

RESEARCH

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USABILITY OF SMARTPHONES IN CHILDHOOD: CASE STUDY THROUGH PHOTOGRAPHY**USABILIDAD DE LOS SMARTPHONES EN LA INFANCIA: ESTUDIO DE CASO A TRAVÉS DE LA FOTOGRAFÍA** **María M. Rodríguez-Rosell¹**: Catholic University of Murcia. Spain.
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imelgarejo@ucam.edu**ABSTRACT**

It is normal to see children between 3 and 6 years interacting with smartphones. They are digital natives who make use of various functionalities that these devices possess, in order to access and consume audiovisual products such as video games, photographs, videos, etc. Smartphones are instruments designed under a market strategy designed to facilitate access to games, videos and music at any time and place. Children easily access the use of this technology, who nevertheless find limitations in its use, normally imposed by the parents who donate those who finally must schedule the times and contents to which their children will be exposed. Photography is one of the most common activities carried out through a smartphone by children, in addition to playing or viewing audiovisual documents. The experience we propose turns the child into an active subject of the research itself as it appears in the center of the study as a producing subject and not only as a subject. We are interested to know what the perception that 5-year-old children have of using smartphones, and above all, to analyze how the photographic products they are capable of doing are in practice. We address this reality through a kaleidoscopic methodology and the development of varied techniques.

KEY WORDS: smartphone – childhood – photography – kaleidoscopic methodology – proficiency – literacy – phone.

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RESUMEN

Ver a niños de entre 3 y 6 años interaccionando con los smartphones forma parte de nuestro paisaje urbano más natural. Nos encontramos ante nativos digitales que hacen uso de diversas funcionalidades que poseen estos dispositivos, con el fin de acceder y consumir productos audiovisuales como videojuegos, fotografías, vídeos, etc. Son instrumentos diseñados bajo una estrategia de mercado, pensados para facilitar el acceso a juegos, vídeos y música en cualquier momento y lugar. Esto provoca la facilidad de acceso y uso de esta tecnología por parte de los pequeños, que, sin embargo, encuentran limitaciones en su uso, normalmente impuestas por los progenitores que son los que finalmente deben pautar los tiempos y los contenidos a los que se expondrán sus hijos. La toma de fotografía es una de las actividades más habituales realizada a través de un smartphone por los niños, además de jugar o ver documentos audiovisuales. La experiencia que planteamos convierte al pequeño en un sujeto activo de la propia investigación, ya que aparece en el centro del estudio como sujeto productor y no sólo como sujeto. Nos interesa saber cuál es la percepción que los niños de 5 años tienen del uso de los smartphones y, sobre todo, analizar cómo son en la práctica los productos fotográficos que son capaces de hacer. A través de una metodología caleidoscópica y del desarrollo de técnicas variadas abordamos esta realidad.

PALABRAS CLAVE: smartphone – infancia – fotografía – metodología caleidoscópica – competencia mediática – alfabetización – teléfono.

USABILIDADE DOS SMARTPHONES NA INFÂNCIA: ESTUDO DO CASO ATRAVÉS DA FOTOGRAFIA

RESUMO

Ver a uma criança de 3 a 6 anos inter-relacionando com os smartphones forma parte de nossa paisagem urbana mais natural. Nos encontramos diante de nativos digitais que fazem uso de diversas funções que possuam estes dispositivos, com a finalidade de aceder e consumir produtos audiovisuais como videojogos, fotografias, vídeos, etc. São instrumentos desenhados para uma estratégia de mercado, pensados para facilitar o acesso a jogos, vídeos, músicas, em qualquer momento e lugar. Isso provoca a facilidade de acesso e uso desta tecnologia por partes das crianças, que embora, encontram limitações no uso, normalmente impostas pelos pais que são os que finalmente devem pautar os tempos e os conteúdos que usaram seus filhos. A toma de fotografias é uma das atividades mais habituais feita pelas crianças através de um smartphone, ademais de jogar ou ver vídeos. A experiência que propomos converte a criança em um sujeito ativo da própria investigação, já que aparece no centro do estudo como sujeito produtor e não somente como sujeito. Nos interessa saber qual é a percepção que as crianças de 5 anos têm no uso dos smartphones e, sobretudo, analisar como são na pratica os produtos fotográficos que são capazes de fazer. Através de uma metodologia caleidoscópica e do desenvolvimento de técnicas variadas abordamos esta realidade.

PALAVRAS CHAVE: smartphone – infância – fotografia – metodologia – caleidoscópica – habilidade mediática – alfabetização – telefone.

