube and YouTube Kids. Also parental and expert concerns, children's digital safety, the commodification of childhood, and new directions are addressed for future studies.
Keywords: YouTube, children, video, digital safety, parents.

Introduction

The early childhood years are a crucial period for young children's development and foundational skills (National Research Council and Institute of Medicine, 2000). Today's young children are growing up in technology-rich environments (AAP Council on Communications and Media, 2016). For example, it was reported in 2017 that children younger than 8 years spend an average of 2 hours and 19 minutes a day with both traditional (TV, computer) and emerging digital media (tablets, smartphones, e-readers). Even though television viewing continues to dominate children's daily media use, their digital media use has increased dramatically in the last few years (Rideout, 2017), and further research is needed to understand how various digital technologies play a role in children's development and learning (AAP Council on Communications and Media, 2016).

In recent years, YouTube and YouTube Kids have become increasingly popular platforms that young children use to watch videos (Marsh et al., 2015; Ofcom, 2017; Rideout, 2017). In this chapter, we consider young children's use of YouTube and YouTube Kids, and review the relevant literature published during the past decade. In reviewing young children's digital media use, we consider research that had been conducted with children from birth to 8 years (Rideout, 2013, 2017). The review of research articles, media reports and online posts was narrowed down by using key terms such as "YouTube and children", "YouTube Kids", "YouTube and young children", "YouTube and families", "YouTube and early childhood", and "online viewing". We summarized the recent literature by providing an overview of research findings from studies of YouTube and YouTube Kids as well expert and parental concerns about children's digital media use, and addressed gaps in the literature by suggesting possible directions for future research.

Youtube & Youtube Kids

YouTube is a video-sharing platform, which has received worldwide attention since it was created in 2005 (Wikipedia, 2018). YouTube provides users opportunities to upload and view videos, rate, share, report or comment on videos, and subscribe to other users' channels (Wikipedia, 2018). As of July 2018, it was listed as the second most popular site in the world (Alexa, 2018). YouTube has been described as "the king of video" wherein children watch a variety of content for helping with school or homework, or for fun and entertainment purposes (Smarty Pants, 2017). The YouTube platform includes numerous channels, which share educational videos as well as unboxing, challenge or game videos created for children (Knorr, 2016). Of such videos, cartoons, animations, funny videos, music videos, game tutorials and "how to" videos have been identified as the most popular videos preferred by 3- 7 year old children (Ofcom, 2017).

A recent marketing research study reported that YouTube is the most well-known brand in children's lives in the United States. A majority of children (96%) between 6-12 years of age reported that they were aware of YouTube, and more than 80% of those children used YouTube on a daily basis. Out of those participants, 65% of the children used YouTube several times a day (Smarty Pants, 2017). YouTube's popularity by children seems to be universal. For example, Marsh and her colleagues (2015) and the Ofcom (2017) reported similar results for children in the United Kingdom. The YouTube application (app) was one of the most popular applications preferred by preschool aged children (age 5 or younger) and their families (Marsh et al., 2015). Ofcom (2017) also reported that since 2016, the use of YouTube by 3-4 and 5-7 year-old children has increased significantly. Researchers report similar findings concerning this platform's popularity among young children and their families in various other countries such as Turkey (Izci, Jones, Yalcin & Bahcekapili, in preparation), India (Yadav, Chakraborty, Mittal, & Arora, 2018), and Israel (Elias, & Sulkin, 2017).

YouTube Kids is an application (app) designed specifically for young children age 5 or younger. It has been promoted as "a world of learning and fun, made just for kids" (YouTube Kids, 2018). YouTube Kids is available on Google Play and App Store for its users. As of July 21, 2018, it has received 4.7/5 stars on Apple Store, as well as 4.5/5 stars on Google Play (Apple Store, 2018; Google Play, 2018). In addition, it has been made available in 37 countries and has had more than 70 billion views and more than 11 million weekly active viewers as of November 2017 (YouTube Kids, 2017). Young children and their families seem to prefer the YouTube Kids platform, an application that is similar to YouTube but aimed at young

children (Ofcom, 2017).

According to its developers, YouTube Kids was created "to make it safer and simpler for kids to explore the world through online video", and as such it includes "a whole suite of parental controls, so you can tailor the experience to your family's needs," (YouTube Kids, 2018). The videos on YouTube Kids are filtered by the target audience's age. Its algorithm shows videos on the surface of the app based on a user search and viewing history, as well as other data (Lafrance, 2017; Wamsley, 2017). There is, however, considerable variation in the quality of the videos on the platform based, in part depending on the entity (e.g., individual user or commercial) that was responsible for uploading the content. This is possibly why the YouTube Kids algorithm has been frequently criticized by (Lafrance, 2017; Maheshwari, 2017; Wamsley, 2017). In order to address those criticisms, the following information has recently included on the YouTube Kids website: "We use a mix of filters, user feedback and human reviewers to keep the videos in YouTube Kids family friendly. But no system is perfect and inappropriate videos can slip through, so we're constantly working to improve our safeguards and offer more features to help parents create the right experience for their families" (YouTube Kids, 2018).

YouTube and YouTube Kids are popular, but relatively new media platforms that young children and their families use to watch online videos. It is believed that when used intentionally and appropriately, technology and digital media (such as YouTube), can contribute to young children's learning (NAEYC & Fred Rogers Center, 2012). On the other hand, without parental monitoring, young children using the YouTube and YouTube Kids platforms could be placed at risk of being exposed to inappropriate content or language, violence or videos with limited or no educational value. To our knowledge the research designed to understand possible positive or negative effects of these platforms on children's development and learning is limited. In the following section, we review relevant research findings published during the past decade.

Prior Research

During the past few years, the popularity of YouTube and YouTube Kids has captured the attention of researchers from a variety of academic disciplines. In this section, we review a limited number of research studies conducted with young children and their families in an effort to understand children's media use (including YouTube), as well as the ways in which media platforms, such as YouTube, influence children's lives. Preliminary research suggested that YouTube is a universally well-known platform used by children and families for a variety of reasons including educating children, keeping them busy, or for their entertainment (e.g.,

Elias & Sulkin, 2017; Ofcom, 2017; Marsh et al., 2015; Yadav, Chakraborty, Yadav et al 2018).

While it is well established that children of all ages use YouTube, one of the preliminary studies reported that children as young as 2-3 years old are able to use YouTube (Buzzi, 2012). Not only were these young children able to play the videos, but they were also adept at moving from one video to another on the playlist. Then, more recently, researchers found that children as young as 6 months are exposed to videos on the YouTube platform. Before reaching the milestone of their first birthday, children seem to be attracted to music videos (Yadav et al., 2018). Then, by the time they are 12 months old children have an interest in watching other types of videos with different content (Yadav et al., 2018). For example, according to the same study, young children enjoyed watching dance videos, advertisements, as well as videos that portrayed toys and balloons. It has also been claimed that although YouTube videos do not entertain young children and keep them busy, it seems that children between 6-24 months are not able to learn anything from those videos (Yadav et al., 2018). Then, an Israeli study examined the online video watching of children aged 18-36 months. The researchers found that parents used online video platforms (such as YouTube) for several purposes including calming children, entertaining or educating their children, and as something to watch during meal times (Elias & Sulkin, 2017). Such activities seem consistent with researchers' assertion that parents use YouTube and other platforms as a form of "digital babysitter" (Elias & Sulkin, 2017). Similar findings have been reported in studies conducted in the United States (Rideout, 2017). It seems that the majority of children under 8 years of age use tablets and similar devices to regularly watch videos online (Rideout, 2017). In the study, Rideout (2017) reported that children use various online platforms (such as YouTube and Netflix) and spend an average of 17 minutes a day watching videos. Using these online platforms children can select from wide range of different types of videos. Educational videos were watched most often (64%), followed by animal videos (46%), how to do it videos (38%) and unboxing videos (34%). It seems, however, that children are also interested in other types of video content. In a case study, Marsh (2015) found that young children also enjoy watching other children's YouTube channels that were related to their interest areas.

The consideration of young children's access to YouTube and YouTube Kids is not valid unless we also include their parents. It is well established that parents' attitudes (being scaffolder or gatekeeper) play an important and significant role in the extent to which their children have access to digital media (Dias et al., 2016). According to a marketing research (2017), parents, as well as children, believe that YouTube is a popular brand in their lives. A majority of parents (94%) reported that they either loved or liked YouTube, and almost 70% reported that they used YouTube on a daily basis. In addition, in a recent study, 74% of children reported that their parents allowed them to watch

YouTube, and 43% of children between ages 6-12 often watched YouTube with their parents or with their whole family (Smarty Pants, 2017).
Since YouTube and YouTube Kids platforms are relatively recent topics of study, few studies have been conducted with young children and their parents. In the following section, we discuss parental and experts' concerns regarding YouTube and YouTube Kids as reported in the literature.

Concerns

Advances in technology and the affordability of tablets and similar devices have made video watching particularly easy and convenient for young children. Livingstone and colleagues (2011) believe that children's total media exposure increased as a result of the ease with which online content can be accessed. Relatedly, Rideout (2017) reported that video viewing is an activity takes up approximately three-quarters of young children's total screen time. For example, children aged 8 or younger watch TV/videos for an average of 1 hour and 40 minutes per day. During that time, they spend 21 minutes with tablets or other mobile devices (including 17 minutes a day watching videos on YouTube, Netflix and other platforms).
When young children's use of YouTube and YouTube Kids use are considered, parents and researchers seem to have several concerns regarding the platform's algorithm, finding high quality content, as well as online advertising, commodification of childhood, and protecting their children's rights. One concern is that young children like to watch the same videos over and over again, and the algorithm of YouTube recommends children videos that are similar to the ones they have previously watched (Lafrance, 2017). Burroughs (2017) claims that YouTube and YouTube Kids' algorithms consider infants as consumers, and as such they are labeled as "algorithmic infants." For example, if they like watching toy car videos, similar videos including toy cars appear on their screen as a result of the algorithm. Relatedly, video makers continue to make those videos, and children continue to "click" on those videos (Lafrance, 2017) which often includes commercial products with limited or no educational content.
One popular category of videos frequently watched by young children are toy-unboxing videos. Unboxing videos include other children's or adults' reviews of a set of objects inside a box (Craig, & Cunningham, 2017). Since young children seem to like a mystery or surprise, unboxing videos capture young children's attention (Marsh, 2015). The popularity of unboxing videos, however, is somewhat concerning because young children are seen as producers and consumers of digital content; that is a concern that it contributes to the commodification of childhood. For example, Dredge (2016) addressed increasing numbers of toy unboxing channels on YouTube and shared an example of one famous child YouTuber and his channel. Ryan ToysReview channel had 2.5 million

subscribers with 4 billion views at that time. Two years later, in July 2018, the same channel has almost 15 million subscribers and 23 billion views (Ryan Toys Review, 2018). Similar channels, which are either owned by individuals or companies, have millions of viewers per day. YouTube channels with unboxing videos or product reviews might provide free entertainment for young children and their families, but the quality or educational content of those videos is somewhat questionable. For some cases, it may be even similar to toy advertisements on TV channels, and may encourage young children and their families to buy the video's promoted toys and products. Relatedly, several researchers conducted studies to identify advertising in children's videos on YouTube. For example, Jorda (2016) reported that 37.5 percent of the advertisements in children's videos were unsuitable for children because they included physical danger or a moral hazard. In another study, Tan and colleagues (2018) indicated that food and beverage adverts (more than half of them were about unhealthy foods) targeted children.

Another important point is that the transition from television watching to using touch screen devices make it difficult for parents to monitor their children because of the smaller screen size, portability, and internet connections provided through the devices that children use (Uhls & Robb, 2017). In considering this aspect, Tan and colleagues (2018) claimed that children can access YouTube videos any time they want to through various digital devices, as opposed to broadcast television where children's programs are presented according to a specific schedule. In addition, children can choose from a variety of videos that are available on YouTube and repeatedly watch those same videos. A recent study (2017) conducted in the United Kingdom found that parents were more concerned about children's access to online content than about television or gaming content (Ofcom, 2017). Furthermore, they had some possible strategies to prevent children from accessing inappropriate content. It has been reported that half of parents of 3-4 and 5-7 years old children were aware of YouTube's restricted mode to filter inappropriate content (Ofcom, 2017).

Given parental and experts' concerns, further action should to be taken to protect young children from possible risks of being exposed to inappropriate content and advertisement on YouTube and YouTube Kids. In addition, further research should be conducted with young children and their families to further our knowledge of children's online viewing practices as well as the importance of providing age-appropriate, high quality, digital content for children on YouTube and similar platforms. The following section presents our perspectives concerning new directions for future studies.

New Directions

As a result of the availability and affordability of touch screen devices and young children's increasing use of media, the American Academy of Pediatrics (AAP) revised guidelines for children's media use. According to the revised guidelines, digital media use, excluding video chatting, should be avoided for children younger than 18 months. Children between 18 and 24 months can use digital media, but they should do so with a parent, and they should only use high-quality programs. Furthermore, their use of digital media should be restricted to 1 hour per day of high-quality programs. Then, it is recommended that children ages 2 to 5 years co-view with their parents (AAP Council on Communications and Media, 2016). Another recommendation is that parents use digital media wisely as opposed preventing their children from using it. Moreover, parents are encouraged to jointly engage in digital media activities with their children by introducing them to high-quality content that is educational and prosocial. It is considered the parents' role and responsibility to monitor media content to prevent children from distracting and violent content. Furthermore, keeping screen-free time for bedrooms, mealtimes, and parent-child play can contribute to better parent-child interactions as well as healthy eating and sleeping habits (AAP Council on Communications and Media, 2016).

Reports of children's media use, marketing research findings, and several studies recently published provide a glimpse of how YouTube and YouTube Kids play an important role in children and families daily lives. Yet, information concerning how these media platforms influence children's learning and development during the early childhood years is limited. Thus, there is a need for studies, either qualitative or quantitative, concerning children's increasing use of YouTube and YouTube Kids. Empirical studies examining young children's preferences and behaviors while watching YouTube videos, including observations in naturalistic contexts (e.g., home, school) could extend our knowledge of the possible benefits and risks of online videos for young children. For example, interviewing YouTuber children and their families would shed light on this topic and further our understanding of the extent to which children's lives are becoming commodified. Conducting research such as focus groups, interviews and survey research would also provide insights into the nature and extent of young children's YouTube use as well as their parents' perspectives. Research can also be conducted with parents and educators in order to understand their knowledge about finding high-quality or educational videos, children's digital safety and digital rights.

Conclusion

YouTube and YouTube Kids have received worldwide attention from young children and their families in recent years. Young children, as well as older children, enjoy watching videos on YouTube or YouTube Kids platforms. Even though available media research examined an average time spend by watching online videos (either YouTube or similar platforms), and type of the videos are viewed by young children, research studies identifying its potential benefits and risks for children's learning and development are still limited. In our chapter, we summarized the recent literature by providing an overview of research findings from studies of YouTube and YouTube Kids, expert and parental concerns about children's digital media and address gaps in the literature by suggesting possible directions for future research. We believe that further research should be conducted in a timely manner in order to expand our knowledge about potential benefits and risks of online videos as well as educating parents about the well-being of young children in this digital age.

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PARENTAL PERSPECTIVES OF CHILDREN'S USE OF INTERNET CONNECTED TOYS

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Abstract

Internet Connected Toys (IoToys) are becoming increasingly popular among very young children (birth to seven years) within families. Meanwhile, increasingly complex and multipurpose digital devices and IoToys require new attitudes, aptitudes and competences on the part of parents.
This qualitative study focused on examining how children interact with IoToys at home and in early childhood education. Data were collected using a multi-method approach over an eight-month period. We conducted interviews with parents and teachers, observed children and collected videos of children's use of IoToys to capture daily habits, experiences and attitudes in two contexts: home and education. Data were collected in four regions: England, Central Scotland, Northern Ireland and Greece. A synergy between social ecology and family systems theory theoretical approach was used.
This chapter reports data gathered within 11 home settings in England and adopts a parental perspective on the use of IoToys. Results indicate that parents feel digitally literate but have concerns about the use of IoToys at home. In particular with their ability to deal with uncontrollable pop-up advertisements and inappropriate pop-up images and, at an emotional level, their feelings about their own digital skills. The findings suggest that parents' view of IoToys pose opportunities and challenges for entertainment and learning, but they expressed the need for support to be able to choose safe and high-quality digital content for their children.

Key-words: Internet of Toys (IoToys), children 0-7, home, early childhood education.

Introduction

With digital households evident in developed countries, parenting has received increasing attention from researchers who seek to shed light and offer some guidance and advice on how to regulate or manage children's technological interactions (e.g. Livingstone, Blum-Ross, Pavlick, Ólafsson, 2018; Palaiologou, 2017; Sergi, Gatewood Jr., Elder, & Xu, 2017; Smahelova, Cermak, & Smahel, 2017; Wartella, Rideout, Laurricella, & Connell, 2013). Most of this research is focused on screen-based devices and examines how parents and children use technology at home, the quality and quantity of their screen time exposure and online risk factors. It concludes that parents have concerns with technology, especially online use, are confused with the advice they receive and lack the necessary support to address questions such as 'what technology is appropriate?', 'how long children should use technology?' and 'what the online threats are?'.

Some (i.e Livingstone et al. 2015) have tried to link technology use at home with parenting styles. Similarly, Wartella et al., (2013) when surveying parents on digital media use in households proposed three types of parenting: media-centric, media-moderate and media-light parents. They associated these styles of parenting with the variety of media "ecologies" that each household have and concluded that parental choices of the technology used can shape children's behaviours. However, they concluded that the technology used by children was not the main concern of parents, instead they were concerned with more traditional issues such as their children's health, education and wellbeing. Others link technology use to the family's income. Livingstone et al. (2018) examined parental perspectives on digital media, they surveyed parents in the UK with children aged from birth to 17 years old. They found that parents believe that activities that are digitally mediated and facilitated bring families together (i.e video calls, playing games together), but

noted that this more evident in high income families who tended to be more engaged in their children's digital activities.
Concerns are also highlighted in the literature about family dynamics in digitally mediated households. Livingstone et al. (2018), for example, suggested that digital activities can lead to conflict between children and parents on time spent on screen and with children's preferred online activities. They identified that:

"for digital and non-digital dilemmas online searches are the first port of call for parenting questions. But other sources of support in parents' lives – partners, friends and relatives, health professionals or a child's school – are seen as better resources for non-digital questions more than digital ones. Notably, few parents feel they can turn to their own parents for digital advice, suggesting a generation gap that leaves parents unsupported when it comes to these essential and sometimes divisive issues" (p. 1).

Similarly, Palaiologou, (2017), focusing on the perspective of parents with children under the age of five, raised concerns around harm, commercial exploitation, parental neglect (i.e offering children an iPhone, so they can get on with household chores), social medial exploitation and noted that parents' digital competencies might be less advanced than their child's ability level. It was concluded that parents are confused and lack clarity about the guidance available.
With the speed of technological advancement and since the introduction of internet-connected things and with internet connected toys (IoToys) entering households in developed countries, it is anticipated that parents will find themselves seeking advice and guidance on how to integrate novel devices. It is likely that as technology develops rapidly and enters households prior to evidence-based research, parents will experience what Stephen and Edwards (2018) call techno tales, which spread anxiety and moral panic. In this chapter, which forms part of a bigger project, the key aim is to identify parental perspectives on the use of IoToys.

Theoretical approach

In our work (Arnott, Palaiologou and Gray, 2019a and b), we were interested in examining how children use IoToys from a holistic perspective in all aspects of their lives (home and school, families and education, formal and informal contexts). The theoretical framework for the qualitative study upon which this chapter is based is social ecology. This relates closely with systems theory which argues that social phenomena cannot be examined in isolation from all its components. In our work we attempt to marry social ecology and systems theory as both focus on the holistic richness of phenomena in their own context and attempt synergy between the social and the human development (Bookcin, 1993, 1995a, b).

A key element in social ecology and systems theory is the study of phenomena as systems. Through these lenses a social phenomenon as an entity can be seen to have a number of interrelated and interactive factors. Thus proponents of social ecology and systems theory study the dynamic of what happens to an aspect of a system that impacts on another one and how this changes the equilibrium of the system (Bookcin 1995 a and b, Ackerman 1959, Jackson 1965). Systems theory has also been adopted in the field of psychology for the study of families (see Ackerman, 1959; Jackson, 1965; Bowen, 1978). Using this approach a family is viewed as an emotional unit which operates as part of a larger family system and social ecology. Each member of the family has a role to play and the emotions of one member of a family has an impact on the other members of the family. A family as an emotional unit functions

when there is an equilibrium of feelings among all its members. They also promote the idea that to understand and support children well, family systems are key components of this understanding.

There is now research emerging (i.e Bito et al., 2018; Huber et al., 2018), that examines the use of technology in families and concludes that technology is now part of a family's daily activities and is not seen as different or unusual. Based on systems theory and social ecology, we base our research on the family systems and its social ecology. Thus in line with contemporary research, we view IoToys within the repertoire of activities within the family system. Thus, in our project we collected data from observations of children when they interacted with IoToys at home and we developed a multi-method approach to collect family perspectives, reactions, emotions and experiences. In our work we were not

"concerned with the construction of models that can be applied in all contexts. Instead the focus is on entities and their complexities and supports the idea that systems are not fragmented (unlike models) and all interwoven factors that are involved [and] are interacting in a continual manner" (Palaiologou, and Male 2018, p. 76).

Consequently, in this chapter, our discussion is informed by the view that families and their social landscapes in the digital age are not two separate systems but interwoven with each family needing to be studied and understood as an entity to respect its identity, diversity, roles, hierarchies, rules, rituals, customs and cultures.

The study

This chapter is based on a larger multi-methods study: An Ecological Exploration of the Internet of Toys in Early Childhood Everyday Life. It was conducted in England, Scotland, Northern Ireland and Greece. The project reflects the social ecology and systems theory that a phenomenon cannot be studied from one angle but requires a multi-methods approach with our data collected from children, parents, early childhood educations practitioners and teachers at home and education. Findings from the project are reported in Arnott, Palaiologou and Gray 2019 a and b, Palaiologou, Arnott and Gray under review.

In this chapter we report data from one of our research questions: What are the parental perspectives of the use of IoToys? We present data from eleven interviews with families conducted in England.

The interviews were semi-structured, and lasted for approximately forty five minutes and when possible both parents were present. The interview questions were around what types of IoToys are using the family, how and when they are used and what the parents' views were about the use of IoToys at home. We were also interested in finding out what their views were about how IoToys were portrayed in the media and what their views are about the inclusion of IoToys in their daily life. All the interviews were digitally recorded with the permission of the parents. The overall data was approximately five hours of recordings. All the recordings were returned to the parents for their approval and once the parents confirmed that we could use them, each was analysed. As this project had a limited budget, interview recordings were not transcribed by professional transcribers, but were uploaded to NVivo and imported to the TranscribeMe where the recordings were automatically transcribed and downloaded into our NVivo project files. Once this process was completed the interviews were analysed thematically. Initially, as we were concerned viewing families as a system, individual codes emerging from the relevant literature were clustered together to become axial codes which gave us the themes presented in the following sections.

The families were selected purposively among all the other parents who participated in the study as they had included IoToys as part of their children's play portfolio. The families had children from birth up to 6 years and 10 months. All families can be classified as belonging to the middle-upper socioeconomic and educational backgrounds as illustrated in Table 1.

Table 1
Participants demographics

Gender (n=22)	Ages	Education	Employed	Not in employment*
11 mothers	25-46	Undergraduate degree (8) Post graduate degree (3)	8	3
11 fathers	29-48	Undergraduate degree (6) Postgraduate degree (5)	11	None

*Mothers' choice not to work thus not unemployed but choose not to be in employment

The interviews took place in the families houses with both parents present. The EECERA (2015) ethics code of practice was followed. Participation was on a voluntary basis with participants having access to the data at all times. All the participants gave permission for their interviews to be used for publishing purposes with their anonymity retained. As the sample reported here is small, the nationality of the participants is not reported as they might be identified due to the demographic information presented.

Results

The data from the interviews demonstrated:

1.There is a breadth of digital literacy and confidence amongst parents within families.

2.There is a variety and diversity among families in relation to their digital habits and particular with IoToys.

3.Parental concerns about IoToys were at Practical and Emotional levels.

Parental practices with IoToys varied among the families and parents did not seek on perspective guidance of IoToys but one that respect the social ecology of its family.

Digital Literacy of Parents:

All the families in the English cohort perceived themselves as being digitally literate. In the question 'to what extent they feel confident with the use of technology' all of them rated themselves competent users of technology. However, seven mothers and six fathers said that they felt they struggled to keep up with their children's rate of technological advancement.

In the questions as to whether they would characterise themselves as having high levels of digital literacy and being critical in terms of their ability to choose, they felt confident to use and support their children with IoToys play, with fifteen parents considering that they were able to fit fully this description. The rest felt that they were capable of handling IoToys and supporting their children, but considered their skills limited, with one father saying that he was self-taught with IoToys use:

"I can't hide behind my finger [...] I do not always understand the technology as well as my four year old son, I do not have the skills to keep up and I am trying, this is where I want help, not to tell me for how long [meaning screen time], how much, what to do, but to help me with understanding the technology, this is the only way to support my children."

And another mother said:

"As you can see I have an iPad, iPhone and work with a computer every day, but the technology is moving and moving. Last night [name of child age 4yrs and 6 months] he asked me to buy him an app for [name of IoToy] and I spent two hours reading reviews and checking with my husband whether it was for his age or not. Ok we can do this, but what about other parents? "

Our participants were purposefully chosen as we were interested in their views of IoToys use in households. However, in the questions about parental competencies, dispositions, attitudes and aptitudes towards IoToys use, evidence from the data showed that parents (responses among 11 mothers and 11 fathers) characterised themselves as:

1.Advanced (7 responses (R), meaning confident and able to follow all the technological developments without support

2.ompetent users (7 R), meaning that they can use technology, but they have to work on their skills with "new" types of technology and felt they do not use technology to its full potential, and in need for some support;

3.Accommodating (8 R), meaning that they willingly integrate technology in their households as they felt it was important for their children's entertainment, play and learning but they felt they lacked skills to understand what good quality digital context is.

Use of IoToys at home

Thematic analysis of the interviews with parents identified the following themes in relation on how IoToys are used in their households (Table 2).

Table 2
Parental perspective of how IoToys are used at households (no of responders=22)

Themes	**Sub Themes**
Roles	Parents can offer mediation with the IoToys
	Children offer mediation to parents
Boundaries	Parents choose what was suitable for children
	Parents allowed free time activities with no adult presence
	Parents were present when children playing with IoToys
Rules	Parents had rules of IoToys use
Mediation	Parental direct mediation
	Parental indirect mediation
	Negotiation between parents and children
	Parental disengagement
Play	Parents expressed that their children played with IoToys
	Parents choose and use IoToys as a play toy the main criterion
Learning	Development of dispositions and skills towards technology
	Academic learning
Educational use	Parents did not choose or use IoToys as the key criterion

The data showed varied practices among families with IoToys. Some families allowed children free access to IoToys at any time. The IoToys were in the same area as their other toys and children did not need permission to access or play with them. Some other families had rules in terms of the use of IoToys. For example, in one family the children had to ask permission to take the IoToys and play and in another one play time with IoToys was limited to weekends. When parents were asked how they decided their practices with the IoToys there were varied responses. Some of the families (4) view IoToys as forming another aspect of their children's toys:

"His [IoToy] is his pet, he can play any time he likes "(mother)
"Her [IoToy] lives in her bedroom and she says goodnight every night, actually when it arrived this Christmas it has replaced her teddy [laughter] thank God ! [original emphasis] for that as the teddy was filthy [laughter] "(mother)

Others (7) though, had a set of rules on the use of IoToys compared to the use of other toys. Asked why they set rules around IoToy use they responded that, they had concerns (3 families) about what the media say about the use of children and technology and did not want their children to be exposed to technology more than a certain number of hours per week. Four families said that they restrict the use of IoToys to certain times of the day or the week (for example weekends), in line with their family lifestyle. Overall, all of the families include IoToys in family life to suit their family rhythms and habits.

The data also revealed that families believe that IoToys are integrated into but do not consume family life. The majority of parents (19R) felt that there was equilibrium amongst their children's activities at home. They felt that the media exaggerate claims regarding average households where, it is claimed, "children are glued on the technology" (father). For example, one Mother rationalised her choice of balance in children's digital and non-digital lives:

"When they [children] come home, they can play with the IoToys on their own, then it is dinner as a family, and then we try to do something altogether, whether it is playing with IoToys or a walk or watching TV, but we do not see IoToys as anything different from their other toys" (mother).

Parental Concerns

Parental concerns predominantly related to the quality of children's experiences with IoToys (practical-Table 3) and how the family unit were viewed in society (emotional) rather than considering the devices as addictive; a typically portrayed concern around screen-based media. We found that parents' concerns were practical focusing on the characteristics and functions of IoToys (as in Table 3) and emotional in relation to their feelings towards IoToys.

Table 3
Practical concerns

Themes	**No of Responses (n=22, no of mothers=11 and no of fathers= 11)**
Free internet apps and their quality	20
Uncontrollable pop-up advertisements	20
Inappropriate context pop-up images	20
Internet safety and risks	18
Cost	17
Support on the skills required the digital users and digital volunteers expressed the need for support with their skills, so they can in turn support their children's play;	15
The ages that the IoToys are marketed are not responding to the ages the children use it	15
The accuracy of the description and characteristics of the IoToys on the selling websites	15
The accuracy of the ratings and the reviews on the selling websites	15

At an emotional level (parents' feelings towards IoToys), of concern was the belief that there is not much advice or guidance on IoToys. In addition, they felt the advice and guidance that did exist either was not applicable to their own family's digital habits (15 R) or did not help them to orient their digital practices to foster optimal use of IoToys (16 R).
Parents raised concerns about feelings of "guilt" or "shame" fuelled by a culture of blame about the use of technology:

"Sometimes when I picked them up from the nursery they give us this magazine about parenting or in the parents' evenings they tell us no technology during week and only certain hours in the weekend. I can see this when they played with the iPad but the IoToys are different [...] I do not tell that mine are playing all week with the IoToys as not sure if it is a good thing to say" (mother).

In the question as to 'what their views are about the discussion of children either being addicted to digital toys or moving away from physical and more traditional toys?' parents said that they do not see this as a risk factor and that it is down to parents to teacher their child resilience, as they do in all areas of life:

"There was a period that my three-year-old only wanted to eat fried food and nothing else, we did not worry that she was getting addicted. When we bought her first IoToy, this was the only toy she wanted. The same Christmas her grandmother visited us and brought her a tea set [toy replica] our daughter forgot the IoToys and here [pointing to the researcher the play area], all dolls in a raw and they drink tea [laughter]. Children will always play with what is new and then the balance comes" (father).

Some parents believe that their child's technological experiences exist alongside other typical family experiences. Perhaps this was because they do not see IoToys as screen time but as "*more advanced toys [similar for example to] when the walking and talking dolls first appeared in our lives"* (mother). Here we begin to see a recognition from parents in the ways in which IoToys are perceived, shifting the conceptualisation of technology in households away from screen-based abstract media, to child-centred artefacts.

Discussion

As this is a small sample of parents and from a middle-upper socioeconomic and educational background we cannot make strong general statements on parental perspectives regarding the use of IoToys. However, we conclude that as IoToys become increasingly ubiquitous and affordable (Chaurdon et al. 2017, Mascheroni and Holloway, 2017,) and, although we cannot predict how technology will be developed in the future, that IoToys will change the landscape of children's play with technology in the 21st century. Thus, we argue that advisory and regulatory bodies need to start including the use of IoToys in their guidance to accommodate the tactile nature of this type of technology.

From the evidence of our data that showed varied digital practices with IoToys among families, we propose that guidance on family digital practices, habits, rules and boundaries is required to support and empower parents to develop their own skills, dispositions and critical digital literacy. This involves establishing a balance between telling them what to do and supporting them in finding a balance that suits their own family digital rhythms. In this way, they will feel greater confidence in shaping their family's personal digital habits. We argue that there is a need to have an equilibrium between advising parents about what to do and in assisting them in developing digital habits oriented around their own family system.

In our research the digital users and the digital volunteers groups of parents raised concerns that they would have been "eager to feel more confident" (father), firstly, for themselves as they could have supported their children better rather than "doing catching up all the time" (mother) and secondly as they could develop various types of mediation when playing with IoToys.

We propose that at policy, research and advice level parenting in the digital age needs a safe place to discuss, share and talk about technology without being judged on individual family digital practices and habits.

Parents with high digital literacy (advanced) showed a more critical approach to the use of IoToys, spent more time playing with their children and in choosing active mediation over restrictive technical tasks; thus recognising the opportunities that IoToys offer their children's play. They were also more relaxed about integrating them into their child's play and more likely to allow them time to use online resources, than parents with lower technical skills (competent users and accommodators). However, parents who considered themselves as either digital users or accommodators had practical and emotional concerns that appeared to restrict them from taking full advantage of IoToys potentialities and the opportunities they offer to children's play; although they had integrated them in their households. Also, they felt they could not choose the "right or safe high quality" (father) digital content for their children.

Conclusions

From data with eleven families on the use of IoToys from a synergistic approach between social ecological lenses and family systems theory, our data showed that parents seek information about "what-is" rather "what is not" and seek advice and guidance "that engaged in a continual self-organised process" (Brookcin, 1993, p. 5)

Although attempts have been made to provide guidance and support to parents in the digital age, especially with online risks, we argue that it is equally important to understand the rituals, customs, habits, and rhythms of individual families. We propose that there is a necessity to co-construct and co-create the advice and guidance of technology usage and the digital context in households especially in light of the expansion of IoToys with parents as partners rather than just as information recipients. Families need to be understood for their wholeness, their experiences that shape and are shaped of expectations by experiences concerning "what is" so they can find their own digital habits in the social ecology that they and their children live in.

While advice and guidance in parenting for the digital age is trying to deal adequately with the challenges of this age, we argue that there is a need for a far reaching transformation of the guidance mentality from a talk down care approach, into one of complementarity, in which advice is supportive of parents and deeply appreciative of the richness of the wholeness of the family as a system. Rather than giving tokenistic advice, we propose that the role of advice and guidance is not to see technology use by families as unnatural activities but the creation of a continuing process of working with families for developing potentially rational behaviours by empowering families rather than treat them as passive recipients.

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ANTE LOS NUEVOS RETOS EDUCATIVOS: PROFESORADO DIGITALMENTE COMPETENTE

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Resumen

Vivir en una sociedad dominada por la información y la comunicación requiere docentes conscientes de que el alumnado no van a tener el mismo nivel de desarrollo emocional, las mismas habilidades sociales y valores que las generaciones anteriores, ya que están sometidos a una hiperestimulación sensorial (L´Ecuyer, 2016) y, al mismo tiempo, reciben información fragmentada. Esta información la describe Gerver (2010) como un mundo descentralizado y que cada vez será más despersonalizado. Además, advierte Pérez Gómez (2007), se ha producido una alteración radical en la forma de comunicación de las personas, las formas de actuar, de pensar y de expresarse. Nos encontramos, por tanto, viviendo en una cultura de virtualidad real (Castells, 2001). De aquí se deriva el contexto de actuación de la escuela, la cual debe contrarrestar dicha situación, aumentando en el alumnado sus competencias digitales y sociales, fomentando el sentido crítico, la capacidad de autonomía y emancipación respecto a la información y a los medios. Esto hace imprescindible la formación docente en la competencia digital (Krumsvik, 2014; Philip & García, 2013) para que éste pueda hacer frente a los nuevos retos educativos.

Palabras-clave: sociedad de la información y comunicación, competencia digital, formación docente, tecnologías del aprendizaje y conocimiento.

Introducción

La revolución tecnológica, de la segunda mitad del siglo XX, ha dado lugar a un tipo de sociedad denominada "de la información y conocimiento". El marco postmoderno está constituido principalmente por esta nueva sociedad, descrita por Gimeno (2010, p. 180) en estos términos: "lo que se denomina como sociedad del conocimiento es un estadio de las sociedades desarrolladas en las que la información y el conocimiento tienen una mayor relevancia y son más necesarios para su funcionamiento y mantenimiento". Este flujo de información y conocimiento, así como de cambios de valores, actitudes, estilos de vida y expectativas que condicionan nuestra sociedad postmoderna, transformando el proceso de socialización de las nuevas generaciones, que han modificado el papel de instituciones tradicionales como la familia y la escuela (Pérez Gómez, 2003). Se puede afirmar que estamos viviendo en un "entorno humano virtualizado" (Roblizo & Cózar, 2015, p.24).

En esta nueva sociedad se requiere un docente consciente de que su alumnado no va a tener el mismo nivel de desarrollo emocional, las mismas habilidades sociales y valores que las generaciones anteriores, ya que están sometidos a una hiperestimulación sensorial (L´Ecuyer, 2016) y, al mismo tiempo, reciben información fragmentada.

Estamos en un proceso de transición, que nos exige identificar las características de la sociedad actual. Las Tecnologías de la Información y Comunicación (TIC) y los medios digitales han cambiado profundamente la forma en que los humanos nos relacionamos tanto con la información y el conocimiento, como entre los propios individuos (Pérez Gómez, 2003). Estas modificaciones están transformando la sociedad en general, y el mundo educativo en particular, puesto que la evolución de las TIC ha evolucionado el estatuto, construcción, flujo y posibilidades de la información (Paredes, Guitert & Bartolomé, 2015). Por tanto, es fundamental formar ciudadanos capaces de desenvolverse en la actual era digital, así como desarrollar competencias básicas suficientes que les permitan la inclusión en esta sociedad de forma natural y equilibrada (Cabero & Guerra, 2011). En este sentido, se hace necesario generar contextos de aprendizaje más acordes a las demandas de los participantes de la sociedad digital (Paredes, Guitert & Rubia, 2015).

La información la reciben los individuos a través de los mass media, que se han convertido en importantes agentes de socialización. Actualmente, los niños/as están siendo moldeados por dichos medios, pues han convertido la publicidad en un modelo a imitar (Chacón & Morales, 2014; Granado, Machín, Ordóñez y Barcia, 1997; Lahire, 2007; Martínez, Frías & Solano, 2016). En este sentido "la Tv, los videojuegos y las redes se han constituido como el escenario cercano que rodea el desarrollo y crecimiento de los individuos y condiciona con fuerza y perseverancia la for-

mación de la opinión pública" (Pérez Gómez, 2003, p.4).

Esta exposición constante a la información produce desorientación en los niños y niñas que tienen acceso a la misma, debido a que es ilimitada la cantidad de datos, que, en ocasiones, producen informaciones fragmentarias que desbordan su capacidad de organización en esquemas comprensivos, dispersan su atención y saturan su memoria (Pérez Gómez, 2012). Nos encontramos con nuevas generaciones con una mayor competencia tecnológica (Marcelo, 2001), sin embargo, sólo los individuos que posean una formación adecuada, tendrán la capacidad de comprender, analizar de forma crítica la información, y construir un conocimiento útil y relevante. La era de la información y del conocimiento es una era de incertidumbre que requiere ciudadanos capaces de entender la complejidad de situaciones y el incremento exponencial de dicha información y conocimiento, así como la adaptación creativa a la velocidad del cambio y a la incertidumbre que le acompaña (Pérez Gómez, 2012).

En esta amalgama de cambios, la escuela también está sufrido importantes modificaciones.

Nuevas exigencias para la escuela

La escuela y el sistema educativo, en gran parte obsoletos, se muestran incapaces de afrontar satisfactoriamente los desafíos de las nuevas formas de vivir en las sociedades contemporáneas (Pérez Gómez, 2003).

Las instituciones educativas, lejos de competir en la era de las nuevas tecnologías con otros agentes de difusión y propagación de información mucho más potentes, han de caracterizarse fundamentalmente por ser agentes que ayuden a los educandos a dar sentido, interpretar, contextualizar y criticar dicha información más que ser transmisores de información. Las TIC deben servir de base para el surgimiento de un entorno nuevo y diferente, dentro del cual se deben implementar los procesos de enseñanza-aprendizaje (Brunner, 2003).

Por tanto, es necesario reinventar la escuela y sus prácticas. La escuela, la enseñanza, el aprendizaje y, demás elementos que configuran la escenografía escolar, deben ser acordes con las necesidades educativas de los niños/as que se desenvuelven en su cotidianeidad en el escenario contemporáneo, con unos intereses concretos y en unos contextos determinados. La educación, tal y como nos advierten Roblizo, Sánchez y Cózar (2015), debe ir en la misma dirección que los procesos de transformación social y cultural, generados en torno a la tecnología.

Esto conlleva que la función del docente sea preparar el contexto y las situaciones de enseñanza-aprendizaje lo más auténticas posibles para ayudar al alumnado en la adquisición de un aprendizaje relevante y conseguir dicha transformación. Esto hace necesario que posea una actitud crítica y reflexiva, que favorezca en el alumnado la toma de conciencia respecto a los problemas de la sociedad, la construcción de valores y el desarrollo de una identidad moral y cívica (Trujillo y Raso, 2010).

En el actual entorno educativo, donde el conocimiento se ha convertido en la principal fuente de riqueza y las TIC las herramientas más eficaces para su producción y difusión, el profesor/a debe ser competente digitalmente para hacer un adecuado uso de la tecnología en el proceso de enseñanza-aprendizaje, puesto que es la mejor manera de capacitar a su alumnado en el uso de las mismas (Rangel, 2015).

Existen diferentes estudios que muestran la presencia testimonial y aislada de las TIC en las actividades que se desarrollan en los centros educativos (Paredes, Guitert & Rubia, 2015), es más, se podría afirmar que su introducción está siendo marginal, puesto que se centra más en usos tradicionales que en socioconstructivistas del aprendizaje (Teo, Chai,

Hung & Lee, 2008; Mcvee, Bailey & Shanahan, 2008). Los principales usos que hace el profesorado de las tecnologías en el aula son: explicar con la pizarra digital, hacer ejercicios en línea, usar el procesador de textos y buscar información en internet (Área, Sanabria & Vega, 2013).

Dichos usos no dejan de ser estrategias o técnicas instrumentales para seguir impartiendo una enseñanza tradicional. Si las TIC se introducen en el aula de manera adecuada, se ha comprobado que dicha introducción repercute directamente en los procesos educativos, concretamente en: el papel proactivo de la dirección y la cultura del centro, el fácil acceso a los recursos y las facilidades tecnológicas, la permanencia del profesorado innovador en los centros, el papel de las familias, disponer de tiempo, el reconocimiento de la innovación, romper con los espacios y tiempos curriculares, replantear las metodologías y los modelos de evaluación de los estudiantes, y la formación del profesorado (Alonso, Guitert & Romeu, 2014; Sancho & Alonso, 2012).

Como se puede apreciar, la repercusión afecta a todos los ámbitos del proceso de enseñanza-aprendizaje, siendo preciso plantear una transformación digital integral, en la que el docente asuma el rol de "trabajador del conocimiento" (Area, Gros & Marzal, 2008).

Cambio del rol docente

Ante las nuevas demandas educativas que se plantean, el docente ha dejado de desempeñar el papel de experto en contenido para convertirse en guía, orientador, facilitador de contenido, consultor de información, colaborador en grupo, proveedor de recursos, supervisor académico, diseñador de medios... en definitiva, en facilitadores de aprendizajes (Cabero, 2003; Cózar & Roblizo, 2014).

Esto solo será posible si el profesorado integra las TIC de manera adecuada en el acto educativo, pasando de su función como TIC a TAC (Tecnologías del Aprendizaje y el Conocimiento) (Cabero, 2014a; Sancho, Ornellas, Sánchez, Alonso & Bosco, 2008). Las TAC deben ser un medio para conocer mejor la sociedad y poder preparar al alumnado para ser feliz en ella (Gutiérrez, 2008). Aunque la actitud del profesorado es positiva, todavía se sigue produciendo una introducción marginal que pone en evidencia como la competencia digital docente se debe convertir en una de las competencias básicas del profesor/a del siglo XXI (Cózar & Roblizo, 2014).

Necesaria transformación en la formación docente

Las TIC deben ser un medio en la formación docente, no un fin en sí mismas, por lo que su desarrollo competencial debe estar encaminado a la adquisición de tres dimensiones: disciplinar, pedagógica y tecnológica (Cabero, 2014b; Gallego, Gámiz y Gutiérrez, 2010; Hernández, 2008; Marquès, 2008; Roblizo, Sánchez & Cózar, 2015).

Actualmente tanto en la formación inicial, como en la formación permanente, se observa como el profesorado posee una menor formación pedagógica con respecto a la formación tecnológica de la competencia digital (García Valcárcel & Tejedor, 2010). Ya existen estudios que demuestran que es necesario un cambio respecto al contenido necesario para que el profesorado desarrolle la competencia digital. Dicho contenido lo concretan en: visión del papel de las TIC en el aprendizaje del siglo XXI, condiciones para darse cuenta del potencial de múltiples TIC para atender las necesidades individuales de los estudiantes, mejor comprensión de las relaciones entre aprendizaje informal y formal, necesidad de modelos de liderazgo y aprendizaje docente para implementar exitosamente las TIC, el potencial de las TIC en el trabajo para la equidad social y conocer los beneficios de las inversiones en TIC (Voogt, Knezek, Cox, Knezek & ten Brummelhuis, 2013).

Es necesario una nueva "realfabetización digital" del profesorado (Gutiérrez, 2008) para conseguir la capacitación en las tres dimensiones planteadas anteriormente, y que afecte a todos los componentes del proceso educativo: gestión, comunicación, currículum y evaluación de los procesos de aprendizaje (Area, Gros y Marzal, 2008). En este sentido, ¿qué competencias digitales debe tener un docente? Area, Gros y Marzal (2008) las estructuran en las siguientes áreas (Tabla 1):

Tabla 1.
Competencias y áreas que configuran la competencia digital

Competencias	Áreas
Competencias básicas en el manejo de las TIC	- Uso del ordenador como una herramienta personal para el trabajo como profesor. - Uso de diferentes redes.
Competencias colaborativas con el uso de las TIC	- Contribuir al desarrollo del conocimiento. - Trabajar sistemáticamente en procesos de aprendizaje usando entornos virtuales. - Utilizar diferentes métodos de trabajo con TIC.

Competencias pedagógicas y didácticas	- Planificar, completar y evaluar un proceso integrado de TIC en la enseñanza. - Reflexionar sobre el proceso de aprendizaje con TIC. - Relatar el desarrollo de una escuela con relación a la aplicación de las TIC .

A estas competencias Sancho et al. (2008) añade las competencias para la docencia virtual, las competencias socioculturales y las competencias comunicacionales a través de las TIC.

El desarrollo de todas estas competencias hace imprescindible apostar por un paradigma sociocrítico, ecológico e integrador tecnológico de formación del profesorado (Trujillo y Raso, 2010). Éste posibilita la formación de un docente digitalmente competente que no sólo maneja un determinado programa o entorno informático, sino que revisa su visión respecto a cómo aprende el alumnado en un mundo saturado por la tecnología, se replantea el para qué, qué, cómo de la educación, se cuestiona los tiempos y espacios escolares, así como el papel del alumnado y su rol en el proceso de enseñanza-aprendizaje (Sancho et al., 2008).

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ESTIMULAR EM CASA A VONTADE DE APRENDER: UMA EXPERIÊNCIA

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Resumo

A educação inicia no seio familiar e visa à socialização, aprendizagem e incorporação de valores éticos e morais. Essa relação, atualmente, tem sofrido influência das tecnologias digitais. Frente a esse contexto, realizamos um estudo de caso, de natureza descritiva e exploratória, com abordagem qualitativa, que objetivou identificar se os hábitos e costumes vivenciados no seio familiar têm contribuído para que a criança tire partido do potencial educativo dessas ferramentas e desenvolva o Pensamento Computacional. Participaram uma criança de 7 anos e seus pais. Os dados consistiram nas respostas dadas pelo pai a um inquérito e por episódios que, gravados em vídeo pela família, contam com a participação ativa da criança que assume papel de "apresentadora" de determinadas tecnologias. Os resultados apontaram que as tecnologias utilizadas em casa possibilitam o maior envolvimento entre pais e filhos, seja para passar mais tempo juntos ou para a realização dos deveres escolares, colaboram para o desenvolvimento da autonomia da criança e não interferem nas outras atividades realizadas por ela. Também mostraram que ocorreu o desenvolvimento cognitivo da criança participante da pesquisa no que diz respeito à comunicação das ideias e aos variados termos técnicos, bem como ao seu desenvolvimento nas explicações sobre a tecnologia apresentada.

Palavras-chave: Tecnologias digitais, tecnologias na infância, Pensamento Computacional.

1. Introdução

A sociedade vive, atualmente, sua terceira onda a qual acarreta mudanças em toda a esfera social. A família não se encontra imune a essas transformações, uma vez que os modelos familiares são corolário das transformações sociais, econômicas e políticas. Prova disso é a relação – diferente dos tempos de outrora – que as crianças estabelecem, no seio familiar, com as tecnologias digitais. A grande maioria dos pais oferece condições para que as crianças tenham acesso a algumas tecnologias. Diante do imenso desejo das crianças de dedicarem grande parte do tempo a mexer em dispositivos, como *smartphones, tablets,* computadores e *videogames*, vemos uma crescente preocupação em como rentabilizar esse precioso tempo despendido por elas, torná-lo produtivo e contribuir para o seu desenvolvimento. Temos ciência de que os filhos tendem a imitar os comportamentos dos pais e, nesse sentido, acreditamos que os hábitos familiares possam influenciar positiva ou negativamente na forma de utilizar as tecnologias digitais e tirar partido do seu potencial. Sob essa perspectiva, a função dos pais, seja no acompanhamento e na instrução, pode ser o grande diferencial.

Segundo Brito (2017), na literatura, há vários estudos que se ocupam em identificar a influência que os pais exercem sobre os filhos no que diz respeito ao uso das tecnologias digitais. Isso porque o convívio familiar constitui um ambiente propiciador de vivências onde pais e filhos compartilham momentos de integração, incorporando hábitos e valores. Uma família em que os pais têm uma proximidade grande com as tecnologias e as usam como meio para fortalecer seus laços, e não como elemento capaz de substituir o contato face a face, poderá contribuir para criar uma cultura digital nas crianças desde a mais tenra idade (Franzen, 2000; Nikken e Schols, 2015). Outro fator que pode contribuir para a criação dessa cultura diz respeito ao nível acadêmico dos pais que, por sua vez, influenciam sobremaneira o comportamento e as percepções da criança sobre a importância do uso das tecnologias (Brito, 2017).

A percepção mencionada por Brito (2017) vai além do entretenimento, porque pressupõe que os pais influenciam o uso das tecnologias como ferramentas cognitivas que auxiliam a desenvolver o raciocínio, a criatividade, a capacidade de resolução de problemas, as habilidades analíticas, enfim, uma série de competências que constituem o Pensamento Computacional (Wing, 2000), de fundamental importância para inserir as crianças, algumas delas nativas digitais (Prensky, 2001), num mundo globalizado e em constante transformação.

O Pensamento Computacional inclui "uma série de ferramentas mentais que refletem a amplitude do campo da Ciência da Computação" (Wing,

2006, p. 33). Tradicionalmente definido como um processo de resolução de problemas, por meio dele busca-se incorporar atitudes e habilidades que permitem solucionar problemas do cotidiano e científicos com métodos procedimentais da Ciência da Computação. Assim, exige-se do aprendiz a habilidade de decifrar problemas complexos, ambíguos e abertos; persistência e determinação para lidar com a dificuldade dos problemas e das habilidades para se comunicar com outras pessoas a fim de se alcançar um objetivo em comum (Cross, Hamner, Zito & Nourbakhsh, 2016; Ferri & Santos Rosa, 2016).

Considerado uma habilidade fundamental para todos, não apenas para cientistas da computação, o Pensamento Computacional "se tornará enraizado na vida de todos quando palavras como algoritmo e pré-condição fizerem parte do vocabulário de todos" (Wing, 2006, p. 34). Mas, como fazer com que isso se torne uma realidade? Por qual meio? Em que situações/contextos? Uma resposta a estas perguntas está na sua inclusão em contextos educacionais, formais ou não formais, sendo este último o contexto analisado no presente artigo, no qual apresentamos um estudo realizado com uma família que, por ter grande proximidade com as tecnologias digitais, vem incentivando a filha a explorar algumas ferramentas.

Deste modo, o referido estudo teve como objetivo identificar se os hábitos e costumes vivenciados no seio familiar têm contribuído para que a criança tire partido do potencial educativo dessas ferramentas no sentido de desenvolver o Pensamento Computacional, tão importante para inserir os cidadãos na sociedade do século XXI, com destaque à criatividade e à capacidade de comunicação e de resolução de problemas.

O artigo está dividido em três seções que se sucedem essa introdução. Na seção seguinte, apresentamos o referencial metodológico utilizado no estudo. Continuamos com a discussão dos dados e, por fim, tecemos as considerações finais.

2. Processos Metodológicos

A investigação desenvolvida – de caráter descritivo e exploratório – seguiu, preferencialmente, uma abordagem qualitativa, ou interpretativa, visto que procuramos mais a compreensão do que a explicação dos fatos (Bogdan & Biklen, 1994), ou seja, estivemos mais preocupados com os processos do que com os produtos resultantes da pesquisa (Erickson, 1986).

Em termos estritamente metodológicos, o plano de investigação foi um estudo de caso e teve, como principal objetivo, compreender uma situação particular que envolveu um estudo intensivo e detalhado dos "entes" envolvidos (Bogdan & Bilken, 1994; Coutinho, 2011; Yin, 2015) ou seja, no caso específico do estudo, foi investigar como os hábitos e costumes da família contribuíram para que a criança desenvolvesse o Pensamento Computacional a partir do uso de diferentes tecnologias.

Como instrumento de recolha de dados, optamos pela utilização de um inquérito eletrônico, elaborado no *Google Forms* e direcionado aos pais da criança. O inquérito continha 18 questões (abertas e de múltipla escolha), por meio das quais buscamos conhecer as tecnologias e o uso dessas tecnologias pela criança, bem como compreender o papel dos pais nas suas escolhas e práticas.

O inquérito possuía três seções. A primeira – que objetivava caracterizar a amostra – contemplava sete questões de escolha múltipla, relativas às seguintes variáveis: gênero, faixa etária, tecnologias existentes no lar e frequência com que os pais usavam as tecnologias em casa.

Já a segunda seção visava identificar se os pais tinham conhecimento das tecnologias utilizadas pelo seu(sua) filho(a) e também se eles auxiliavam o(a) filho(a) na escolha. Era composta por uma questão fechada e cinco questões abertas. Ainda, disponibilizava uma pergunta de tipo escala de *Likert*, com sete proposições relativas à percepção dos pais acerca da importância das tecnologias no processo de aprendizagem e à forma como monitoravam o seu uso pelo(a) filho(a). Das sete questões, duas foram formuladas na forma negativa e cinco na afirmativa de maneira a evitar padrão de resposta (Pinedo, s/d). A escala de *Likert* oferecia opções de resposta em cinco pontos de grau de concordância/discordância que variaram entre o Desacordo Total e o Acordo Total.

Por fim, a terceira seção – composta de quatro questões abertas – tratou, mais especificamente, da percepção dos pais sobre que tecnologias seriam importantes para a faixa etária de seu (sua) filho(a). Posteriormente, complementamos o estudo principal com um estudo secundário, por meio do qual buscamos analisar os vídeos feitos pela família (Quadro 1) e por ela publicados em um canal do *YouTube*. A nossa intenção, com essa análise, foi obter informações adicionais sobre a evolução do desenvolvimento do Pensamento Computacional da criança.

2.1. Tratamento dos dados

Para a análise dos itens das respostas dadas no inquérito, usamos técnicas de estatística descritiva, para a tabulação e o cruzamento de dados, e do *Microsoft Office Excel,* para a criação dos gráficos e tabelas. Nos itens em escala de *Likert*, utilizamos uma escala de cinco graus de concordância que variaram do Discordo Totalmente ao Concordo Totalmente. A elas atribuímos as seguintes correspondências em valores numéricos: 1= Discordo Totalmente; 2=Discordo, 3= Nem Discordo nem Concordo, 4= Concordo e 5= Concordo Totalmente. Para a interpretação dos valores médios globais obtidos a partir dos itens dessa escala, estabelecemos o seguinte critério: Valores entre 1 e 2,5 – denotam uma opinião de discordância; Valores entre 2,6 e 3,5 – são interpretados como uma opinião/posição neutra; Valores iguais ou superiores a 3,6 – denotam uma opinião de concordância.

Já para a apreciação dos vídeos do *YouTube*, recorremos à análise de conteúdo. Segundo Bardin (1997) e Esteves (2006), esse tipo de análise compõe um conjunto de instrumentos metodológicos para análise de "discurso" (conteúdos) bem variados. Pode ser aplicado a tudo que é mencionado em entrevistas, declarações ou qualquer coisa que é escrita em jornais, livros, textos websites e/ou na análise de imagens de filmes, desenhos, pinturas, cartazes, televisão e toda a comunicação não verbal: gestos, posturas, comportamentos e outras expressões culturais (Ferreira, s/d). De uma forma geral, a análise de conteúdo é um conjunto de técnicas que analisa as comunicações (Bardin, 1997).

3. Apresentação e análise dos resultados obtidos

Fazemos a apresentação e a análise dos resultados obtidos em duas etapas. A primeira se refere ao levantamento realizado por meio de inquérito e, a segunda, à análise dos vídeos.

3.1. Inquérito

Inicialmente, buscamos identificar o perfil da família e os tipos de tecnologias utilizados por eles em sua residência, conforme já mencionado. O inquérito aplicado à família foi respondido pelo pai da criança.

De acordo com os dados, a família investigada pertence à classe média. Os pais possuem nível superior. O pai é formado em Informática, com mestrado em Informática, e a mãe é graduada em Enfermagem. A criança é do sexo feminino e tem sete anos de idade. Atualmente, estuda no segundo ano do Ensino Fundamental I.

Em relação aos tipos de tecnologias digitais e como são utilizadas pela criança, foram indicados o *tablet*, o *smartphone* e o *notebook*. Por meio desses dispositivos, são utilizados aplicativos educacionais com o objeti-

vo de aprender algo novo ou criar vídeos sobre o que foi aprendido, como mostra o recorte a seguir da fala do pai:

> Em todos são utilizados aplicativos de cunho educacional. Desde aplicativos que ensinam palavras em inglês, matemática, lógica... Estamos utilizando bastante o site "hora do código" [...]. Recentemente começamos a documentar algumas atividades gerando pequenos vídeos para o youtube.

A possibilidade de obter aplicativos educativos gratuitos cria oportunidades e vantagens de acessar informações que, há alguns anos, não era possível acessar. Nesse sentido, as crianças têm oportunidade de aprender com o que é oferecido pela web, ao mesmo tempo em que buscam criar, produzir e editar os seus próprios vídeos onde apresentam o seu universo infantil (Tomaz, 2017).

A criança participante deste estudo tem acesso a diferentes tipos de software, como, por exemplo, a hora do código (*Frozen, Moana, CodeCombat, CodeMonkey, RunMarco, LigthBot*), silente teacher, Monster high dance, mbot, tinker, scratch, mondly, entre outros aplicativos de personagens, como *Barbie* e *Caillou*. De acordo com as respostas do inquérito, o uso das tecnologias digitais pela criança sempre ocorre com a presença e participação dos pais. Sua utilização também é restrita, ocorrendo, aproximadamente, uma hora por dia e sempre após a realização dos deveres de casa.

A preocupação dos pais em controlar e restringir a utilização das tecnologias pela criança se apresenta por alguns fatores importantes e que devem ser considerados. Primeiro, para ensinar, participar e acompanhar o desenvolvimento da criança no uso das tecnologias e, segundo, para evitar conteúdos inadequados ou impróprios frente aos riscos expostos pelo uso da Internet.

Relativamente aos resultados obtidos nos sete itens da escala de *Likert*, no seu conjunto, elaboramos o Figura 1, representado com base nos valores das médias ponderadas respectivas.

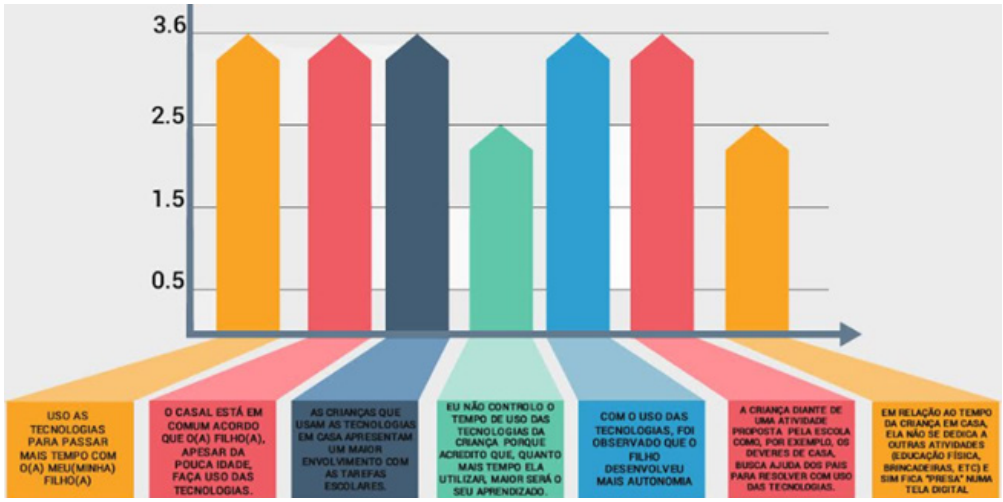

Figura 1. *Percepção dos pais em relação ao uso das tecnologias, em casa, pela criança.*

De acordo com a Figura 1, as proposições que obtiveram grau de concordância de 3,6 foram "o uso das tecnologias é um meio para passar mais tempo com a filha"; "o casal concorda que a criança faça uso das tecnologias digitais, apesar da pouca idade"; "acredita que as crianças que usam tecnologia têm um maior envolvimento com as tarefas escolares"; "com o uso das tecnologias foi observado que a filha desenvolveu mais autonomia" e "a criança diante de uma atividade proposta pela escola como, por exemplo, os deveres de casa, busca ajuda dos pais para resolver com uso das tecnologias".

Na inversa, os itens também registraram um grau de concordância, ou seja, "eu não controlo o tempo de uso das tecnologias da criança porque acredito que, quanto mais tempo ela utilizar, maior será o seu aprendizado (2,5 revertido fica 3,6) e "em relação ao tempo da criança em casa, ela não se dedica a outras atividades (educação física, brincadeiras, etc) e sim fica "presa" numa tela digital (2,5 invertido fica 3,6).

Em relação aos dois últimos itens (inversa), ficou claro que o pai controla o tempo de uso e não acredita que quanto mais tempo a filha usar as tecnologias, maior será seu aprendizado. Ponderamos que esse resultado se deva ao fato de que o pai prima por uma equilibração de uso das tecnologias para que a criança exerça outras atividades que também contribuam para o seu desenvolvimento físico, psicossocial e afetivo/emocional. Isso é comprovado, na resposta que dá à questão seguinte, na qual enfatiza que a criança despende seu tempo com outras atividades, como brincadeiras, educação física, etc.

Em síntese, as afirmações do pai reforçam os resultados obtidos nas questões anteriores, mas também apresentam algumas de suas percepções frente ao uso da tecnologia utilizada pela criança. Entre os aspectos positivos, destacamos que as tecnologias digitais utilizadas em casa possibilitam o maior envolvimento entre pais e filhos, seja para passar mais tempo juntos ou para a realização dos deveres escolares, colaboram para o desenvolvimento da autonomia da criança e não interferem nas outras atividades realizadas por ela. Isso porque a criança vê como uma brincadeira composta por desafios que precisa vencer, tornando a atividade mais aliciante e motivadora.

3.2 Vídeos

Os vídeos possuem temáticas diversificadas e são publicados em um canal do *YouTube* criado pela família, denominado "*AmandaOn: kid-ed-tech*". Geralmente, a criança assume o papel de apresentadora e explica o funcionamento de um aparelho, como a "tomada inteligente", apresenta o funcionamento de um sistema montado com arduíno, de alguns brinquedos (bonecas, robôs, brinquedos educacionais que funcionam com energia solar etc.), faz entrevistas, ensina jogos matemáticos e, ainda, dança balé e joga *PlayStation*.
Para nossa análise, selecionamos 13 episódios que estão relacionados ao uso direto de tecnologias (Quadro 1) para, assim, verificar indícios do desenvolvimento do Pensamento Computacional e de habilidades de programação.

Quadro 1
Episódios da AmandaOn que apresentam uso de tecnologias

Episódio	**Tema abordado**	**Episódio**	**Tema abordado**
AmandaOn - ep.00 (1min 38s)	Automação residencial	AmandaOn - ep.08 (3min 08s)	Arduino carrinho 2wd controlado por smartphone
AmandaOn - ep.01 (2min 42s)	Tomada inteligente	AmandaOn - ep.14 (1min 54s)	unboxing Mi Max 2
AmandaOn - ep.03 (8min 12s)	Entrevista sobre tradução de jogos	AmandaOn - ep.18 (3min 46s)	Google Home e Alexa
AmandaOn - ep.04 (2min 30s)	Arduíno com comando de voz usando rede wireless	AmandaOn - ep.19 (6min 43s)	Programação para crianças Code.org
AmandaOn - ep.05 (1min 58s)	Pensamento Computacional: contas com grampos de roupas	AmandaOn - ep.20 (3min 22s)	Participando da CampusParty11 em São Paulo
AmandaOn - ep.06 (2min 15s)	Copos matemáticos	AmandaOn - ep.25 (1min 48s)	Energia solar
AmandaOn - ep.07 (2min 13s)	Arduíno com comando de voz via bluetooth		-

Fonte: Canal AmandaOn (https://goo.gl/E4FTBG)

Os episódios são todos gravados e editados pelo pai da criança e, na maioria dos casos, possuem menos de 5 min de gravação, com exceção do ep.03 e do ep.19. Nesses dois episódios, a criança mostra muita desenvoltura tanto para elaborar questões para a entrevista, bem como para resolver e explicar os problemas propostos por meio de programação no *Code.org*. Aprender a programar para resolver os problemas propostos pelos jogos é algo divertido para a criança (Brito, 2017).
Destacamos que, por meio dos vídeos analisados, ocorre o desenvolvimento

cognitivo da criança no que diz respeito à comunicação das ideias e aos variados termos técnicos, bem como ao seu desenvolvimento nas explicações sobre a tecnologia apresentada. Termos como *QRCode, wifi, bluetooth,* navegador e *Android* já fazem parte do seu vocabulário, diferente do que ocorre com crianças que possuem a mesma idade. Observamos, também, que, nos primeiros episódios (do ep.00 ao ep.05), houve mais cortes entre as frases e que, com a produção de novas filmagens, a criança passou a ter mais segurança e facilidade em suas apresentações, indícios estes do desenvolvimento do Pensamento Computacional.

4. Conclusões

A família, nos tempos atuais, constitui um pilar de fundamental importância na forma como as crianças usam as tecnologias digitais. Com orientação, a criança passa a utilizar essas importantes ferramentas como uma forma de entretenimento, associado à possibilidade de construir seu próprio conhecimento e desenvolver competências tão necessárias para intervir num mundo de forma crítica e exercer com maestria sua cidadania.

Com o contato com as tecnologias digitais desde a infância e com sua utilização de forma orientada, as crianças não só aprendem os conceitos matemáticos ou de lógica, mas também desenvolvem um conjunto de atitudes e habilidades que abarcam estratégias para o seu desenvolvimento cognitivo, social e educacional.

São atitudes que iniciam no seio familiar e que se refletirão em toda a vida da criança, no sentido de torná-la apta a intervir numa sociedade que, a cada dia, se torna mais competitiva e que requer pessoas com grande capacidade de comunicação, de colaboração e para aprender ao longo da sua existência.

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THE CHALLENGES TO PLAN AND DEVELOP PEDAGOGICAL PRACTICES INVOLVING DIGITAL WRITTEN CULTURE IN CHILDHOOD EDUCATION

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Abstract

Nowadays children are part of the digital culture (Cassany, 2002), using its supports and involving themselves in different uses of digital written culture (Chartier, 2011, 2016). Are teachers considering these uses in preschools? How can we create teaching proposals that attend the learning conditions of young children? How do children deal with the devices, languages, and the particular uses of digital written culture? This text aims to reflect on the processes to incorporate digital technologies in the development of pedagogical activities of preschool teachers from two public schools in Brazil. The data was collected during a research done with four teachers of four to five-year-old children. The activities proposed were developed through a collaboration of the researchers and the teachers, considering their teaching demands and the children's development. The results show that the teachers started to notice the importance of using digital technologies in the processes of appreciation of written culture. On the other hand, children are stimulated to become authors and to understand the digital support as one more instrument to think and interact with society.

Key words: digital written culture, childhood education, teacher training.

Introduction

Digital technologies changed the practices of written culture that were confined to the reading and writing developed by hand or on a printed support (Cassany, 2002) and these changes have reverberated on the broad use of semiotic resources, considering that the verbal resources were previously more used (Kress, 2003).The transformations of textual supports led to different ways to appropriate the written culture and should have also provoked changes in teaching, as it inaugurates new textual genres, gestures and behaviours of reading and writing (Chartier, 2011). Anne-Marie Chartier (2016) points to the need of considering reading in its historic perspective so we can analyze how different texts and forms to read are related to the offer of texts and their production/ reproduction. In this context, it is important to know how schools, especially preschools, are dealing with those changes that, according to Chartier (2002), are simultaneously a revolution on the production techniques, as well as on the ways to read and write, and their supports.
In Brazil, it is still recent the right to children's education. Its obligation since the age of 4 years old had led to a series of debates on the relation between childhood and schooling (Luiz, Marchetti & Gomes, 2016) In this context, the discussion in the country around the experiences involving written culture, since preschool, has been tense, as there is the fear of literacy anticipation (Brandão & Leal, 2011). In the text of the Brazilian Common Curriculum Nacional Base for childhood education (Ministério da Educação [MEC], 2017), the curriculum is organized around 'fields of experiences', in one of them, called "Listening, speaking, reasoning, and imagining", some objectives involve the handling of supports such as books, magazines, and tablets, and the recognition and manipulation of different textual genres and their uses. They also highlighted in the document the diversity of languages and the orality aspects that should be emphasized in childhood education. Therefore, the polemic around the curriculum for childhood education is centered much more in the content and the fear for a premature literacy (Correa, 2010; Luiz, Marchetti, & Gomes, 2016; Albuquerque & Leite, 2016) than the supports used to insert the children in the literate world. However, the debate on the relation that young children can establish with written digital culture in a school situation is still new in Brazil (Santos & Braga, 2012). Therefore, we need researches that intersect childhood, and the uses and effects of digital technologies.
We understand digital written culture as the practices, habits, values, and behaviors, related to reading and writing in digital support, through different digital interfaces (Cassany, 2002). There are specific textual genres of this culture, such as email, chat, memes, tweets, and also literature, which has appropriated itself of multimodal resources made available by digital technology (Kress & Bezemer, 2009). This new type of literature

has experimented with languages and semiotic resources that go beyond the verbal and the image and, as they are interactive (Costa, 2003) they demand an active participation of the reader. In digital literature, the process of creation uses, since its origin and conceptualization, the available ways and resources of the digital culture (Hayles, 2009; Torres, 2004). Another type of work, considered a remediation (Bolter & Grusin, 2000) of printed works, called digitalized literature, is created, in general, to be reproduced in paper, but can also be read on the screen. On both types of work, see different levels of multimodality and interaction. These reading and writing possibilities require types of knowledge from the printed written culture and also new types of knowledge, so that the child can answer the demands of digital written culture.

This article aims to reflect on the process to incorporate digital technologies through a proposal of in-service teacher training and the development of reading and writing activities of preschool teachers in two Brazilian public schools. These activities revolved around the valorization and understanding of digital written culture by children between the ages of 3 and 5 and their teachers and the experimentation of various resources, through the pedagogical uses of computers, tablets, cell phones, video cameras, apps, software programs, and the Internet.

In-service teacher training and activity planning

Currently, there is not in Brazil a national policy for in-service teacher training that allows a reflection and action around the use of digital technologies and the Internet in schools and for very young children. This new reading and writing support demand a reorganization of teachers' actions regarding written culture (Glória, 2011; Glória & Frade, 2015; Frade, Glória, Bicalho, Araújo & Garcia, 2018). We see a mismatch between the teachers' belief that they should wait for the children to read and write to develop practices involving digital written culture (Araújo, 2013) and the early use of digital mobile devices by children. In Brazil, 60% of children between 4 and 6 years old use their parents' smartphones and 22% of them have their own smartphone (Panorama Mobile Time/Opinion Box, 2017).

The teachers should understand that there is no need of prerequisites, such as know how to read and write, to develop practices of digital reading and writing, as well as to know the pedagogical possibilities to experience those practices with young children. This could be better developed in the pre-service training, but digital literacy is a very recent theme in the curricula of the teaching majors in Brazilian universities. In a research developed in Australia, Thorpe et al. (2015) point that preschool teachers did not feel at ease to use digital technologies and the internet with young children in the classroom. A similar result was found

with teachers who participated in our research before we started the in-service training, every fortnight, in the school they taught. Before the research, they reported that the planning of the activities done in the computer lab was done by the computer teachers and they only helped them to put into practice. The testimony of a teacher after the training is very clear: "in the beginning I was a person, you know...more insecure. I depended more on others opinions [...] we have never thought about this. About teaching reading and writing with digital technology, you know!". It is through pre and in-service teacher training that we produce a reflection on the new pedagogical practices with digital written culture (Thorpe et al., 2015), on the reorganization of times and spaces, the concept of learning that allows children to build knowledge on digital culture, and the new roles played by teachers and students that use digital support.

Methodology

Answering these challenges and aiming to investigate the teaching of reading and writing with digital technologies and the internet, we proposed an intervention research in two public preschools in Brazil, whose methodology was based on the planning of activities to be developed with children between 4 and 5 years old in the computer lab, using the content to be studied with their classes, and a work of data analysis with the teachers. The research with the for teachers (two with 4-year-old students, and two with five-year old ones) took place in different schools and cities, one in a big metropolis and another in a city in the countryside. Even though these institutions are part of the public education system, they have specific education secretaries and their own teaching proposals. Therefore, from a qualitative research perspective, we could collect pertinent and significant data that pointed to several analyses; among those we chose a sample to be presented in this article. Weekly, the researchers and four teachers who were participating in the research (two in each class) studied subjects related to written digital culture and planned activities for four classes of children between the ages of 4 and 5 years old in a computer lab, connected to the activities in the regular classroom. We created activities using different genres and digital environments, aiming to stimulate a greater insertion of children in written culture and the reflection on the alphabetic written system of Portuguese. The planning took into consideration the development and demand of the children, besides allowing significant experiences of collaboration in the building of knowledge on the social uses of digital written culture, developing also the sense of ethics, and learning Internet safety. The literacy events that took place in the computer lab were / recorded and analysed by the teachers, during a reflection moment. We tried to get closer to the teachers to promote a sense of belonging to

the research team. This methodological decision has positively affected the procedures as we had the freedom to present, to the school, the activities made by the participant teachers, as well as discuss individually with them the development of those activities so as to improve them throughout the research. The scientific procedures used to collect data were: observation, field notes, class recording, interviews with the teachers and some students. All procedures followed the ethical standards of research, following the guidelines of the Ethics Committee of *Universidade Federal de Minas Gerais*.

We noticed that, during this process, the teachers started to understand the computer lab as another teaching environment of certain uses of written culture. As the digital devices are not in the classroom, they have also understood the need to integrate the pedagogical actions of both teaching environments. We observed the development of teachers' autonomy in planning and executing the activities. By the end of the research, the teachers were the ones helping the researchers. As we can see in the final interview with Dayse, a teacher of 4-year-old children:

[...] I didn't consider myself a source of research, but as a researcher. As I was searching the resources I would use, I could see at the kids what they wanted to learn and I was open to a real liberation, you know, of the resources that I thought were the only ones. It was as if a whole array was open to me and I could choose these options on it and I knew that behind this array, beyond it, they would be more.

The protagonism due to the research actions shows that the proposal of an in-service and in-site training, based on planning and analysing their practices anchored by theoretical studies, allows a professional development based on action/reflection/action (Schön, 2000).

Practices involving digital written culture in Childhood

In this section, we analyze two literacy events: the first of digital and digitized literature reading in the city of Belo Horizonte, and the second, the production of an oral text, developed in a school in the city of Governador Valadares.

The reading of digital and digitized literature

The activity described below dealt with digital and digitalized literature works, collectively read through a Datashow, with five-year old children. The first work was *Aventura nas Alturas,* by Christiane Àvila, which is part of the archive of digitized literary works on the website Escola Games So as all children could follow the text, the teacher would click in "read it to me" and the children could follow the reading through the voice of the narrator and an orange highlight in every page read. To change the page the teacher would click on an arrow and the screen would automatically go to the next page.
After reading in the website, the children read the Spanish work of digital literature *Bla Bla,* by Vicent Morisset , created with moving images, sounds, and few verbal resources in Spanish, which appeared only in the subheadings of the 5-part work. These characteristics allowed children, who do know the alphabetic written system and Spanish, to read. To do so, the kids needed to click on the character and other elements that would appear during the story. As it is highly interactive, it demands an active participation of the reader, as it is through the clicks that the children create the narrative. In the reading event during the research, the teacher would call one student at a time to interact with the work. The students were constantly guided on the gestures and behaviours needed. At the end, the teacher set the children in a circle to discuss their impressions

on the two types of reading and checking their overall understanding.
Due to computer problems, we did this activity twice. First, the audio was not active. The second time, the children read it with the audio, a resource used in the story to show the onomatopoeic sounds, noises, or characters' expressions. We could notice a change on how students engaged and understood the work in both situations, showing how multimodal resources allow new interpretations. With the audio on, the engagement was higher (Table 1) and they could notice information from the story that were not available without this semiotic resource, broadening the understanding of the story (Table 2). The teacher's note on the children's engagements, after the use of the audio, shows how strong was this change of behaviour:

Table 1
Excerpt of Sandra (teacher) on the class of digital literature reading

This day in the computer lab showed us how important the audio resources are and the difference they can make. We started with only the visual resource and the children's interest changed the moment we could introduce the audio resource. They got closer [to the notebook] and wanted to participate more actively in the development of the story.

We can see in Table 2 that the children described the story with details and the changes of understanding due to the use of audio, showing that they understood and memorized the sound effects.

Table 2
Transcription of an excerpt of a digital literature reading

Teacher: This story got a bit different from last time! Did you notice? What happened this time, that didn't happen last time? Researcher: What happened? What was there in the story that you couldn't see and hear in the other? Student 1: Last time, we couldn't hear anything they were saying. Teacher: Ah, you couldn't hear! Student 1: He just did like that! [Opens the arms imitating the character in the story] Researcher: Did it make a difference? Student 1: Yes, it did [makes a positive gesture with fingers] Researcher: Why? Student 1: Because each sound is different from the other. Researcher: And does the sound make a difference to understand the story? Students: Yes! [All together] Researcher: What was different with the sound? Student 2: When the voice appeared! Researcher: The voice appeared! Student 1: He fell in the hole and there was a noise close to the hole. Researcher: There was a noise, right? Student 3: And he did Blá Blá Blá Bá Blá Blá! Researcher: He was saying Blá Blá Blá Bá Blá Blá! Student 4: He was all the time doing glup...glup...glup! [shaking the head imitating the character falling] Researcher: so...I'll make you a question. What was this story about? Students: Blá Blá! [all together] Researcher: To talk, right!

See www.escolagames.com.br
See http://blabla.nfb.ca/#/blabla

As reading is multimodal (Rowsell, Kress, Pahl, & Street, 2013) when we, accidently, removed one of the semiotic resources available, we noticed the repercussion on the type of engagement, but, mainly, in the understanding of the work, as each semiotic resource has a different potential to build meaning (Kress, 2010). We can see in the class excerpt above that the children talk about the relevance of the sound in the construction of meaning of the reading and highlight parts in which certain sounds indicate important information to understand the development of the story. New researchers are needed to check the relevance of associated semiotic resources to understand the meaning of digital literary works by young children. Regarding the gestures and behaviours to read, an interviewed child reported his perception on the different demands in reading a digital and a digitalized work.

Table 3

Interview with a student after reading the digital works

Researcher: What stories did we see today? Student: Aventura nas Alturas and Blá Blá. Researcher: Are they the same? Student: No. Researcher: They are different [...] Student: Because in the first one we click and it happens...in the other we had to click for it to happen. Researcher: You see...in the computer we can also read literature in different way.

When indicating that "we click and it happens" and in the other we had to click for it to happen" the child is highlighting the need to participate in the construction of the narrative, differently from the behaviour of a reader of printed works (Chartier, 2002). This takes place, especially, in digital readings that demand a higher level of interactivity, because if the child just looks at the screen without interacting with the work, the story does not develop (Aliagas & Margallo, 2017). It is clear that, in the event of reading the work Blá Blá, the children's participation in the construction of the narrative promotes their engagement in the reading and favors the building of meaning (Dooley, Martinez & Roser, 2013). As children understand what are the gestures and behaviors needed to engage in the reading of digital works with multimodal resources (Kress & Bazemer, 2009), they become more autonomous readers, as they depend less of adult guidance to read the work.

Oral production of texts

The texts in the digital space are produced considering several elements, among those we highlight the analysis effect of the use of audio-visual resources to produce and present oral texts. We know that in preschool education, the orality and the audio-visual resources are intensely explored. In the case of the digital technology support, these elements are potentialized, as will be shown, allowing children to experiment in practical activities of textual production that take place in the school (Kress & Bezemer, 2009; Soares, 2002). Films, a documentary, a cartoon, a video clip, for example, are audio-visual texts that can be seen online. The
moving images and sounds are blended, composing a multimodal language through which you can see, listen, and click. They also demand certain gestures and behaviours, depending on the type of digital support used (Beaudouin, 2002). The digital environment allows the development of oral languages practices (Bairon, 2000) such as video making. In the activity of video making developed in the research we saw how children could express spontaneously all that can be said to a person or a group in front of a screen.

The proposal of oral text production, analysed in this topic, starts from the creation of a video with the children's participation which aimed to develop abilities of oral text production, as well as competences related to audio-visual literacy. As the children commonly used this resource at home, the use of video to develop a narrative allows an approximation to the out-of-school social practices. We had the support of the main teacher and the computer lab teacher in the preschool to do those practices of reading and writing in the computer of lab. Not all municipal schools in Brazil have a computer lab teacher, however, the preschools in which we developed the research counted with this professional, who contributed a lot to the activity, as the main teachers did not develop the
competences to deal with these pedagogical environments of digital technology during their pre-service training in university. The context of developing a class plan with the researchers, the computer teachers, and the main teachers allowed for a more effective use of the resources which opened new possibilities to use digital culture.

The interview with the main teacher and the computer lab teacher (Table 4) points to challenges of planning and executing of the activity with a class of 4 year-old children. In the excerpt bellow the teachers commented in the practice developed from a demand of the children, about animals in nature. Thus, they created the project "*Conta que eu te escuto*" in which each child recorded a video with real or made-up stories about an animal. After the production and editing, the video was presented to the kids in the computer lab at the end of each class, during a period of 3 months.

Weekly, the children listened, either through a film projector or using the computer and headphones, to the narrative of one of their classmates and shared their opinion. The testimony of the teachers who participated in the planning and execution of the activities, shown in Table 4, shows how the resources were used and the editing process, as well as the mediation done by the adults.

Table 4
Interview with teachers

Main teacher: The project "Tell me and I'll listen" is part of a broader project about animals. In it we proposed [...] that each child would create a made up story, or a known one, with an animal. Livio and I thought that using multimedia we could develop children's orality. We filmed and edited the project. **Computer lab teacher**: Actually, it was a simple production, in which we used the cell phone to film; [...], we focused on the child and later put the images in the Windows movie editor, cut some parts and created a home-made video. **Main teacher**: [...] Every week they see a video with a classmate telling a story about an animal [...] they have all been very excited about recording. **Computer lab teacher**: [...] they children use Windows, we put the video in the net, each one in their own screen watches the story with a headphone. In the end of the class, in circle, they tell what they saw [...].

Even though it was a "simple" and "home-made" video production, as defined by the computer lab teacher, the planning of this class was different, allowing children to be the authors of a digital text that, to be created, needed other semiotic resources, which go beyond the oral word (gesture, behaviour, intonation, image), broadening the concept of text, as pointed out by Kress (2003). The excerpt of an interview with one of the participant children shows the impressions over the task: "My story was about the little wolf. I made it up. I liked to make the video with teacher Sabrina. I was a bit embarrassed in the beginning, but it was okay after. I've never made a video before. I liked to see myself; I think it was good". We can see that the child assumes the position of author, and also has the opportunity to evaluate him/herself regarding the format and content of the video.

In another part of the interview, the main teacher expresses how impressed she was on the contribution of the activity to the development of children's orality, highlighting that each one wanted to tell their story better than the other, and it helped the development of a very shy student that was able to "let herself go". After this shy child recorded the

video in school, she got home and asked the mother to record another video and sent it by WhatsApp to the teacher, showing the chicks that were born in her henhouse, which appeared in her school narrative. This shows the continuation from what the student produced at home and what she lived in school, retaking the theme and the communication format.

After the conditions of textual production were adequately established, i.e.: what to say (about animals), to whom (the classmates), how (through an oral narrative using a digital support for the text), why (to communicate a narrative I know or created about an animal), it is natural that the children would feel motivated, as the teacher confirms "they have all been very excited about recording".

The interaction with the computer, the classmates, and with their own text in the screen is a very stimulating experience as it engages the child in text production, together with the multimodal resources (images, sound, screen, movement, etc.). We also noticed that this leads to changes in the way children use the language and how they incorporate and receives the digital technologies to communicate and express themselves (Rowsell et al. 2013). In the case of the 4-year old children, even if they did not directly participate on the technical production and editing of the video, they could indirectly follow this process by watching how the teachers formatted the video. Besides this, they had the opportunity to receive the classmates' praises and critics of their narratives and screen performances.

Final remarks

An environment of reflection and suggestion guaranteed in the research allowed the teachers to use the computer and other digital devices as another resource to teach reading and writing. We noticed in the research that the professionals of childhood education could not only appropriate themselves of the theoretical concepts studied, but also create significant practices of reading and writing in digital environments, contributing to the training of their peers, as well as the children's language development.

The training of teachers to deal with contemporary educational challenges involving digital technologies and the Internet is still inefficient. In Brazilian schools, which have digital resources, those are, generally, underused due to the lack of teacher training (pre-service and in-service) in this area. This is aggravated in a country of continental dimensions as Brazil with, still, great inequalities of access to technologies and Internet (Mercado, 1999; Ramal, 2002; Valente, 2007).

We saw that children from an early age have the conditions to expand the practices involving digital written culture. The digital devices add many semiotic resources (images, sounds, and others) that help young children to engage more in reading and writing activities. By reading and creating multimodal texts from an early age, children can experiment different forms of language that lead to different ways of thinking, listening, speaking, and writing, which are more and more expressive and distinct (Bairon, 2000; Kress, 2009).

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YOUNG CHILDREN'S AGENCY IN THEIR DIGITAL MEDIA USE IN THE SOCIOCULTURAL CONTEXTS OF HOMES: A CASE STUDY FROM FINLAND

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Abstract

This socioculturally framed case study investigates the agency of young children aged 2 years old during their digital media use in their homes in Finland. The study has two objectives: (a) to portray children's use of digital media in homes and (b) to identify how, if at all, children's agency manifests itself in their digitally mediated activities in the home context. The case study data were collected by means of the "Day in the Life" methodology (Gillen, et al., 2007), which entails researchers visiting children's homes and collecting observational and video data over one full day. The parents' accounts were also taken into consideration by means of an informal interview. The findings demonstrate how the children's agency manifested itself in child-initiated activities that
afforded children to make choices, and to take active, interactive and creative positions around digital media. The children's agency was mediated by the sociocultural contexts of their homes, including the nature of digital media at their disposal and the rules, objectives and social interactions between the child and adult(s). The study contributes to the present-day understanding of the sociocultural conditions of children's agency and its manifestations in their digital media use at home.

Keywords: Young children, home, digital media use, agency, sociocultural approach.

Introduction

Digital devices are increasingly permeating many children's everyday lives already from birth (Chaudron et al., 2015; Suoninen, 2014). Yet, little research exists currently on the ways in which young children use and interact with digital devices in their homes (Kumpulainen & Gillen, 2017). In this study, we aim to enlighten young children's (aged 2 years old) digital media use at home with particular interest in young children's agency. We seek to investigate the purposes of children's media use at home and how their agency is mediated through their use of digital media. The study addresses a major gap in research; at present, there is little research on young children's agency in their use of digital media in their homes, including how sociocultural contexts and relationships in the home support these agentive processes.

Understanding and researching young children's agency

Our interest in young children's agency draws on the sociocultural notions of human agency and development (Kumpulainen & Lipponen, 2010; Lipponen & Kumpulainen, 2011; Rainio, 2010; Rajala, Martin, & Kumpulainen, 2016). This is amplified by the United Nations (UN) Convention on the Rights of the Child[1], which holds that children have the right to participate and learn in society and have the freedom to express their opinions on matters that affect their lives. We also draw on the sociology of childhood by recognising children as active agents in their lifeworlds who are capable of agency (Prout, 2005). Hence, in our research, we hope to provide complementary insights into existing discourses around digital childhoods that too often position children as victims and/or passive consumers of digital media. Generating research on young children's agency in their use of digital media in home contexts and the sociocultural conditions for the emergence of agency are pivotal to understanding children's everyday lives, learning and wellbeing in the digitalised society.

In our work, we view agency as situated, relational and represented by the possibilities for acting within a setting. A child's agency can manifest itself in a social activity in which she or he initiates an idea, agrees with, elaborates on, questions, or disagrees with what someone else initiated or refrains from responding. It also depends on whether her or his action is accepted, elaborated, questioned, challenged, or ignored' (Gresalfi, Martin, Hand, & Greeno, 2009, pp. 53).

We do not interpret the child's agency as innate. Rather, it is recognised in relation to a particular subject position that is co-constructed into being in children's interactions with their lifeworlds, as embedded and mediated by the personal history of the child in that position, as well as in relation to the sociocultural resources that make the child's agency possible (Edwards & Mackenzie, 2008; Holland, Lachiocotte, Skinner, & Cain, 1998). As our previous studies point out, different contexts hold different structures of people, material artefacts, rules, objectives, time structures and social interactions that mediate children's agency (Sairanen & Kumpulainen, 2014). Hence, we approach children's agency as relational and context-dependent. Furthermore, following Prout (2005), we regard agency as never fully possessed nor developed, but always undergoing development and change (see also Greeno, 2006; Göncü &

[1] *https://www.ohchr.org/Documents/ProfessionalInterest/crc.pdf*

Perone, 2005).

The sociocultural approach underscores human agency as dialectically related both to the individual and to the activity of which the individual is a part. Human beings are seen as social agents, dependent on other people and diverse material and symbolic resources that communities have developed over time. Agency is hence closely related to autonomy and power relations in human activity and learning (Rajala, Martin, & Kumpulainen, 2016). Agency is a process that is distributed and produced between both human and non-human actors, including different artefacts, such as digital media tools and contents. Agency is regarded as a dynamic hybrid that can be researched and understood only in relation to these different entities. From this, it reasons that individual agency becomes merely a construction, as agency is always distributed, relational and context-dependent.

The sociocultural theorising advocated by our work also underscores that humans are not born as agentive beings but that agency develops through participation in collective activities. We understand the development of agency as a process of becoming, in which agency accounts for being able to contribute to, influence and change the environment, including the material conditions of one's life (Holland & Lachicotte, 2007; Vygotsky, 1978). Agency calls for experience, learning and development, as well as courage and desire for agency (Lee, 2001). According to Martin (2004), agency should be viewed at the same time as an emergent capacity of the developing person and as a characteristic of interpersonal interaction. This entails learning to control oneself by internalising cultural values, traditions and tools and equally to learn to use these cultural tools to overcome existing constraints and develop something new.

Insights into empirical research on children's agency

Although empirical research on children's agency has received increased attention in recent years (see e.g. Hilppö, Lipponen, Kumpulainen, & Rainio, 2016; Kumpulainen & Lipponen, 2010; Rajala, Martin, & Kumpulainen, 2016), there is little, if any, research on the ways in which children manifest their agency in interactions with digital media in the sociocultural context of their homes (Kumpulainen & Gillen, 2017). Generally, we lack systematic knowledge of what counts as the child's agentive action in their use of digital media and of how such agency develops.

In our earlier empirical research (Sairanen & Kumpulainen, 2014), when investigating children's sense of agency in transitioning from pre-primary school to first grade, we operationalised agency in terms of six modalities of agency, and we analysed how these modalities manifested themselves in children's multimodal accounts within and across pre-primary and primary school settings. These are, namely, 1) being able to do something; 2) knowing how to do something; 3) wanting to do something; 4) having the possibility to do something; 5) having to do something; and 6) feeling, experiencing and appreciating something (Jyrkämä, 2008). Our findings from this study illustrate the nuanced and sometimes contradictory ways in which the children related to and exercised their agency across the pre-primary school and first grade and how the sociocultural conditions and resources mediated these children's opportunities for agency.

Drawing on the conceptual work of Lipponen and Kumpulainen on agency (2011), the study of Rajala Hilppö, Lipponen, & Kumpulainen (2013) explored how students' agency was co-constructed into being in a Finnish upper secondary school based on a technology-mediated interdisciplinary and collaborative inquiry project on local bicycle conditions. In their study, they identified three different types of agency in the students' social activities; epistemic agency was evidenced in those interactions when the students were able to bring in their knowledge and experiences to joint inquiry and meaning making. Relational agency manifested itself when the students were offering or asking for help from each other. Transformative agency was realised in social activities when the students created new solutions and/or perspectives to their inquiry work, as well as when the students took concrete actions to influence and make a difference in their local cycling routes.

The study of Kucirkova and Flewitt (2018) investigated the views of education professionals and app designers on the potential of digital personalisation to promote young children's reading and play with 'smart toys'. The study reveals that a dominant theme addressed by the research participants was the potential of digital personalisation to both enhance and jeopardise children and adults' agency. Drawing on the conceptualisations of Walkerdine (1997) and Genishi and Goodwin (2008) on human identities as multiple and shifting, Kucirkova and Flewitt (2018) define agency to 'mean the features and affordances in children's use of digital media permitting them (or not) to make choices, to add content, to adopt active and interactive roles with digital features and to (re)negotiate identity' (pp. 5). The participants' discussion of agency was further operationalised into subordinate themes, including content curation, creativity, imagination, motivation, engagement, authorship, data safety and security, attention, story ownership and marketization.

Next, we turn to discussing our case study on young children's digital media use in their homes.

Study

Our study has two objectives: (a) to portray children's use of digital media in their homes and (b) to identify how, if at all, children's agency manifests itself in their digitally mediated activities in the home context. This study is part of the European-level DigiLitEY's 'A Day in the Digital Lives of Children aged 0–3' project that thrives to increase the current state of knowledge on young children's digital literacy and multimodal practices in homes and communities, including synthesising research on parental support of children's digital literacy development .

Research setting and participants

Our study is situated in a suburban metropolitan area in southern Finland with families representing middle to high socio-economic background. The study took place in children's homes and in outdoor areas constituting the child's living environments. Two children aged 2 years old, Emilia and Julia, and their families volunteered to take part in this study. The children's names are replaced with pseudonyms to assure their anonymity.

Research methods

The data were collected by means of the "Day in the Life" methodology (Gillen et al., 2007; Gillen & Cameron, 2010), which entailed researchers visiting children's homes and collecting observational and video data over one full day with a specific interest in the form of media being used, the time, the purpose and place and the social context of usage. The parents were also interviewed while being supported by a summary video of their child's day.

The data collection started with a preliminary discussion with the parents before entering the home. The first home visit included a preliminary familiarising discussion with the parent and the child and negotiating the consent to participate in the research. The second visit was the 'Day in the Life' visit, when researchers spent one full day videoing and observing the child's activities and making field notes from the beginning of the child's day of 4 to 6 hours. The researchers avoided participating in the child's activities, though in an ethical and child-friendly manner. We discussed the length of the visit and the length of the videoing with the parents, preventing the child from becoming exhausted by the visit. We also put the camera away when we noticed that the child was disturbed, e.g. getting nervous about the videoing or whenever the parents wanted us to stop. The child was not videoed either when the child was sleeping or going to sleep, eating or in the bathroom. During the final visit, we met the parents and showed them a summary video of the recording—we had both an informal discussion and a more structured interview about the video. In sum, the data corpus of our analysis consisted of the videos and observations from one (whole) day in each family home, interview data with the parents about the summary video made from the child's day and parent questionnaire data.

2 http://digilitey.eu/working-groups/wg1-digital-literacy-in-homes-and-communities

Data analysis

We transcribed the video data and used the transcriptions alongside the video data during the analysis process. We complemented the video and observation data with interview and questionnaire data. Our analysis followed an ethnographic logic of inquiry (Castanheira et al., 2009) in which the data analysis proceeds as a series of cycles and as a multi-step and multi-phase recursive analysis process. First, we investigated the entire data corpus and made content logs, that is, a time-indexed list of the child's activities over the day with and without digital media. The video and observation data analyses were amplified by the parent questionnaire and interview data. We then turned to analysing the form of media being used by the child, including the time, purpose and place and social context of usage. Next, following the idea of Gresalfi et al. (2009), we identified episodes that demonstrate children's display of agency in their use of digital media.

Next, we will illustrate purposefully identified samples from the entire data corpus derived via the so-called intensity sampling method. This entails identifying information-rich cases that manifest the phenomenon of interest intensely, but not extremely (Patton, 1990).

Results

Our results section begins by providing situated information about the sociocultural contexts of the children's homes and their everyday lives at home. This is followed by illustrations of the children's agency in their digital media use in their homes.

The sociocultural contexts of the children's everyday lives

Emilia

Emilia and her family live in a semi-detached house next to the nature and forest. Her family includes herself and a mother and father. Both parents have a master-level education, and her father is working full-time while her mother is on a parental leave at home with Emilia, soon returning to full-time work. Emilia spends her days at home and she takes part in the activities of an early childhood education (ECE) center a few times a week near home. At home, Emilia spends time in her own room and around the whole house, and she spends time outdoors in their own yard and in the forest nearby. Inside, she plays in her own room or in the living room and/or corridors. Emilia's parents have a tablet that Emilia uses with her parents and by herself. In addition, they have a TV and a laptop. Though Emilia does not have free access to the tablet, her parents tend to negotiate whether she can use the device. Sometimes, her mother may also suggest to Emilia when to use the tablet. On some days, Emilia does not use any digital devices. The parents follow the advice they received from the ECE center in regulating Emilia's screen time on the tablet. Before Emilia starts to use the tablet, her parents typically inform her of how many minutes she can use it. Her parents expressed that they did not want her to 'over use' the tablet or other digital devices, but realised that learning to use digital devices was good for Emilia. The parents were interested in what Emilia was doing with the tablet and they expressed a desire to become familiar with the contents. At times, they had a habit of watching TV together on a sofa.

Julia

Julia, her mother, her father and her younger sister all live in a terraced house in a park-like neighbourhood with their own yard and a yard shared with their neighbours. Julia is allowed to play alone in their own yard and in the front yard. She is not yet allowed to go to the housing cooperative's yard. Both parents have a master-level education, and her father is working full-time. Her mother has a full-time job as well, but at the time of our study, she was on a parental leave at home taking care of the children. Julia had access to her mother's smartphone and to a tablet. She also watched a smart TV. Sometimes she asked for access and sometimes she was asked if she wanted to use the digital devices. Occasionally, her father used an application lock so that she was unable to change the application on the tablet. Mainly, her mother did not use the lock. Before using the phone or tablet, her parents negotiate with Julia about the use and the content, as well as the duration of use. She used the devices both by herself and with her parents. Julia's parents wanted her to

use the digital media and did not feel it was harmful for her. With digital devices, they wanted to support Julia's interests: music and dancing, and they found digital media helpful for communicating with relatives and friends. Her parents also emphasised Julia's English learning via English speaking programmes and applications.

The children's use of digital media in the home

Our data revealed various uses of digital media in both Emilia's and Julia's homes. A tablet and a smartphone played key roles in both children's everyday use of digital media. The children used the devices alone or together with a parent. Both the children's parents were aware when their child was using the device, though they did not always know the purpose of the use. The children typically asked for permission to use the media, or their parent suggested the child might like to use a certain app or watch a video, for example. Neither of the children used digital media without permission. In both families, the parents had rules and restrictions for their child's use of digital media agreed upon with the children. In both cases, the children themselves also regulated their own media use according to joint rules and time restrictions. Altogether, we can summarise that in both families who took part in our study, the children's digital media use was controlled and structured.

Both Emilia and Julia used digital media for different purposes. The children used tablets for watching videos (typically children's TV or YouTube videos), playing games, searching for information and for creating sounds. The children used smartphones to watch videos—often self-made and about their own lives—as well as to take photos and to communicate with family members (including grandparents) and friends. We also found both Emilia and Julia discussing media content with a parent and showing media content to a parent and/or giving instructions to the parent about media use. We observed the children reading a text message with a parent and writing a WhatsApp/text message with emojis (also on their own). The children also made calls to their friends and family members. The children's use of digital media also included scrolling through a tablet's launch pad and wandering from an application or from a game to another, with no specific purpose from the outset.

Our data also suggest that the children's everyday lives were not only permeated by digital media, but it involved interacting and playing with adults and other children using more traditional toys and tools in the home and outside, reading traditional print-based books and picture books, drawing and cooking and doing other mundane activities in the house together with the parents. In addition, the children were found to use digital media as part of their other play activities; thus, we saw evi-

dence of hybridised activities in which old and new artefacts and technologies and online and offline worlds dynamically interact and merge (see also Marsh, 2014).

Manifestations of the children's agency in their digital media use at home

Communicating with the grandmother

Our first example demonstrates the manifestation of Julia's agency in her interest-driven use of digital media as a means of communicating with her grandmother. Julia's agency is co-constructed into being with her mother who notices from her own smartphone that Julia has received a text message from her grandmother. The grandmother has written the text message with letters and emojis. Julia's mother reads the written part of the message aloud to Julia and together they read and interpret the emojis and discuss the meaning of the message. Julia's mother gives the phone to her, leaves Julia alone and encourages her to respond to the grandmother. This encouragement leads Julia to respond to her grandmother by herself and she writes the message with emojis and sends it off from her mother's smartphone (see Figure 1). After Julia has written and sent out the message, she shows it to her mother and they read the message aloud together.

This example shows how Julia's agency was mediated by her mother and grandmother, but also by the digital media and its multimodal textual affordances (other than printed text). Julia does not meet her grandmother often, but they are in touch almost daily due to the mediation of digital technologies. Her grandmother sends her messages with emojis, which she is able to read although as she does not yet know how to read printed text and letters, and her mother reads the written parts of the messages aloud. Julia is also able to respond to her grandmother by emojis and in this way actively share narrations about her day and the latest news.

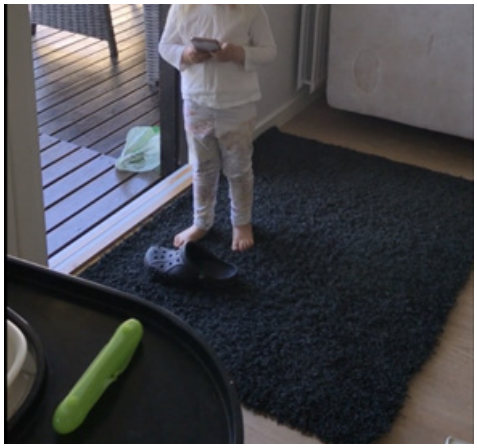

Figure 1. *Julia is writing a message to her grandmother.*

Playing with sounds

In this example, Emilia is sitting on a sofa using a music application that she has independently located whilst glancing through different applications she is allowed to search on the tablet. In this app, there are different pictures that make different sounds. First, she is just going through the pictures, tapping them one by one and listening to different sounds. Her father joins in to see what she is doing and for a while asks questions about the sounds and the app, but he eventually leaves her to make the sounds again by herself. Soon Emilia becomes distracted, and she changes places from the sofa to the floor. After this, her mother joins her to see what she is doing. The child starts to show the sounds to her mother and together they get excited about tapping the pictures and creating the sounds, and they shake their bodies to the rhythm of the sounds.

In this example, we can witness Emilia's agency in her use of a sound-making app on a tablet. The sounds make her laugh and she becomes interested in tapping the different sounds. Her mother gets excited about the sounds as well, and together they start to create sounds. Here, Emilia's agency is mediated by the sound-making app, her mother and the rules the parents have set for her usage of the tablet. The rules, that is, her parents giving her a certain amount of freedom in using the tablet, give her the opportunity to explore different applications, which results in Emilia locating a sound creation application that attracts her attention. Our example also shows how Emilia's parents are following her from some distance and that they are interested in what she is doing. They let her play with the app, and in the end her mother joins her to create sounds together (see Figure 2).

Figure 2. *Emilia is creating sounds with her mother.*

Searching for information online to make a ladybird

Our third example presents how Julia's agency is co-constructed into being with her mother in the context of her engagement in making a ladybird from cardboard with scissors. The making activity is initiated by Julia when she says that she would like to make a ladybird. Julia and her mother start to collect some materials for the tinkering. Then they decide to use the tablet to search for information online about the appearance of a ladybird. When Julia finds a picture that she likes, she starts to select the materials she needs for making the ladybird; with her mother's help, she starts to tinker. Occasionally, while making the ladybird, they go back to the picture online and discuss what would be the next step to get the ladybird ready.

In this example, Julia is using the tablet and the picture that Julia and her mother have located on the Internet to help Julia to see a picture of a ladybird (see Figure 3). Her agency is mediated by her interest to make a ladybird, the material artefacts, the tablet and her mother.

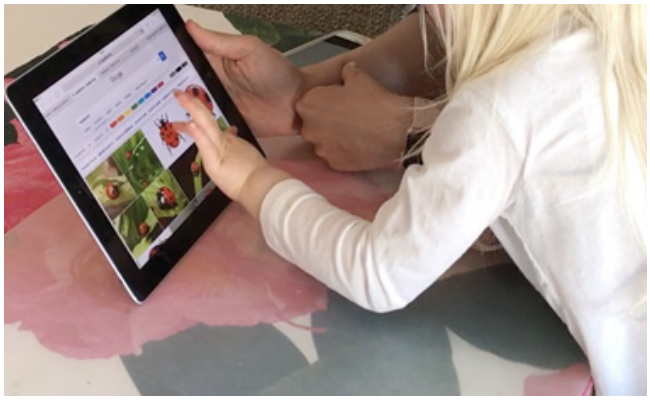

Figure 3. *Julia and her mother are searching online for what a ladybird looks like*

Discussion and conclusions

In our study, we focused our attention on investigating two young children's (aged 2 years old) digital media use at home, with particular interest in their agency and the ways in which sociocultural contexts, resources and relationships in the home supported these agentive processes. The motivation for our research stems from a recent literature review by Kumpulainen and Gillen (2017) that indicates that there is currently a dearth of research knowledge on young children's agency in their use of digital media in their homes. Generally, it appears that more attention has been given in the literature to the risks and threats of digital media in children's lives, with less attention paid to children's rights to protection, provision and participation in the digital age (Livingstone et al., 2017b; Livingstone, 2016).

Although knowledge of risks and threats to children's lives and healthy development caused by increased digitalisation are important, we also need research on how digital media and the social contexts in which it is used afford children opportunities for agency, learning and development. Research on young children's agency in their use of digital media in home contexts and the sociocultural conditions for the emergence of agency is pivotal to understanding children's everyday lives, learning and wellbeing in the digital age.

In our study, we have drawn on the sociocultural notions of human agency, the UN Convention on the Rights of the Child and the sociology of childhood that regard children as active agents capable of agency in their everyday lives. In our work, we have defined agency as situated, relational and represented by the possibilities for acting within a setting (Kumpulainen & Lipponen, 2010). From these premises, we have been able to illuminate how the children's agency in their use of digital media was mediated by the sociocultural contexts of their homes, including the nature of digital media at their disposal, and the rules, objectives and social interactions between the child and adult(s).

The child's agency manifested in our study in child-initiated activities in the social contexts of their homes that afforded the children to make choices, and to take active, interactive and creative positions around digital media. Our study also shows how the sociocultural practices and their rules and values in both families offered children opportunities to exercise their agency in their use of digital media in ways that at times are even difficult to realise with more traditional tools, such as via traditional

phone or a printed book. For instance, as our examples show, the children's agency was made possible via digital-mediation that created dynamic opportunities for multimodal communication with a grandmother in a distant location, playing with and generating complex sounds and searching for diverse online information for tinkering a ladybird. All these digitally mediated activities that we identified in the children's homes allowed the children to shape and influence their own engagement and to act as authors of their media use.

We also saw evidence of parents' active involvement in and support for these child-initiated activities, evidencing how the child's agency was co-constructed into being in a joint activity between the child and adult. Across the two families who participated in our study, it was common for there were jointly agreed rules for the child's digital media use in terms of both time and content. In both families, the children showed evidence of being able to hold to the rules they had made together with their parents concerning their use of the technology, as well as to discuss and negotiate the "rules" of use with their parents. Hence, our study points out how the child' s agency is intertwined with the child being accountable for joint rules that mediate their engagement with digital media in the home. Moreover, our study suggests that in order for the children's agentic opportunities to flourish, there must be a culture of trust between the parents and the child for holding joint rules in digital media use.

At the same time, while reporting on our results, we understand that our study is small scale and that the families and children who took part in our study only represent themselves, as all families do. Nevertheless, we believe our study holds potential to illuminate the situated co-construction of these children's agency in their media use at home, offering insights into sociocultural conditions and resources that make these children's agency possible. This entails making visible how these two young children were learning to control themselves by internalising cultural values, traditions and tools, as well as, equally, learning to use these cultural tools, i.e. digital media in creative and personally meaningful ways, as well as to overcome existing constraints and develop something new (also see Rainio, 2009). These findings provide important lessons for parents and educators working with young children. In both case study families, the children were offered 'open spaces' for enacting agency, while at the same time, the parents tried their best to ensure the child's safe and purposeful use of digital media.

Our study also demonstrates how the "Day in the Life" methodology (Gillen et al., 2007; Gillen & Cameron, 2010) can act as a prominent and culturally sensitive research tool to capture the nuanced processes in children's everyday lives that mediate their agency. This methodology resonates well with our conceptual approach, which holds that agency must be analysed and understood at the nexus of interlinked levels. These include the moment-to-moment interactions where agency is situationally constructed into being, the sociocultural contexts and its resources available to the child and finally the continuity and development of situational manifestations of agency across time and space. The use of this method, however, requires that the researchers be appropriately trained with the actual method and its ethics. It also calls for sensibility and flexibility from researchers in respecting the families and their wishes in terms of data collection.

Our study points to the importance of further research in young children's use of digital media in varied homes, with varied resources, rules, values and practices. The European level 'A Day in the Digital Lives of Children aged 0–3' run by the of the DigiLitEY programme provides a promising context to explore further young children's everyday lives in digitalising homes and communities.

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“NÃO HÁ PARENTALIDADES PERFEITAS” – CAMINHOS E DESAFIOS DO DIGITAL NO DIA A DIA DAS FAMÍLIAS MODERNAS

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Resumo

Evidências empíricas mais recentes demonstram e reforçam a (omni) presença material e funcional de novos e velhos média nos lares portugueses. A discussão deste capítulo decorre de entrevistas com famílias com contextos socioculturais e demográficos distintos, cujos pais começaram a utilizar a internet e a jogar videojogos por volta dos seus treze-catorze anos. Como estão estes novos pais a acomodar os equipamentos móveis, conectados e convergentes, cada vez mais indissociáveis da vida moderna? E como lidam com os desafios daí resultantes?
Sem pretender à generalização, as suas histórias e contextos retratam temas e perspetivas que encontram eco em outros pais que se identificam com as mesmas encruzilhadas: tempo de ecrã, conteúdos que as crianças apreciam, motivações e envolvimento das famílias nos usos dos ecrãs, estratégias de mediação parental, reflexões e inconsistências dessa mediação e a agência das crianças são alguns dos temas a que dão voz.
Contrariando expectativas, as intervenções parentais continuam fortemente influenciadas por debates clássicos e são reveladoras do que ainda há por fazer no sentido de empoderar as famílias a tirarem partido deste novo mundo de possibilidades.
O recorte de dados analisados faz parte do primeiro estudo longitudinal de natureza qualitativa envolvendo famílias com crianças menores de oito anos.

Palavras-chave: Mediação parental, tecnologias digitais, crianças 0-8, YouTube.

Introdução

Dentro da temática *crianças, famílias e tecnologias*, este capítulo dirige o olhar para desafios que põem em causa direitos da criança e para caminhos de acomodação e uso de recursos digitais em contexto doméstico, no dia a dia. Através das tecnologias, o espaço doméstico adequou-se a uma realidade tecnológica mais sofisticada, assim como a agência dos mais novos e as interações entre os membros da família mediadas pelas relações que criam com esses objetos.

Evidências empíricas mais recentes demonstram e reforçam a (omni) presença material e funcional de novos e velhos média nos lares portugueses e nas rotinas diárias de pais e filhos, sejam elas autónomas ou conjuntas, dentro ou fora de casa, influenciando padrões de apropriação e uso, interações, mediações e dinâmicas (cf. Chaudron, Di Gio & Gemo, 2018; Dias & Brito, 2016; Ponte, Simões, Batista, Castro & Jorge, 2017). Novas gerações de pais – que começaram a tirar partido do digital e da internet na adolescência – e de crianças – que nasceram numa paisagem já amplamente marcada pela inovação e pelo consumo de tecnologia digital, que acomodam desde cedo nas suas vidas – marcam o tom deste capítulo que se apoia em dados provisórios do estudo *Famílias iTec*.

Sendo este o primeiro estudo longitudinal nacional envolvendo famílias portuguesas com crianças com idades compreendidas entre os 0 e os 8 anos, as características sociodemográficas dos lares e circunstâncias da família, nomeadamente o rendimento, rotinas, horários, configuração da casa e as percepções que os pais usam para interpretar a realidade envolvente, ajudam a dar sentido às suas narrativas e às suas estratégias de intermediação parental (Gee, Takeuchi & Wartella, 2018; Hoover, Clark & Alters, 2004; Zaman, Vanattenhoven, De Ferrerre & Looy, 2016).

Como estão os novos pais, que aprenderam a falar a linguagem digital na sua adolescência, a acomodar os equipamentos móveis, conectados e convergentes, cada vez mais indissociáveis da vida moderna? E como lidam com os desafios daí resultantes?

De modo a estimular o debate sobre crianças e tecnologia no contexto familiar, este capítulo tem por sustentáculo as vozes de pais de quatro famílias de características distintas. Sem pretender à generalização, pequenos trechos das suas narrativas e contextos seguem uma estrutura encadeada que retrata temas e perspetivas comuns a outras vidas familiares que vivem em tempos de mediatização profunda (Hepp & Hasebrink, 2017) e que certamente encontram eco em outros pais que se identificam com as mesmas encruzilhadas.

Famílias iTec: objetivos e métodos

O objetivo central do estudo *Famílias iTec*, onde se inserem os conteúdos aqui apresentados, consiste em obter uma compreensão holística e empiricamente fundamentada de como famílias portuguesas com crianças menores de 8 anos estão a socializar as suas crianças para o uso das tecnologias digitais e a acompanhar esses acessos e usos no contexto doméstico. Para tal são considerados os vetores biográficos, demográficos, económicos, sociais e culturais que as diferenciam, numa perspetiva não só longitudinal mas também ecológica (Bronfenbrenner, 1979). Esta pesquisa, que assenta num modelo social-construtivista de desenho qualitativo, pressupõe triangulação de métodos, de dados e de teorias para minimizar os efeitos de unilateralidade e distorção na interpretação dos dados.

O acesso a famílias com crianças com menos de 8 anos envolveu divulgação com apelo à participação voluntária, disseminada por contactos pessoais, via e-mail. A seleção das famílias, após preenchimento de um formulário online, foi feita de modo a garantir diversidade quanto à idade e sexo das crianças, estruturas e composições dos agregados e indicadores de caracterização socioeconómico (ver tabela 1). O consentimento informado foi recolhido em formulário próprio na primeira visita e negociado a cada nova visita, tal como o assentimento da(s) criança(s) participantes. O enquadramento ético que orienta este estudo segue os parâmetros aplicados na investigação da rede *EU Kids Online*. As identificações reais das famílias foram substituídas por pseudónimos e as informações pessoais ocultadas nas transcrições.

O material empírico que integra este capítulo provém de entrevistas semiestruturadas realizadas entre dezembro de 2017 e julho de 2018. O guião de entrevista incluiu questões sobre as rotinas da(s) criança(s), os equipamentos digitais existentes em casa e acesso pela(s) criança(s), considerações dos pais sobre socialização para o uso dos velhos e novos média, hábitos mediáticos, percepções sobre acesso, posse e uso, mediação e regras, oportunidades e riscos, parentalidade e infância, informação demográfica sobre os pais (e filhos com idade superior a 8 anos) e a sua experiência relativamente às tecnologias modernas.

Por velhos e novos média referimo-nos à definição alargada inspirada em Gee, Takeuchi e Wartella (2018) que inclui os telemóveis, smartphones, tablets, portátil, computador de secretária, DVD, video streaming, jogos digitais, websites, redes sociais, livros, cinema, televisão e rádio.

De acordo com os limites cronológicos definidos pela Organização Mundial da Saúde (OMS), isto é, entre os 10 e os 19 anos.

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Crianças, famílias e Tecnologias: estilos e contextos

Para refletir sobre a utilização das tecnologias em contexto doméstico por parte de crianças mais novas, este texto parte de dados provenientes de quatro primeiras entrevistas com famílias com contextos socioculturais e demográficos distintos, mas cujos pais começaram a utilizar a internet e a jogar videojogos na sua adolescência, por volta dos 13/14 anos.

Tabela 1.
Caracterização das famílias em análise

Familia	Pai	Mãe	Filho/a 1	Filho/a 2
Alves	29 anos, trabalhador-estudante (lojista)	33 anos, professora	Afonso, 22 meses	____
Dantas	36 anos, diretor	34 anos, investigadora	Diana, 4 anos	Daniela, 4 meses
Freitas	33 anos, técnico de audiovisual	34 anos, economista freelancer	Frederico, 3 anos	____
Pires	34 anos, operário fabril	31 anos, desempregada	Pedro, 6 anos	Pilar, 14 meses

A seleção de estas quatro famílias prende-se ainda com o facto de as mães terem tido o primeiro filho entre os 25 e os 31 anos (valores da média nacional situam o primeiro filho aos 30 anos, (PORDATA, 2017) e porque traduzem novos tipos de família e relacionamentos. Os fluxos de migração que fazem de Portugal um país de emigrantes e de imigração: três pais são naturais de Cabo e Verde, Brasil e França; um pai e as quatro mães são de nacionalidade portuguesa. Espelhando sinais dos tempos, uma família é monoparental e das três nucleares, uma assenta em união de facto.
No total, seis crianças (três rapazes e três raparigas) compõem estes agregados com idades entre os quatro meses e os seis anos.
Das entrevistas com as famílias sobressaem temas, como o tempo de ecrã, conteúdos que as crianças apreciam, motivações e envolvimento das famílias nos usos dos ecrãs, estratégias de mediação parental,
reflexões e inconsistências dessa mediação, a agência das crianças. Segue-se uma pequena apresentação dos temas que mais sobressaíram de cada uma dessas conversas.

"Não quero que ele fique atrás dos miúdos da idade dele"

Os pais (mãe, 33 anos; pai, 29 anos) do Afonso (22 meses) estão separados desde os seus seis meses de idade. Ele vive com a mãe e está com o pai quase todos os dias. A mãe é professora e o pai é trabalhador-estudante. Em casa do Afonso raramente a televisão é ligada ("não ligo todos os dias, nem todas as semanas") e, por isso, a mãe não sabe nomear canais ou programas infantis.

No dia a dia, as rotinas digitais do Afonso, quando está com a mãe, giram à volta das tecnologias móveis. O tablet "normalmente, está na cadeira de refeição" do Afonso, e embora ele não tenha acesso ao dispositivo quando quer, este objeto acaba por ser indispensável, porque "é uma forma de ele comer". Sendo uma mãe que passa uma boa parte do dia fora de casa, no exercício da sua profissão, procura ter momentos para interagir com o filho. Na hora da refeição, o Afonso segue as indicações da mãe: "põe música, filho", "onde está o cão?". Habilmente, o Afonso reconhece e abre a aplicação do YouTube e, a partir daí, "ele próprio já escolhe o que quer ver". Vê os videoclips de que gosta "muitas, muitas, muitas vezes", como uns "com seis milhões de visualizações" em que crianças "fazem montes de disparates" e que o "sobrinho também descobriu". A mãe sabe o que o filho gosta de ver no canal de vídeo e ele sustenta a interação com a mãe: "é menina". A mãe tem a preocupação de não o deixar muito tempo em frente ao ecrã, mas a seguir acrescenta que o "tempo é relativo", quando por exemplo, usam o dispositivo para se filmarem ou como rádio para ouvirem música e divertirem-se a dançar.

Depois de jantar, mãe e filho brincam com puzzles ou fazem de conta que cozinham. Antes de dormir não pode faltar o livro impresso, onde aprende a identificar animais ou a repetir palavras. O tablet estimula outras aprendizagens que a mãe considera fundamentais para que ele acompanhe os tempos e não "fique atrás dos miúdos da idade dele", como saber "carregar no ecrã touch" e "ouvir e responder à voz do tablet". Além disso, o tablet ajuda a manter o Afonso em segurança, de manhã, enquanto se preparam para sair: "eu tomo banho muito mais descansada do que se ele andar pela casa… porque nós vivemos sozinhos."

"Não há parentalidades perfeitas"

A televisão é o ecrã que junta as gerações da família Dantas. Está sempre ligada nem que seja como ruído de fundo. Como brinca o pai (36 anos, diretor): "até o gato vê televisão".
Pai e mãe (34 anos, investigadora) têm "formas diferentes de lidar com a tecnologia": ele "é mais conservador", tira o som ao telemóvel da esposa e acha que "os miúdos têm muitas coisas, muito cedo"; ela é "capaz de responder a um e-mail no meio da refeição". Este contraste manifesta-se na forma como gerem as tecnologias com a Diana (4 anos). "As exceções são mais comigo", afirma a mãe. Já o pai assegura que a Diana "nem se apercebe do que é o YouTube", porque, quando esporadicamente lhe mostra um vídeo, transmite do smartphone diretamente para a televisão "sem lhe dar controlo". A mãe acha que esta estratégia do pai é "interessante", mas em tempos, ficou "maravilhada" quando deu conta de como era fácil pôr a filha a comer com a ajuda do tablet.
Contudo, a Diana rapidamente "começou com o dedito" a explorar o YouTube e saltava para conteúdos que os pais não aprovavam:
"desembrulhar ovos Kinder" e "pessoas a fazer de mascarados". Um dia atirou o tablet ao chão, foi a oportunidade que os pais agarraram para quebrar um "ciclo que é um pouco vicioso" e um problema que adiavam, "porque sabemos que se retiramos, nesse dia, ela não vai comer". O problema foi contornado pela pequena Diana, substituindo o tablet pela televisão: "e ela [agora] come a ver televisão". Face a novas paisagens digitais, os próprios pais vão experimentando e ajustando estratégias de modo a encontrarem o que melhor se ajusta à sua expectativa de família. No final, a mãe desabafa: "não há parentalidades perfeitas. Uma pessoa tenta sobreviver."
A filha mais nova do casal, a Daniela (4 meses) ainda não é alvo deste tipo de preocupações e o que retiram do que têm aprendido como pais é que "ela tadinha, não vai ter tablet" [risos].

"*Às vezes eles ficam mais irrequietos nos ecrãs e eu sou contra isso*"

A família Freitas tem preocupações ecológicas, fazem reciclagem, não são adeptos do consumismo e evitam a interferência dos ecrãs nas rotinas quotidianas. Ainda não sabem como vão incluir as tecnologias na vida do Frederico (3 anos): "por não usarmos uma coisa, não quer dizer que ele não vá usar". E, para já, não estimulam o uso, até porque "o trabalho é todo em ecrã" (mãe, 34 anos, economista freelancer; pai, 33 anos técnico de audiovisual). Não têm serviço de TV por Cabo, embora apanhem o canal Panda, se não apanhassem "azar". Não têm Wi-Fi, acedem à internet móvel a partir da conta dos pais da mãe, que é suficiente para emails de trabalho. A mãe está grávida, mas ainda se desloca de bicicleta e esta é uma atividade (entre outras ao ar livre, quando o tempo permite) que gosta de partilhar com o Frederico.

Para já, a rotina dos ecrãs na vida do Frederico fica a cargo dos avós, ao final da tarde, depois do jardim de infância. Com o avô vê vídeos no YouTube "relacionados com aviões ou comboios que é o que ele gosta", como "Bob, o trem". A mãe não consegue especificar porque: "nunca vi com muita atenção, confesso [e] eu não sei pôr". Para além disso, tem um tempo em que "fica a ver a caixa" (televisão), no canal Panda.

Em casa, o jantar é sem ecrãs, porque o Frederico está numa fase que demora muito a comer e a mãe quer que "ele coma sozinho, sem ajuda". A televisão quase só é ligada quando o Frederico pede para ver um pouco de desenhos animados que "se não é todos os dias, é quase". Embora considere que os conteúdos do canal 2 têm mais qualidade, "não é o que ele gosta" e, por isso, assiste à Patrulha Pata. Depois desse momento de final de tarde, "não há mais ecrãs", porque depois de ver televisão, o

Frederico fica "irrequieto" e "irritadiço". Os pais preferem manter as rotinas sem ecrãs, optando por ouvir música e ler.

Fora de casa, "carrinhos pequenos, um bloco e lápis de cor" é ao que recorrem quando é preciso distrair o menino. Já em viagens de carro ou de

avião, o ecrã, confessam: "ajuda muito".

"É uma maneira de nós estarmos com ele"

Apesar dos recursos económicos limitados (mãe, 31 anos, desempregada; pai, 34 anos operário numa fábrica), a família Pires considera que é importante criar condições para os filhos "descobrir[em] o mundo", seja através de passeios, idas ao cinema, exposições ou através dos jogos, filmes e documentários:

Mãe: Teve uma fase que só queria ver dinossauros. Mas à conta disso, aprende. Como é que eles foram extintos. O nome dos dinossauros. Como é que os dinossauros foram extintos?
Pai: Anda lá.
Pedro: Por um asteroide.
Mãe: Como é que se chama o dinossauro que tu gostas muito?
Pedro: Reeeeex.
Mãe: Mas há mais. Como é que se chama o das asas?
Pedro: Pterodactyl.
Mãe: E foi à custa de o levarmos, aos três anos, a uma exposição de dinossauros, no Porto.

Em casa, a maior parte das rotinas e interações acontecem à volta dos ecrãs, em particular, a Smart TV que têm na sala, onde jogam videojogos com o filho mais velho (Pedro, 6 anos): "é uma maneira de nós estarmos com ele". Enquanto isso a irmã mais nova (Pilar, 14 meses) assiste animada do parque acomodado no centro da sala: "ela adora vê-lo jogar PlayStation". Apesar de controlarem o acesso, já se deram conta da influência de Pilar ver o irmão no YouTube, porque a menina já tenta "passar o dedo" no ecrã. Durante a entrevista fica a sensação de que o Pedro tem acesso quando quer à televisão e aos smartphones dos adultos, mas os pais asseguram que há regras bem definidas no que toca a conteúdos, tempo e acesso, até porque no "YouTube há de tudo" e quando ele se porta mal, é nestas benesses que o pai "cort[a] radical".
Os pais foram gamers na sua adolescência, mas na sua perspetiva, "antigamente era diferente" podiam estar "um dia inteiro em frente à televisão e depois o resto da semana, íamos lá para fora jogar bicicleta ou jogar futebol". Por essa razão, quando o Pedro pediu uma PlayStation, a mãe durante muito tempo foi contra, porque não quer que ele fique "viciado". Porém, reconhecem que "dá imenso jeito", quando, por exemplo,

o pai trabalha de noite e precisa de dormir de dia: "o miúdo fica aqui [na sala], fecha a porta".
O Pedro sabe ligar a PlayStation, mas apenas o faz sozinho, quando autorizado. Embora exista na sala uma larga coleção de jogos adequados à idade dele, o GTA (para maiores de 18 anos), que descobriu com o padrinho, é o seu preferido. Os pais não aprovam, porque "é um jogo que não é para ele", "altera-lhe a cabeça... fica mais enervado, mais respondão e também tem pesadelos". Mas, "de longe a longe", "se ele se portar bem", deixam jogar. Sendo eles também jogadores compreendem o estímulo que move o Pedro a querer se superar e a fazer "missões" para "chegar ao fim do jogo". E, por isso, às vezes os pais têm que lhe dizer: "desliga isso" ou tirar-lhe a PlayStation quando revela "mau perder".
No que toca a controlos parentais, é a mãe que se mantém informada sobre o assunto, ajuda o Pedro nas dificuldades técnicas e gere os registos e perfis de jogador: "quem tem as passwords e acesso para mexer em tudo e mais alguma coisa e fazer alterações à PlayStation, sou eu".
O tempo de televisão da família é à volta do Disney Júnior, de filmes e séries, não porque o Pedro monopolize a televisão, mas porque no telejornal "só dá política e futebol".

Considerações

Querem ser vistos como pais modernos que acompanham os tempos e não querem que os seus filhos fiquem para trás nas oportunidades que o digital promete. Numa lógica da faca de dois gumes que marca os contextos contemporâneos (Giddens, 1990), mesmo os pais mais relutantes acabam por se render às "oportunidades, prazeres e conveniências" (Blum-Ross & Livingstone, no prelo) dos ecrãs e das aplicações que os auxiliam no exercício diário da sua parentalidade (Elias & Sulkin, 2017), em particular na hora da refeição ou fora de casa para manter os filhos entretidos ou ocupados.

Com uma paisagem digital que muda rapidamente, serem os facilitadores, mentores e guardiões (Broekman, Piotrowski, Beentjes, Valkenburg, 2018) desse acesso e uso, é uma responsabilidade que reclama dos pais abordagens e estratégias digitalmente competentes, capacitantes e flexíveis que possam ir ao encontro das expectativas e direitos dos filhos e dos pais, sem esquecer desafios ampliados pelos média digitais (Blum-Ross & Livingstone, 2016; Livingstone, Ólafsson, Helsper, Lupiáñez-Villanueva, Veltri & Folkvord, 2017). Contudo, as suas intervenções parentais continuam a ser fortemente influenciadas pelos debates clássicos das tecnologias e da infância e replicam preocupações com o tempo de ecrãs, riscos da autonomia no acesso, conteúdos desadequados, possibilidade de vício e de perturbações de comportamento.

Querem ser bons pais e querem o melhor para os seus filhos, mas as suas falas, por vezes inconsistentes e em busca de validação, são reveladoras das suas necessidades em encontrarem respostas que equacionem também os direitos das crianças e que respeitem os seus valores, empoderando-as a tirarem partido deste novo mundo de possibilidades.

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E-FAMÍLIAS: O IMPACTO DAS TIC NA VIDA CONTEMPORÂNEA DE FAMÍLIAS COM CRIANÇAS

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Resumo

Hoje, as crianças nascem rodeadas de tecnologia e utilizam-na, diariamente, acedendo ao mundo com a ponta dos dedos. Mas se por um lado as Tecnologias de Informação e Comunicação (TIC) são uma janela de oportunidades, por outro expõem crianças e famílias a uma multiplicidade de riscos. Para avaliar o impacto das TIC no contexto familiar, 179 indivíduos (23-47 anos) pertencentes a famílias com filhos até aos oito anos, responderam a um questionário sobre a utilização das TIC (QUTIC) e sobre o funcionamento familiar (SCORE-15). Os resultados revelaram que as TIC são sobretudo utilizadas para contactar com familiares distantes (91%), porém, discussões sobre o tempo despendido com as TIC (67%) e falta de limites entre a vida familiar e profissional/escolar (47%) foram os maiores problemas evidenciados. Estes problemas acarretam dificuldades na interação dos membros das famílias, sobretudo ao nível da dimensão dos recursos familiares, isto é, das capacidades da família para gerir problemas quotidianos e adaptar-se a mudanças (r = .360, p < .01). O presente estudo permitiu conhecer o tipo de utilização das TIC realizado pelos participantes, as suas perceções sobre o impacto das TIC nas dinâmicas familiares, bem como compreender melhor a complexidade destas relações.

Palavras chave: Tecnologias de informação e comunicação; Funcionamento familiar; Família com filhos até 8 anos.

Introdução

Ao longo das últimas duas décadas, as tecnologias de informação e comunicação (TIC), que incluem plataformas de hardware e software adaptáveis e interoperáveis (Bacigalupe & Lambe, 2011), difundiram-se pela sociedade e encontraram um lugar significativo na esfera da vida familiar (Livingstone, Mascheroni, Ólafsson, & Haddon, 2014). As crianças na contemporaneidade nascem rodeadas de tecnologia e utilizam-na ativamente através de uma variedade de dispositivos, recriando formas de comunicação e lazer, enquanto acedem ao mundo com a ponta dos dedos (Dias & Brito, 2016; Lepičnik-Vodopivec & Samec, 2013).

A influência das TIC no funcionamento das famílias

Decorrente dos rápidos avanços tecnológicos e da inclusão das TIC no contexto familiar, tem-se assistido a mudanças sem precedentes no funcionamento familiar (Carvalho, Francisco, & Relvas, 2015; Hertlein, 2014). Hoje em dia é improvável não se utilizar o telemóvel para avisar um filho de que chegaremos mais tarde ao seu encontro ou abdicarmos de estabelecer contacto com familiares através de videoconferência. Mas, concretamente, que alterações têm as TIC provocado no funcionamento das famílias?

Alguns estudos ressaltam a diminuição do tempo passado em família (Nie, 2001), a probabilidade de maior distanciamento afetivo entre os membros da mesma família (Bran Piedrahita et al., 2016) e a possibilidade de ocorrência de conflitos intergeracionais (Mesch, 2006a,b). Estes conflitos surgem frequentemente face à elevada frequência de utilização da internet para fins de entretenimento pelos filhos (Mesch, 2006a) e ao fenómeno da *cultura de quarto*, onde os filhos se isolam em atividades *online* com amigos (Mesch, 2006a,b), dificultando o exercício da parentalidade, por vezes, sem modelo referencial face às TIC (Plowman, McPake, & Stephen, 2010). Adicionalmente, as TIC são consideradas como facilitadoras da perda de controlo sobre as interações, permeando situações de adição às TIC (Young & Nabuco de Abreu, 2011) e de diluição de limites entre as esferas pública e privada (Mesch, 2006b), não só pela comodidade de hoje se poder trabalhar a partir de casa (Wajcman, Rose, Brown, & Bittman, 2010) mas também pela facilidade com que se
publicam dados privados (Livingstone et al., 2014). No seu reverso, dada a facilitação da gestão diária de atividades em tempo real através de múltiplos dispositivos móveis (Devitt & Roker, 2009; Stern & Messer, 2009), as TIC permitem também um aumento do tempo em família, por vezes através da partilha de atividades online (Plowman et al., 2010). Vários estudos têm mesmo demonstrado que as TIC passaram a representar um veículo facilitador na manutenção de relações à distância, onde a família pode tornar-se virtualmente presente e assegurar a identidade familiar (Bacigalupe & Lambe, 2011; Stern & Messer, 2009).

Em suma, introduzidas no contexto familiar, as TIC têm implicado mudanças não só nos estilos de comunicação, na adoção de novas linguagens e na qualidade relacional entre os membros da família, como também têm contribuído para a redefinição de regras, limites e papéis familiares (Carvalho et al., 2015; Hertlein, 2014), podendo mesmo ser consideradas um novo subsistema familiar (Johnson & Puplampu, 2008). No entanto, os resultados são inconsistentes relativamente à influência que estas provocam no contexto familiar, funcionando como duas faces da moeda, pois, se por um lado são uma janela de oportunidades, por outro expõem crianças e famílias a uma multiplicidade de riscos (Livingstone et al., 2014).

Famílias Portuguesas com filhos até aos oito anos e a utilização de TIC

Desde o nascimento do primeiro filho à sua entrada na escola, a família passa por um conjunto de reorganizações, sobretudo, através da definição de papéis parentais/filiais e do reajustamento de limites do novo sistema familiar face ao exterior (Relvas, 1996). Ora se às novas tarefas que se colocam a estas famílias forem adicionadas as TIC, a equação parece ganhar resultados surpreendentes, pois as famílias com crianças são consideradas mais tecnológicas, encontrando-se mais conectadas do que famílias que não têm filhos (Dias & Brito, 2016; INE, 2017). Pesquisas realizadas recentemente em Portugal revelam que nas residências de crianças dos três aos oito anos há pelo menos um televisor (99%), um telemóvel (92%), um computador portátil (70%) e um tablet (68%), dispostos nos espaços comuns da casa e ao alcance das crianças, fazendo parte das suas rotinas diárias (Ponte, Simões, Batista, Jorge, & Castro, 2017). Estudos revelam que, independentemente do nível socioeconómico (NSE), as famílias têm acesso aos mesmos meios digitais (Dias & Brito, 2016), verificando-se um aumento da qualidade e quantidade destes nas famílias com um NSE mais elevado (Brito, 2017). Outros estudos reportam que crianças de NSE mais elevado utilizam mais internet, enquanto as de condição escolar mais baixa possuem mais aparelhos digitais (Ponte et al., 2017). Entre os pais, 80% são internautas, fazendo o acesso à rede através de casa (96%), ao passo que 38% das crianças até aos oito anos acede à internet, sendo o tablet o dispositivo mais utilizado (63%). Este parece figurar mais como "*babysitter*" (enquanto os adultos estão ocupados com outras tarefas) do que como promotor de atividades de aprendizagem ou de interação familiar (Dias & Brito, 2016; Ponte et al., 2017). Este cenário pode ser permeável à ocorrência de situações
problemáticas, como o acesso a conteúdos inadequados para a idade (Livingstone et al., 2014). Estudos recentes revelam que os pais supervisionam mais o comportamento dos filhos em relação ao tempo e aos conteúdos acedidos na televisão, mas relativamente a outras TIC, consideram ser cedo para se preocuparem com perigos *online* (Dias & Brito, 2016) ou revelam uma fragilidade nas suas competências digitais de observação e controlo, receando a possibilidade de estranhos contactarem com os filhos (Ponte et al., 2018). As crianças parecem saber mais sobre meios digitais do que os pais pensam e tendem a explorar os dispositivos sozinhas, sem qualquer treino específico (Plowman et al., 2010). E se por um lado parece assustador, por outro, estes filhos estão a ter a possibilidade de redescobrirem novas capacidades, uma vez que as TIC se revestem de um enorme potencial no desenvolvimento das crianças (Lepičnik-Vodopivec & Samec, 2013; Ponte et al., 2018), promovendo novas formas de aprendizagem, criatividade e comunicação (Brito, 2016).

A investigação relativa à temática da utilização de tecnologias em

contexto familiar tem vindo a aumentar nas últimas décadas, sobretudo com crianças a partir dos nove anos de idade (e.g., EU Kids online) mas os estudos com crianças mais novas e o seu impacto no funcionamento familiar global são ainda reduzidos (Carvalho et al., 2015). Assim, este estudo pretendeu dar resposta às seguintes questões: a) Quais os padrões de utilização das TIC pelos pais de crianças até aos oito anos? b) Como é que os pais de destas crianças percecionam o impacto da utilização das TIC no contexto familiar? e c) Qual a relação entre a perceção do impacto das TIC na família e o funcionamento familiar?

Metodologia

O presente estudo faz parte de uma investigação mais alargada, que pretende avaliar a interação entre a utilização das TIC e a dinâmica familiar, em diferentes etapas do ciclo de vida familiar (Carvalho, Fonseca, Francisco, Bacigalupe, & Relvas, 2016). Os dados foram recolhidos através da plataforma *LimeSurvey* mediante a partilha do *link* de acesso, entre outubro de 2016 e março de 2018, com recurso ao método de bola de neve.

Com o objetivo de avaliar o impacto das TIC no funcionamento de famílias com filhos até aos oito anos, fez-se um recorte da amostra total (N = 1326). Assim, a amostra do presente estudo é constituída por 179 indivíduos entre os 23 e os 47 anos de idade (*M* = 35.5; *DP* = 4.8), maioritariamente mães (70%), de nível socioeconómico médio (59%) e residentes nas regiões Centro (42.5%) e Área Metropolitana de Lisboa (34.1%). As famílias dos participantes são maioritariamente famílias nucleares intactas (86.7%) e constituídas por um filho (50%) ou dois (46%). Para além de um questionário de dados sociodemográficos, os participantes responderam a um questionário sobre a utilização das tecnologias de informação e comunicação (QUTIC) e outro sobre o funcionamento familiar (Systemic Clinical Outcome Routine Evaluation; SCORE-15). O QUTIC (Carvalho, Francisco, Bacigalupe, & Relvas, 2018), baseado num instrumento que avalia a forma como os terapeutas familiares percebem o impacto das TIC nas famílias que acompanham (SEFT; Bacigalupe, Camara & Buffardi, 2014), pretende caracterizar o padrão de utilização das TIC pelo respondente (tipo de TIC utilizadas, frequência, finalidade e contexto do seu uso), bem como avaliar a perceção individual do impacto das TIC no contexto familiar e das situações problemáticas vivenciadas no contexto familiar decorrentes do seu uso. O SCORE-15 (Stratton, Bland, Janes, & Lask, 2010; versão portuguesa de Vilaça, Sousa, Statton, & Relvas, 2014) avalia diversos aspetos do funcionamento familiar (forma como as interações familiares são vivenciadas) sensíveis à mudança terapêutica, através das dimensões da Comunicação (padrão comunicacional estabelecido), Dificuldades (fragilidades que a família possui) e Recursos Familiares (capacidades para se adaptar a novas circunstâncias e gerir dificuldades quotidianas).

Resultados e Discussão

Padrão de utilização das TIC pelos pais de crianças até aos oito anos

Segundo os dados da pesquisa, as atuais famílias Portuguesas com filhos até aos oito anos de idade que integram a amostra são claramente famílias digitais, vivendo rodeadas de tecnologia. Conforme ilustra a Figura 1, cerca de 90% dos pais e mães de crianças até aos oito anos utiliza diariamente uma grande diversidade de TIC (internet, email, redes sociais, computador portátil e smartphone), sendo a internet utilizada praticamente pela totalidade dos participantes. Apesar de o tablet ser identificado por alguns autores como o dispositivo mais utilizado por crianças até aos oito anos (Dias & Brito, 2016), não consta na lista das cinco TIC mais utilizadas pelos pais do nosso estudo, remetendo para a possibilidade deste ser efetivamente utilizado como "babysitter" e estar a ser escamoteado o seu potencial de interação familiar (Dias & Brito, 2016).

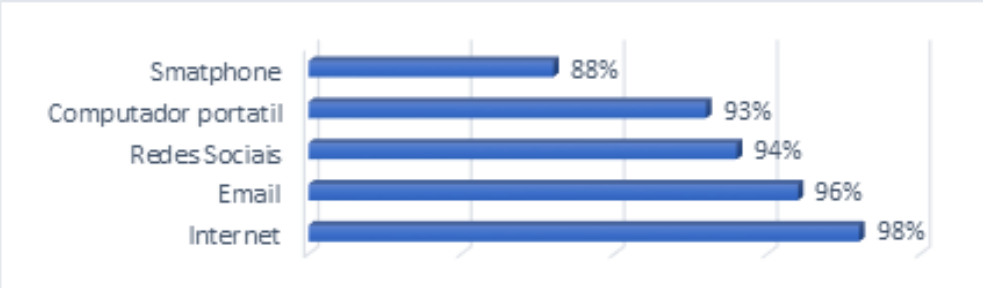

Figura 1. Percentagem das principais TIC utilizadas pelos pais.

A caracterização da utilização média das TIC mais utilizadas por estas famílias encontra-se na Tabela 1, considerando o tempo de utilização, o contexto e a finalidade.

Tabela 1
Utilização média de TIC em função da frequência, contexto e finalidade

TIC	Frequência diária	Contexto	Finalidade
Internet	1-3h	sala	informação
Email	1-3h	sala	profissional
Redes sociais	30-60min	sala	entretenimento
Computador portátil	3-6h	sala	profissional
Smartphone	1-3h	mobilidade	comunicação e entretenimento

Nota. h = horas; min = minutos.

Excetuando o smartphone, que é sobretudo utilizado em contexto de mobilidade, a sala surge como o denominador comum da utilização das principais TIC. O computador portátil e o email são ambos acedidos na sala com fins profissionais e/ou académicos. A possibilidade de se trabalhar a partir de casa talvez possa explicar, em parte, a elevada frequência (47%) de problemas de ausência de limites entre a vida familiar e profissional que as famílias desta amostra assinalam (Stevenson, 2011; Wajcman et al., 2010).

Impacto das TIC no contexto familiar

Conforme mostra a Figura 2, as TIC são percecionadas por estas famílias como responsáveis pela *redução do tempo passado em família* (67.1%). A literatura científica aponta a diminuição deste tempo (Nie, 2001) quando as atividades *online* não são partilhadas entre os membros da família e o tempo despendido com estas não se reverte noutra atividade. Assim, e dado que a maioria das TIC é utilizada na sala, podemos estar perante famílias reunidas presencialmente, virtualmente ligadas com elementos, geograficamente distantes mas desconectados uns dos outros na mesma casa. Simultaneamente, as TIC são percecionadas como um veículo *facilitador das mudanças ao longo do tempo* (71.7%) e *das relações entre gerações* (58.9%). Parece reforçar-se a ideia de que o computador se tornou o novo álbum de família quando crianças crescem ao lado de fotografias suas partilhadas em redes sociais (Ponte et al., 2017). Ressalta-se ainda que as TIC parecem contribuir para o fortalecimento dos laços familiares, especialmente, nas relações à distância (Bacigalupe & Lambe, 2011; Stern & Messer, 2009).

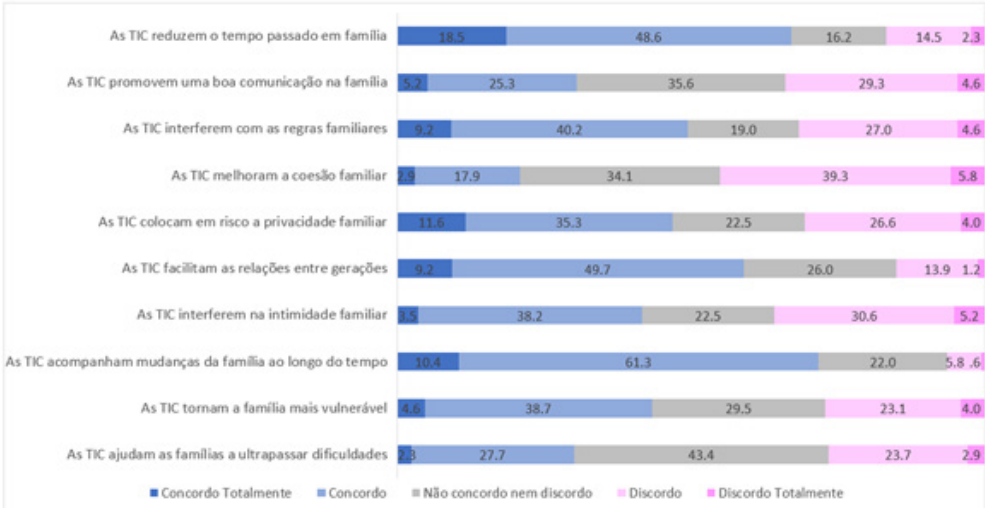

Figura 2. Perceção do impacto das TIC no contexto familiar.

De acordo com a tabela 3, reproduzida abaixo, o *contacto e troca de informações com pessoas estranhas por parte dos menores* é o problema mais reportado e que parece ser revelador do nível de consciência e do receio que esses pais têm dos riscos a que as TIC os expõem (Livingstone et al., 2014; Ponte et al., 2018). As *discussões sobre o tempo de utilização das TIC* e a possibilidade de ocorrência de situações de *dependência da internet, dos videojogos ou do telemóvel*, são dois perigos interligados e que podem ser apontados em duas direções. Não só o tempo excessivo e o risco de adição às TIC (Young & Nabuco de Abreu, 2011) por parte dos filhos podem desencadear respostas emocionais disruptivas nestes (Ponte et al., 2017) e, consequentemente, despoletar conflitos intergeracionais (Mesch, 2006a), como os pais que apresentam estas condutas podem condicionar a qualidade relacional com os filhos e revelar-lhes um modelo parental desadequado ao seu desenvolvimento (Bran Piedrahita et al., 2016). Em contraponto, a grande maioria destas famílias aponta que as TIC são essencialmente utilizadas para o *contacto com familiares distantes* (91%), permitindo-lhes assegurar a identidade familiar através da presença virtual (Bacigalupe & Lambe, 2011), e para a *gestão das atividades quotidianas* (83%) (Devitt & Roker, 2009; Stern & Messer, 2009), o que evidencia o impacto positivo que as TIC têm nestes contextos familiares.

Tabela 3

Principais problemas assinalados com o uso das TIC

Problemas	%
Contacto e troca de informações com pessoas estranhas por parte dos menores	75
Discussões sobre o tempo de utilização das TIC	67
Falta de limites entre a vida familiar e profissional/académica-escolar	47
Dependência da internet, dos videojogos ou do telemóvel	37
Acesso a conteúdos desadequados à idade (ex., violentos, pornografia) pelos menores	24
Crianças isoladas nos seus quartos a utilizar as TIC	16
Existência de problemas de saúde física por utilização das TIC (ex., lesões)	14
Infidelidade online	6

Relação entre perceção do impacto das TIC na família, problemas associados ao seu uso e funcionamento familiar

A Tabela 4 apresenta os resultados da análise de correlações entre a variável sociodemográfica (NSE), o número de TIC utilizadas, o número de problemas identificados e os resultados da escala de funcionamento familiar (resultado global e dimensões: recursos, comunicação e dificuldades).

Tabela 4
Correlações entre as principais variáveis

	Variáveis	1	2	3	4	5	6	7
1.	NSE	-						
2.	TIC	.200**	-					
3.	Problemas	.015	.072	-				
4.	Recursos	.036	-.041	.360**	-			
5.	Comunicação	-.222**	-.124	.248**	.427**	-		
6.	Dificuldades	-.249**	-.191*	.220**	.460**	.795**	-	
7.	F. Familiar	-.184*	-.142	.318**	.716**	.897**	.903**	-

*Nota. NSE = Nível socioeconómico; TIC = Número de TIC utilizadas; Problemas = Número de problemas; Recursos = dimensão recursos; Comunicação = dimensão comunicação; Dificuldades = dimensão dificuldades; F. Familiar = funcionamento familiar global. *p<.05, ** p<.01*

O elevado número de tecnologias que cada família possui e utiliza parece estar diretamente relacionado com o NSE, o que corrobora em parte a literatura (Brito, 2017). O NSE parece ainda estar associado a melhores níveis de comunicação e a menores dificuldades no funcionamento das famílias, talvez face ao maior número de dispositivos disponíveis e aos benefícios que as famílias retiram da sua utilização (Devitt & Roker, 2009; Stern & Messer, 2009).

Ao maior número de problemas relacionados com o uso das TIC associa-se um pior funcionamento familiar. Em particular, os problemas relacionam-se com níveis mais disfuncionais de comunicação, com perceção de maior sobrecarga de dificuldades e menos recursos para fazer face às mesmas. Dado que a situação problemática mais assinalada é a possibilidade de estranhos contactarem com os filhos e que, adicionalmente, alguns destes pais carecem de um modelo de parentalidade face às TIC (Plowman et al., 2010), é percetível como esta realidade pode causar flutuações consideráveis no funcionamento destas famílias (e.g., conflitos intergeracionais) (Mesch, 2006b).

Conclusão

Mais do que um cenário tendencialmente pessimista que a literatura científica tende a ilustrar sobre a influência das TIC no funcionamento das famílias (Bacigalupe et al., 2014), os resultados do presente estudo parecem apontar para um jogo dinâmico e integrador de forças positivas e negativas nesta interação, às quais as famílias se vão adaptando e funcionando de forma eficaz.

A rapidez com que a tecnologia avança, a par da precocidade com que as crianças começam a manusear dispositivos digitais, impõe que os pais tenham consciência desta realidade e que se atualizem para poderem acompanhar os filhos nesta utilização, de forma a que estes obtenham um nível de familiaridade para as utilizar de forma responsável, independente (Plowman et al., 2010) e com um propósito na sua vida (Dias & Brito, 2016; Lepičnik-Vodopivec & Samec, 2013). Neste sentido, é importante que os pais utilizem conjuntamente com os filhos dispositivos como o tablet, fomentando o seu potencial de aprendizagem e interação, mantendo um canal de comunicação com os filhos, privilegiando o conhecimento das atividades que estes encetam *online* e os encorajem a falarem sobre problemas que encontrem. Assim, é fundamental que optem pela negociação de regras e limites familiares face à utilização das TIC, em alternativa a medidas puramente restritivas (Livingstone et al., 2014; Ponte et al., 2018).

Por último, sendo esta etapa do ciclo vital caracterizada pela abertura ao exterior, a comunicação escola-família pode também ter aqui um papel relevante na promoção de uma utilização efetiva, segura e responsável das TIC pelas crianças (Dias & Brito, 2016), sustentada a montante por uma agenda de informação e formação parental em competências digitais (Livingstone et al., 2014; Ponte, 2018), que deveria ser uma prioridade na definição de políticas nacionais.

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A IMPORTÂNCIA DA AUTORREGULAÇÃO DO COMPORTAMENTO ONLINE NAS CRIANÇAS DA GERAÇÃO CORDÃO

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Resumo

A gestão do comportamento online é hoje em dia um desafio para qualquer família, por implicar a gestão do comportamento do adulto, enquanto modelo, e das crianças e jovens, com adequação de acordo com o género e a idade. As famílias já estão habituadas a gerir outro tipo de comportamentos, onde conquistam uma aprendizagem da autorregulação, que implica o estabelecimento de regras e limites coerentes e exequíveis. São exemplo disso, as regras relativas à alimentação, à segurança rodoviária, e à higiene do sono. Nestas temáticas já muita investigação foi feita em diferentes áreas do saber, ainda que seja tema de debate para muitas famílias, sobretudo as de primeira viagem com um filho, encontram muitas propostas, com dados de eficácia, de como se deve fazer. Na área da gestão saudável do comportamento online, não só as famílias ainda não têm adultos que tiveram essa experiência desde a primeira infância, como muitas vezes os próprios adultos têm dificuldade na autorregulação desse comportamento. Apresentam-se dados de intervenção com famílias e discute-se a necessidade de existir uma intervenção na comunidade alargada, com foco na promoção da gestão de um comportamento online saudável desde a primeira infância, que deve estar para além dos ecrãs.

Palavras Chave: Comportamento Online; Dependências; Autorregulação; Famílias.

INTRODUÇÃO

Este pode ser um exemplo de um diálogo numa família da presente década, com filhos de diferentes faixas etárias (crianças pequenas e adolescentes):

Filha: Mãe, o que é que eu vou fazer?
Mae: Podes ir brincar com teus brinquedos...
Filha: Oh não! Eu quero jogar no Tablet...
Mãe: Hoje não! Já estiveste ontem muito tempo...
Filha: Mas o mano está sempre no Computador...não é justo!

A relação com as tecnologias de informação e comunicação (TIC) é um grande desafio para as famílias, pelas regras e limites que têm de gerir, e sem muita experiência, ficam entregues, muitas vezes, à indefinição e ao conflito. É grande o desafio de gestão dos comportamentos online em família. Num estudo recente com pais portugueses conclui-se que em média os pais de crianças e jovens começaram a usar a Internet aos 24 anos (Patrão & Fernandes, 2018). Este dado alerta desde logo para a necessidade de se pensar no fosso geracional quanto à experiência de acesso e uso da Internet pelos mais velhos, que é completamente diferente do acesso e uso da internet pelas crianças e jovens.

Neste capítulo apresentam-se perfis de risco, que se relacionam com uma maior dificuldade de gerir o uso da tecnologia diariamente, e consequentemente a intervenção que se pode realizar, quer seja do âmbito preventivo, quer seja do âmbito clínico, na ajuda direta às famílias e comunidade alargada.

A Geração Cordão

A geração cordão (Patrão, 2017) é aquela que não consegue desligar das tecnologias, e desenvolver uma socialização mista (virtual e face a face). Nela incluem-se indivíduos de diferentes gerações – crianças, jovens e jovens adultos. Incluem-se os indivíduos das gerações denominadas sociologicamente de X e Y, que embora sejam já adultos ou jovens adultos, assumem a tecnologia como atividade principal na sua vida diária. E incluem-se os indivíduos das novas gerações Z e Alpha, que são bebés, crianças e jovens de hoje em dia, considerados por alguns autores como nativos digitais, e que face à sua relação com as TIC encontram vários desafios para que possam realizar um desenvolvimento saudável a todos os níveis.

Ao estarem ligados a dois cordões em permanência – a internet e a família – sem laçarem esses dois cordões, ou seja, sem apresentarem outros interesses, sem cumprir as tarefas da adolescência (socialização com os pares e autonomia), poderão desenvolver um comportamento que pode ir desde o uso excessivo das TIC até a uma dependência online.

Regulação do comportamento online

A regulação e a autorregulação do comportamento online está na base dos vários desafios da geração cordão, que passam pela: a) dependência emocional das TIC, que funcionam como estratégia, muitas vezes a única, para regular o estado emocional de bebés, crianças e jovens; b) dificuldade na comunicação com o outro, sobre o que pensam e sentem, pela dedicação aos ecrãs; c) dificuldade no desenvolvimento de competências socias, uma vez que se dá primazia à socialização digital em detrimento da presencial, privilegiando-se assim a resposta em diferido; d) dificuldade na autonomia, que passa a ser mais tardia, e por isso assiste-se aos pais a fazerem as atividades dos filhos, como seja, por exemplo, a inscrição num curso na universidade; e) e a dependência económica dos pais, pela indefinição de um projeto académico e/ou profissional, que se arrasta no tempo.

Este cenário espelha o risco para o saudável desenvolvimento a que se expõe crianças e jovens, estando por base a dificuldade de regular emoções e comportamentos. Perdem-se os anos áureos para realizar essa tarefa e passar da regulação estritamente externa, para a autorregulação. Os jovens não têm de cortar com a família, nem com o que vivem online. Antes precisam de conquistar competências que permitam a sua regulação emocional e social, para que consigam delinear o seu projeto de vida, que pode e deve incluir a tecnologia, para estarem integrados na sociedade. Uma percentagem de jovens vai necessitar de ajuda, por ter os critérios das dependências online, e para esses é necessário disponibilizar uma ajuda especifica, que deve ser mista – individual e familiar (Patrão et al., 2016).

Perfis de risco em crianças e jovens

Os dados em amostras portuguesas de jovens entre os 12 e os 30 anos identificam uma oscilação entre os 20% e os 25% com adição à internet, sobretudo dos jogos online e das redes sociais. Estes dados indicam que a maioria dos jovens não apresenta uma dependência online, e em comparação com amostras, sobretudo da Ásia, a percentagem de dependência online é inferior (Patrão et al., 2016) e, não obstante isso, é necessário olhar para os jovens em risco e com consumo excessivo das TIC, de forma a por um lado desenvolver uma linha de intervenção preventiva e outra curativa.

As dependências online em jovens estão relacionadas positivamente de forma significativa com a sintomatologia depressiva e ansiosa, o isolamento social, a impulsividade, a baixa autoestima, as alterações do sono, a deficiente rede de suporte social/emocional, o baixo autocontrolo, o

uso de álcool e substâncias e o baixo desempenho académico (Patrão, Machado, Aires, & Leal, 2015; Patrão, 2016; Patrão, Machado, & Leal, 2016; Patrão, 2018).

A geração cordão tem, assim, um duplo desafio. Por um lado, autonomizar-se do ponto de vista emocional, social e económico da família de origem e desenvolver um projeto de vida suficiente. Por outro lado, gerir a ligação a outro cordão – a internet. O desafio é o mesmo: gerir uma ligação de forma saudável; gerir os espaços e os tempos que estão ligados; gerir as partilhas do que é publico, e também do que é privado; gerir com quem se fala, o quê, quando e onde (Patrão, 2017).

Num estudo com 3000 jovens (Média de idades= 17.6; *DP*= 5.34) em que a maioria é do género masculino (59.9%), pertencem ao ensino básico (2º e 3º ciclos) (71.7%), vivem num meio predominantemente urbano (68.7%), nunca ficaram retidos em nenhum ano de escolaridade (67.4%), não têm uma relação de compromisso (65%) e não praticam atividade física fora das atividades escolares (51%), foi possível traçar perfis de risco, de acordo com o género, que se apresenta de seguida (Quadro 1) (Patrão, 2016).

Quadro 1.

Perfis de Risco para o desenvolvimento de dependência online de acordo com o género

Perfis de Risco	Perfil – Rapazes	Perfil Raparigas
Inicio de acesso à Internet *		
Acesso a Dispositivos Móveis*	5-8 anos	
Facilitado	5-8 anos	
Facilitado		
Média horas online por dia**	6 horas	6 horas
Preferências Online	Jogos Online	Redes Sociais
Consideram-se dependentes da Internet	Sim	Sim
Níveis Superior UPI	Sim	Sim
Utilizam a Internet para lidar com problemas emocionais	Sim	Sim
Alterações de Humor, no Sono, no Bem-estar Psicológico e no Funcionamento Familiar	Sim	Sim

*sem controlo parental; ** contabilizados o número de horas na escola, em espaços públicos e em casa

Não há diferenças significativas entre os géneros. As preferências online são a única característica que distingue rapazes (jogo online) e raparigas (redes sociais).
Um dos aspetos preocupantes é o acesso facilitado aos dispositivos móveis e a idade (entre os 5 e os 8 anos) que começam a usar as TIC, mas sem supervisão parental.
Alguns estudos alertam para o facto dos estilos parentais mais permissivos e a falta de coesão familiar se encontrarem relacionados com a presença de uma dependência online em jovens (Gunuc & Dogan, 2013; Gündüz & Sahin, 2011; Kalaitzaki & Birtchnell, 2014; Li, Dang, Zhang, Zhang, & Guo, 2014). Dados recentes, ainda não publicados, numa amostra de jovens portugueses (12 a 18 anos), indicam que os jovens que apresentam uma dependência online têm dificuldades na autorregulação dos seus comportamentos e têm uma perceção do estilo parental como permissivo e/ou autoritário.
Tisseron (2013) alerta para uma regra de utilização das tecnologias de acordo com a idade. Advoga que a televisão só deve ser introduzida aos 3 anos; os jogos offline (e.g. PlayStation) aos 6 anos; a Internet a partir dos 9 anos; e as redes sociais aos 12 anos, com vigilância parental. Estas indicações estão longe de ser seguidas, visto que cada vez é mais comum assistir-se a crianças em idade de frequência do pré-escolar a navegar na internet sem supervisão parental adequada, do ponto de vista do conteúdo e do tempo de permanência em relação com as TIC.
Neste sentido, há muito para desenvolver com os pais, especialmente ao nível da promoção da gestão saudável do comportamento online de todos, o que implica englobar cada comunidade, conjugando os contextos: familiar, escolar e social de cada criança e jovem. Não haverá mudança de comportamentos, só pela passagem de informação do do uso correto das TIC. Em diferentes áreas da saúde, já se percebeu que a mudança do comportamento está para além da passagem da informação - por exemplo a adesão a uma dieta alimentar, só acontece quando o individuo se encontra, de acordo com o modelo transteórico da mudança de comportamento, numa fase de contemplação da mudança (Ribeiro, 2005).

Família: O Modelo presencial e virtual

Da experiência clínica com famílias, numa análise qualitativa, percebe-se que as famílias estão preocupadas com o uso excessivo das TIC por parte dos filhos. Falam do uso excessivo das aplicações, jogos, redes sociais, visitas a sites, da permanência do contacto, da dependência de ser e existir só dessa forma, só com o virtual.
Mas é um facto que todas as ferramentas tecnológicas muitas vezes podem ser usadas como "chucha", como "baby-sitter" e, nesse sentido, ocupam um espaço muito importante em toda a gestão familiar diária, que

pode prevenir birras e o aborrecimento das crianças e jovens.
A família é a primeira estrutura relacional que se conhece, funciona como modelo de aprendizagens e como base reguladora dos comportamentos. As famílias já têm muita experiência na gestão dos comportamentos relacionados, por exemplo com a alimentação, o sono, a segurança rodoviária. Já sabem o que fazer e como adaptar determinadas regras, nestas áreas do comportamento, ao seu *modus vivendi* familiar.
A mudança tecnológica veio trazer vantagens e desvantagens para as famílias, no que se refere à gestão do comportamento online de todos. As vantagens são claras e bem aceites (e.g. colocar em contacto familiares e amigos distantes), mas as desvantagens são mais difíceis de contornar (e.g. para a relação de casal; privação de atividades consideradas tradicionais; aumento da individualidade, na família, mas sobretudo no mercado de trabalho) (Patrão, 2017).
Sendo a família um modelo, passa a ser de forma presencial, que já o era, mas também de forma virtual. Se temos um pai ou uma mãe dependente das TIC, então teremos filhos com maior propensão para fazer um uso excessivo das TIC.
Num estudo com 95 pais portugueses (Média de idade de 43 anos; *DP*=5.9), conclui-se que em média os pais começaram a contactar com a internet aos 24 anos, e aqueles que têm um perfil de dependência online não percecionam qualquer alteração no seu funcionamento familiar (Patrão & Fernandes, 2018).
Estes dados indicam que: a) os pais não têm experiência de contacto com as TIC na infância e adolescência, pelo que não experimentaram a autorregulação desse comportamento; os pais que estão mais horas online e que estar online é a sua principal atividade terão mais dificuldade em ter tempo para a interação familiar, mas ainda assim sentem o ambiente familiar como coeso, agradável e sem conflito. Colocam-se as seguintes questões: será que uma fotografia destas famílias passará por ver todos os elementos da família com uma tecnologia na mão e entregues a si próprios, com a maior parte do tempo em comunicação virtual? Será que a internet está a ser uma estratégia para prevenir o diálogo, a comunicação e os conflitos na família?
Naquelas famílias em que a resposta a estas questões é "sim", com comportamentos repetidos ao longo do tempo, com alterações na funcionalidade a vários níveis, pode-se entender que são famílias com elementos em risco de ter um uso excessivo das TIC.
Neste sentido, como já tem sido reforçado ao longo deste capítulo, será importante existir por um lado, um atendimento clínico para aquela percentagem de sujeitos e famílias que estão em risco ou que apresentam já uma dependência online, e por outro lado, a aposta na prevenção das dependências online, com a implementação de projectos adaptados às necessidades de cada comunidade.

Intervenção com Famílias: Gestão do comportamento online

As dependências online são um problema das famílias e não só do indivíduo, por isso a intervenção passa por todos (Patrão et al., 2016; Wölfling, Beutel, Dreier, & Müller, 2014). Existe pouca investigação sobre a eficácia das intervenções psicoterapêuticas nesta área, mas a intervenção familiar tem sido apontada como necessária e eficaz (Lam, 2015; Patrão & Marinho, 2018).

Na intervenção familiar que se tem realizado em parceria com outros colegas (Patrão & Marinho, 2018) é importante realçar que:

As características comuns nas famílias aderentes que pedem ajuda psicoterapêutica, a maioria faz um pedido centrado num jovem adolescente do sexo masculino, a viver em regime de monoparentalidade, com dependência do jogo online, com comorbilidades psiquiátricas (e.g. perturbação do comportamento, depressão). As queixas associadas são: a falta de rede social, o isolamento, as alterações de comportamento, o absentismo escolar e a ausência de projeto de vida.

A centralização no sintoma, a necessidade de ajuda expressa pela família, mas que não é em simultâneo expressa pelo jovem na mesma medida e intensidade, e a procura de soluções mágicas são comuns a todas as famílias. Para além disso, expressam expectativas irrealistas face à solução do problema, centradas na mudança de comportamento só do jovem.

Da análise da estrutura e funcionamento familiar indica que se está perante famílias emaranhadas, com fronteiras difusas entre os subsistemas familiares, com baixa diferenciação e triangulações dos seus membros, podendo estar presente nestas famílias o fenómeno da co-dependência. A baixa coesão familiar é outro fator comum associado à inconsistência nas regras dos comportamentos online (e de outro tipo de comportamentos), negação parental e do jovem sobre a existência de um problema na família, com uma visão redutora do problema, só centrado no jovem ou, na perceção do jovem, centrado nas figuras parentais. A comunicação patológica é outro aspeto comum, assente na desqualificação mútua, e no *double bind*.

Na intervenção há uma proposta de realizar uma gestão do consumo da tecnologia, pela redução do número de horas, a supervisão e partilha de conteúdos – é chamado o processo de co-construção com a família na procura de soluções e de confiança na mudança.

A pergunta-chave de como estaria a família sem o problema em causa (i.e. dependência online no jovem) faz com que cada elemento se projete nesse cenário, colocando de forma clara o fenómeno da co-dependência, e permitindo uma autoanálise reveladora de soluções, e de certa forma das capacidades de cada família começar a reagir de forma diferente.

Não se trata de realizar uma intervenção com o objetivo de impedir o uso da tecnologia, mas a promoção da psicoeducação familiar quanto

ao seu uso saudável, por todos, não esquecendo a importância do ajuste das práticas e modelos parentais (Abreu & Góes, 2011; King, Delfabbro & Griffiths, 2012).

Por outro lado, a infoexclusão ou a iliteracia digital dos pais é, igualmente, uma oportunidade de concretizar uma mudança no sentido da aprendizagem – os pais aprenderem com os filhos (esta componente, que é nova nas famílias atuais, é igualmente importante, na medida que pode ser um espaço concreto para o diálogo e comunicação familiar). Contribui-se, assim, para uma construção de um novo significado das relações, quer com a família quer com a tecnologia.

As práticas parentais para a gestão saudável do comportamento online em família podem basear-se nas seguintes orientações genéricas: a) negociação do acesso e uso das TIC para e com todos os que integram a família, com esclarecimento claro e objetivo das regras, limites, exceções e consequências; b) supervisão do acesso e uso das TIC em crianças e adolescentes, definindo quem e como é feita a supervisão do tempo e dos conteúdos; c) promover o encontro da tecnologia num local específico (e.g. reunir todos os parelhos numa divisão da casa), durante os períodos de descanso (e.g. período das sestas e de sono noturno); d) promoção de um dia e/ou uma atividade sem a tecnologia (e.g. ida ao parque; andar de bicicleta) e) associar o uso das TIC à realidade (e.g. visitar um museu de forma virtual e depois presencial); f) utilizar as TIC como uma das recompensas possíveis para o comportamento adequado, e não a única forma de reforço positivo; g) promover uma visão critica do comportamento online e dos consumos online, que favoreça a autorregulação do comportamento.

Intervenção com a comunidade: a prevenção!

A coerência da gestão do comportamento online pela comunidade educativa alargada é fundamental. Não se quer correr o risco de ter pais a autorizar o uso do smartphone na escola e professores a proibir o seu uso. Assim, não se está a contribuir para a regulação do comportamento, nem das crianças, nem dos adultos.

A comunidade pode e deve avaliar e intervir à medida das necessidades da população que serve. A comunidade são todos, desde o cidadão às instituições.

Relata-se de forma breve alguns projetos que tiveram como objetivo trabalhar com a comunidade envolvente a promoção de comportamentos online saudáveis.

O projeto "Escolas ONLINE" no Concelho de Odivelas englobou a comunidade educativa alargada – alunos; professores e técnicos dos serviços de psicologia e orientação (SPO); pais, mães e encarregados/as de educação; assistentes operacionais; técnicos e profissionais de saúde, com o obje-

tivo de produzir um Guia com um conjunto de orientações e estratégias fundamentais para uma utilização saudável das tecnologias e da internet em contexto educativo, a partir das reflexões produzidas por todos os grupos participantes. A partir deste passo esta comunidade pode desenvolver projetos na área da gestão dos comportamentos online, com base em premissas que todos acordaram (Raúl, Fernandes, & Patrão, 2018).

O projeto "In-Dependenci@s" no Concelho de Azambuja, que envolveu todos os alunos do 7º ano, de forma a avaliar os seus comportamentos online e delinear formação à medida sobre os riscos e vantagens das tecnologias, trouxe o desafio de colocar os jovens a pensar como devem regular o seu comportamento online e como podem ser modelo, a partir de formação entre pares, para os outros (Costa, Santos, & Patrão, 2018).

Estes projetos deixam claro o apelo de começar a trabalhar a promoção do uso saudável da tecnologia logo na primeira infância, à semelhança do que já se faz com outros comportamentos (e.g. alimentação, higiene, sono, segurança rodoviária).

Exemplo disso é a experiência relatada (Patrão, 2017) com uma sala de 5 anos de jardim de infância, onde o objetivo era simplesmente perceber o nível de informação sobre riscos e vantagens das TIC. Não houve surpresa: as crianças de 5 anos da turma em causa sabem quase tudo sobre os riscos e as vantagens das TIC e, mais do que isso, estão muito disponíveis para aprender. Desenham, escrevem, recortam, colam, pensam, dizem tudo o que sabem sobre as TIC. E, claro, perguntam!

Por excelência deveria ser nesta fase que se deveria apostar na regulação do comportamento online. Com certeza com efeitos positivos perante os desafios que vão defrontar na adolescência, na tarefa complexa de socialização, que acabam por desenvolver de forma mista – digital e presencial.

Conclusões

A leitura dos dados estatísticos sobre o acesso e uso da internet em todo o mundo, e em particular, em Portugal, indica que há um aumento exponencial do acesso e uso a toda a tecnologia que permite estar online e viver as mais variadas experiências virtuais, umas mais licitas que outras, sobretudo para as crianças e jovens.

Este capítulo abordou os riscos de estar online para a geração cordão, sobretudo para o desenvolvimento de um comportamento de consumo excessivo, alertando para dados de estudos nacionais quanto à existência de uma percentagem de jovens que apresentam os critérios para uma dependência online. A partir destes dados realizou-se uma discussão centrada na necessidade de construir dos tipos de respostas de ajuda: uma resposta clínica de ajuda aos jovens e famílias; e outra resposta no âmbito da prevenção, envolvendo a comunidade.

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APRENDIENDO CON ROBOTS EN EDADES TEMPRANAS

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Resumen

La robótica y el pensamiento computacional son tendencias educativas cada vez más interesantes, ya que actualmente se piensa que la próxima generación necesitará dominarlas para poder vivir conforme a los requerimientos de la sociedad futura. Su introducción en el aula desde edades tempranas es un elemento clave que está condicionado por el uso e interacción con el robot en el proceso educativo. Esta investigación se desarrolla desde un planteamiento transversal, en el que el robot se convierte en una herramienta activa para que los estudiantes aprendan contenidos propios del currículo oficial de diferentes disciplinas, a la vez que desarrollan otro tipo de competencias transversales, como el pensamiento computacional. Se presentarán los resultados de una intervención en la que se han repartido entre grupo control y experimental, 142 alumnos de 7-8 años de 5 colegios de Castilla-La Mancha (España) que han trabajado en la realización de tareas de interpretación de planos ligadas a aprendizajes curriculares de las áreas de Matemáticas y Ciencias Sociales, mediante la programación de pequeños robots sigue-líneas. Para evaluar el efecto de la intervención se realizaron pre y pos-test con instrumentos validados para medir la orientación espacial, el pensamiento computacional y la motivación de los alumnos participantes en el estudio.

Palabras clave: robótica educativa, orientación espacial, pensamiento computacional, motivación.

Introducción

La evolución social precisa de cambios, habitualmente proporcionados por la tecnología (Rincón-Rueda & Ávila-Díaz, 2016). En el momento actual la revolución tecnológica gira en torno a la tecnología digital. Resulta entonces necesaria la enseñanza de habilidades acordes al mundo en el que vivimos, de forma que los alumnos estén preparados para integrarse en la sociedad de forma natural (Cabero & Guerra, 2011) y continuar con el desarrollo y evolución social del momento (Ananiadou & Claro, 2009; Barr & Stephenson, 2011; Zapata-Ros, 2015). Para ello la escuela ha de introducir en el currículo desde edades tempranas la enseñanza del uso de las herramientas digitales y tecnológicas actuales, como ya han propuesto varias asociaciones como la National Science Foundation (NSF), la Computer Science Teachers Association (CSTA) y la International Society for Technology in Edducation (ITSE); y diversos investigadores (Angeli et al., 2016; Balanskat & Engelhardt, 2015; Barr & Stephenson, 2011; Bocconi et al., 2016; Brennan & Resnick, 2012).

La enseñanza de estas herramientas, a su vez, ha de ser contextualizada, de modo que permita el uso de la misma con un fin que no sea meramente la computación. La contextualización fuera del ámbito de la computación permite utilizar la tecnología como vehículo de aprendizaje de los contenidos ya relevantes en las aulas para el desarrollo integral del niño. Precisamente uno de los elementos que puede marcar la diferencia en el proceso de enseñanza-aprendizaje es el desarrollo del pensamiento computacional (Resnick et al., 2009), como enfoque de integración de herramientas, técnicas y conceptos fundamentales de la informática para la resolución de problemas de la vida cotidiana (Wing, 2006). Las habilidades que se pretenden movilizar con su generalización dejan patente la afirmación que ya anticipó el padre del construccionismo, Seymour Papert, de que se debe enseñar a programar a los alumnos, para que éstos no acaben siendo programados por los dispositivos (Blikstein, 2013), advirtiendo de los peligros de una sociedad meramente consumidora de tecnología (Resnick et al., 2009).

El presente trabajo se enmarca en una de las líneas de investigación que está desarrollando el grupo de investigación "LabinTic. Laboratorio de integración de las Tic en el Aula" de la Facultad de Educación de Albacete (UCLM), que pretende profundizar en el papel de la robótica educativa como herramienta de apoyo en los procesos de enseñanza-aprendizaje. En concreto, desde un planteamiento interdisciplinar, se pretende analizar los beneficios de trabajar tareas de orientación espacial e interpretación de planos, ligadas a aprendizajes curriculares de áreas no tecnológicas (Matemáticas y Ciencias Sociales), mediante la robótica. También se aborda el análisis de la motivación de los estudiantes en ambientes mediados por robots, como un elemento diferenciador que puede generar mejoras en el aprendizaje de los contenidos en el

aula, y que se debe tener en cuenta a la hora de planificar procesos de enseñanza-aprendizaje eficaces.

Robótica educativa

En el contexto de la educación en edades tempranas, uno de los informes internacionales más reconocidos, *The NMC/CoSN Horizon Report K-12* (Freeman, Adams Becker, Cummins, Davis, & Hall Giesinger, 2017), elaborado de manera conjunta por New Media Consortium (NMC) y el Consortium for School Networking (CoSN), y en el que se recogen las tendencias, tecnologías y desafíos que impulsarán el cambio educativo en un horizonte de cinco años, se reconoce, en sus dos últimas ediciones (2016 y 2017), que la robótica educativa será una de las tecnologías emergentes con mayores posibilidades de aplicación en contextos educativos, a corto plazo, de uno o dos años, sobre todo por la enorme diversidad de posibilidades que ofrece.

Desde que en la década de 1960, Seymour Papert introdujera LOGO, el interés por el uso de robots en las escuelas ha aumentado y se ha ido transformando de una integración tradicional en la que se implicaba el desarrollo de conocimiento técnico a partir de la construcción y programación (Barker & Ansorge, 2007), a posiciones más innovadoras en las que se concibe la robótica educativa como un sistema o contexto de aprendizaje que se apoya en el uso de robots para desarrollar habilidades y propiciar la adquisición de competencias en el alumnado, no exclusivamente en áreas técnicas, sino también en otras como las matemáticas, las ciencias sociales, naturales y experimentales o las ciencias de la información y la comunicación, entre otras (Karim, Lemaignan, & Mondada, 2015).

Autores como Gaudiello & Zibetti (2016) establecen tres paradigmas de aprendizaje relacionados con la robótica educativa según el hardware y software utilizado y la interacción permitida por el robot: (1) *learning robotics,* cuando los estudiantes usan el robot como plataforma para aprender robótica desde planteamientos técnicos, de producción o de ingeniería; (2) *learning with robotics*, los robots se utilizan como asistentes/ayudantes que acompañan a profesores y/o estudiantes en el proceso de enseñanza/aprendizaje; y (3) *learning by robotics*, los estudiantes aprenden los contenidos de diferentes disciplinas y desarrollan todo tipo de competencias transversales, mediante la robótica. En este último paradigma de aprendizaje, también conocido como *robotic-based instruction,* el robot se convierte en una herramienta activa para profesores y estudiantes que media entre todas las dimensiones del proceso educativo.

En este sentido, entre las todavía escasas investigaciones que analizan la integración de la robótica en las aulas (Benitti, 2012; Toh, Causo, Tzuo, Chen, & Yeo, 2016) se observan beneficios en motivación (Chin, Hong, & Chen, 2014; Karim et al., 2015), resolución de problemas (Lindh & Hol-

gersson, 2007), participación (Toh et al., 2016), trabajo en equipo (Varney, Janoudi, Aslam, & Graham, 2012), aprendizaje cooperativo
(Denis & Hubert, 2001), entre otros. Asimismo, la introducción en las aulas del pensamiento computacional, a través de la programación visual por bloques (Román-González, 2016), permite a los estudiantes participar en experiencias de aprendizaje altamente interactivas y atractivas (Chang, Lee, Wang, & Chen, 2010), aspectos que mejoran el aprendizaje (Bowman, Hodges, Allison, & Wineman, 1999).

Material y métodos.

Para dar respuesta a los objetivos planteados se realizó un diseño de investigación cuasi-experimental mediante la comparación de los resultados pretest-postest entre dos grupos (control y experimental) en diferentes instrumentos validados para medir la orientación espacial, el pensamiento computacional y la motivación de los alumnos participantes en este estudio.
En la intervención participaron un total de 142 alumnos/as de entre 7 y 8 años de cinco Colegios de Educación Infantil y Primaria de la Comunidad Autónoma de Castilla-La mancha (España), distribuidos por género entre grupo control y grupo experimental tal y como se recoge en la Tabla 1.

Tabla 1.
Información demográfica de los participantes en la intervención.

Grupo Control			**Grupo Experimental**			**Total**		
F	**M**	**Total**	**F**	**M**	**Total**	**F**	**M**	**Total**
27	32	59	47	36	83	74	68	142

Ninguno de los grupos tenía experiencia previa en programación ni en trabajo con robots y partían de niveles similares en habilidades de orientación espacial e interpretación de planos.
En cuanto a los instrumentos utilizados, para evaluar la capacidad de orientación espacial se eligió una adaptación del *Map Test for Children* (Peter, Glück y Beiglböck, 2010), con 16 elementos en los que se muestran dos vistas de un mapa y en el que los alumnos/as tienen que identificar el edificio marcado con un punto en una de las dos representaciones.
Para medir el dominio de los alumnos/as sobre el pensamiento computacional, se utilizó una adaptación de la prueba *Computational Thinking Test* (Román-González, Pérez-González, & Jiménez-Fernández, 2017; Román González, 2016) que evalúa diferentes elementos del pensamiento computacional (10 ítems).
Las dos pruebas anteriores fueron evaluadas de forma binaria, correctos (1) o incorrectos (0), asignando a cada alumno una puntuación calculada según el número de respuestas correctas.

Finalmente, con respecto a la motivación, se empleó una adaptación del Instructional Materials Motivation Survey (IMMS) de Keller (2010). A partir de 36 ítems medidos por una escala Likert de 5 puntos (1 totalmente en desacuerdo a 5 totalmente de acuerdo) aborda las cuatro dimensiones de las que según el modelo ARCS de Keller (1987), se compone la motivación: atención, relevancia, confianza, y satisfacción.

Descripción de la intervención.

La intervención duró dos horas en ambos grupos, durante las cuales tanto los componentes del grupo control como los del experimental, completaron el mismo conjunto de tareas relacionadas con la interpretación de planos, diseñadas a partir de los estándares de aprendizaje establecidos en el currículo oficial en las áreas de Matemáticas y Ciencias Sociales. Las tareas estaban inspiradas en ejercicios similares de los libros de texto de su nivel educativo, en las que en una primera fase por equipos de cuatro o cinco integrantes y después individualmente, debían describir y efectuar recorridos sencillos sobre un plano, que se correspondía con su contexto más cercano, su localidad. Para ello, se les facilitó un mapa en tamaño A3 a cada equipo y otro en tamaño A0 en el centro del aula, que les servirían de referencia. A modo de ejemplo, una de las actividades propuestas fue: "Un amigo tuyo se encuentra en la carretera de Valencia y quiere ir al Museo. ¿Qué recorrido le recomendarías? Escribe el mensaje que le enviarías con las instrucciones necesarias". Todos los puntos de inicio y final de las rutas requeridas en las diferentes tareas correspondían a las ubicaciones explícitamente indicadas en el mapa.
La única diferencia entre grupo control y experimental estribó en que, en este último, los alumnos/as completaron las tareas con el apoyo de un pequeño robot, llamado Ozobot, programable a través de una herramienta web de programación visual por bloques (https://ozoblockly.com/). A través de tablets trabajaron fundamentalmente sobre dos instrucciones: i) *Follow Line to Next Intersection or Line End*, que permite que los Ozobots sigan una línea hasta alcanzar una intersección o el final de la línea, y ii) *Pick Direction,* que ofrece a los usuarios la posibilidad de codificar una elección direccional (izquierda, derecha, adelante o atrás) cuando el *Ozobot* llega a una intersección o un final de línea. Una vez programada la secuencia se comprobaba si las instrucciones habían sido correctas sobre el mapa A0 ubicado en el centro del aula.

Resultados

a) Orientación espacial e interpretación de planos.

En la Tabla 2 se pueden observar los promedios agrupados y las desviaciones típicas en la comparación entre grupo control y experimental de los resultados obtenidos en la evaluación de la orientación espacial e interpretación de planos a partir del instrumento *Map Test for Children* en el pretest, postest y la ganancia entre ambos.

Tabla 2.
Medias y desviaciones típicas en orientación espacial e interpretación de planos.

		Pre		Post		Diferencia	
n		M	SD	M	SD	M	SD
Grupo Control	59	9.46	3.41	10.29	6.58	0.83	2.45
Grupo Exp	83	10.10	3.56	12.05	2.90	1.95	3.03
Total	142	9.83	3.50	11.32	3.30	1.49	2.85

Los resultados en el grupo experimental aumentan cerca de dos puntos tras finalizar la intervención; muy por encima, también, de la ganancia que manifiestan los alumnos/as del grupo control.

b) Pensamiento Computacional.

En cuanto a los resultados sobre el nivel de desarrollo del Pensamiento Computacional, las medias sobre las puntuaciones obtenidas en los 10 ítems adaptados del Computational Thinking Test, centrados en la medición del dominio de los alumnos/as con respecto a secuencias y bucles, muestran también mejores valores en el grupo experimental.

Tabla 3.
Medias y desviaciones típicas en Pensamiento Computacional

		Pre		Post		Diferencia	
n		M	SD	M	SD	M	SD
Grupo Control	59	2.92	1.88	4.10	2.09	1.19	2.20
Grupo Exp	83	3.35	1.82	4.86	2.20	1.51	2.37
Total	142	3.17	1.91	4.54	2.18	1.38	2.30

c) Motivación.

Partiendo del modelo ARCS de Keller (1987; 2010) la motivación se compone de la interacción entre cuatro dimensiones: la atención, la relevancia, la confianza y la satisfacción. La primera surge si el alumno advierte una brecha entre su conocimiento actual y el que se está adquiriendo; la segunda depende de la percepción de utilidad de esos aprendizajes; la tercera varía en función de la confianza; y la cuarta es la dimensión sobre la que las anteriores convergen, condicionando la predicción de buenos resultados durante la realización de la tarea.

Tabla 4.
Medias y desviaciones típicas en motivación.

	Grupo Control (n=29)		Grupo Experimental (n=63)	
	M	SD	M	SD
Atención (A)	2.96	0.38	3.39	0.54
Relevancia (R)	3.16	0.52	3.62	0.73
Confianza (C)	3.07	0.43	3.58	0.58
Satisfacción (S)	3.67	0.74	4.24	0.75
Total	3.16	0.31	3.63	0.49

La comparación de los resultados entre ambos grupos (control y experimental) ofrece diferencias siempre a favor de los alumnos/as que han participado en la intervención mediada por robots. Asimismo, llama la atención el promedio tan elevado de la categoría Satisfacción en el grupo experimental, muy cercano a la puntuación máxima.

Conclusiones.

Los resultados muestran que el uso de robots como herramienta de apoyo en contextos educativos con alumnos de edades tempranas (7-8 años) aporta beneficios en diferentes dimensiones del proceso de enseñanza-aprendizaje. Se perciben mejoras en la adquisición de contenidos curriculares transversales relacionados con la orientación espacial e interpretación de planos, en línea con las conclusiones encontradas en otros estudios (Coxon, 2012; Juliá & Antoli, 2017). Asimismo, debido a que los robots necesitan ser programados, nuestra intervención da la razón a Resnick et al. (2009) en cuanto a su repercusión en el desarrollo de habilidades de pensamiento computacional de forma positiva. Y también se hallan en concordancia con los beneficios encontrados por Chin, Hong & Chen (2014) y Karim, Lemaignan & Mondada (2015) en cuanto a motivación.

Por lo tanto, el aprendizaje con robots a edades tempranas parece resultar beneficioso en el aprendizaje transversal del alumnado durante la enseñanza de contenidos propios del currículo. No solo potencia el aprendizaje, debido al aumento de la motivación, en especial a la dimensión satisfacción; sino que aporta y mejora habilidades necesarias para el alumno/a en el contexto actual y futuro.

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