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1. INTRODUCTION

The relationship between childhood and mobile devices is a clear reality in multiscreen society. Nowadays, the family nucleus is one of the conducive contexts for children between 3 and 6 years old to use smartphones and that is where aspects such as usability, the times spent in their handling and parental supervision come into direct relationship. All this can cause conflicts between the child and the parents, especially if those three basic elements are forgotten, key aspects that must be taken into account when the child comes into direct contact with this type of technology. As stated by various authors in recent years, the relationship between mobile technology, the child and the family has become an 'indissoluble fusion' (González-Fernández, Salcines-Talledo and Ramírez-García, 2018; Pérez -Escoda and Contreras-Pulido, 2018) which implies new educational methods and new challenges in the field of research on the implications - social, educational, communicative and family-related - that these systems have for children. In this sense, in the last decade, the rise of this relationship has led to several studies that show the access of minors to mobile technology: "Smartphone, minors and vulnerabilities. Literature review" (Martínez-Pastor, Catalina-García and López de Ayala-López; 2019), "Media Use by Kids age Zero to Eight" (Common Sense Media, 2017), "Equipment and use of information and communication technologies at home" (INE 2016), "Net Children Go Mobile. Internet risks and opportunities and use of mobile devices among Spanish minors (2010-2015)" (Garmendia, Jiménez, Casado and Mascheroni (2016), "Young Children (0-8) and Digital Technology: a qualitative exploratory study across seven countries" (Chaudron, 2015)", "Minors and mobile connectivity in Spain: Tablets and Smartphones" (Cánovas, García-De-Pablo, Oliaga-San-Atilano, Aboy-Ferrer (2014), "Digital generations. Children, young people and New Media" (Buckingham and Willet, 2013), among others. This type of research indicates that access to smartphones occurs at a very young age, as these devices are part of the family environment, the use of technology mobile becoming something everyday for children, so authors who have focused on the study of preschool children point out that, in various countries of Europe, children between the ages of 0 and 8 years are prone to the use of these mobile devices that they access through their parents. In fact, access and connection to the Internet made by children, when we focus on ages ranging from 3 to 6, is frequent (Chaudron, 2015).

We are faced with digital natives who interact with smartphones to make use of various functionalities that these devices have, in order to access and consume

audiovisual products such as video games, photographs, videos, etc. This aspect will be reflected throughout the study presented herein. In this sense, we are facing a technological tool whose purpose, when we talk about minors, is entertainment. As Carrasco, Droguett, Huaiquil, Navarrete, Quiroz and Binimelis (2017) point out, they are instruments designed under a market strategy where the devices are designed to facilitate access to games, videos and music at any time and place. This means that, from 3 to 6 years of age, access is usually limited and parents are in the position of having to schedule the time and contents to which their children will be exposed. That is why the child only make use of a few features or APPs out of the many offered by the smartphone. Thus, in 2008 José Sánchez reflected the importance of the generational gap between children and their parents, which sometimes causes parents not to be able to understand what their children experience with these types of instruments. Here the educational guidelines promoting media literacy since an early age come into play; however, in the various studies we observed how the immersion between the child and the technology is positive, "but in turn limited and oriented by certain interests, which implies that finally the digital literacy of children only covers some areas, and not necessarily the most relevant to education, where again parents' knowledge becomes a barrier" (Carrasco, Droguett, Huaiquil, Navarrete, Quiroz and Binimelis, 2017, p. 133).

This study considers the child to be a prosumer, capable of generating content through mobile devices, and not only a consumer of products distributed through APPs, a child capable of capturing images of the reality that surrounds him. We try to give voice to the child through his productions, in this case his photographs, which may be more or less artistic, more or less perfect, more or less adjusted to photographic principles, but which, without a doubt, constitute an object of study that manifests the skills that the child can acquire by handling a mobile device, which is already part of his daily life. The methodologies that try to bring us closer to realities through the use of the still image are not new. Recall the technique of 'Fotovoz', that cultural manifestation that allowed, back in the 1980s, to bring to light those silenced aspects of society, to give them light and generate reflection and debate about them. From there, photography is positioned as another element to take into account in research projects of a social, educational, sanitary nature..., until today we consider their implementation with minors in order to generate participation in social improvement since the early school stages (Doval, Martínez-Figueira, Raposo, 2013). With this methodology, the child becomes a co-protagonist, capable of generating his own photographs and then giving his opinion, that is, giving an explanation about it. In the case at hand, to argue the reason for the photographed element, its position (angulation), focus, plane typology... In addition, this method facilitates direct observation during the process of taking photographs, which will demonstrate the technological skills and abilities that the child masters. The link between the world of photography and minors is not new; if anything, it has increased more recently with the inclusion of 'camera' applications inside mobile devices. Since they are born, they are exposed to be photographed, any event or action they perform during their childhood is likely to be immortalized by the camera of a smartphone. But they are not only the subject to be photographed but, as they grow older, they become sharp amateur photographers capable of capturing their

own images with their parents' devices. Because, beyond being a space for virtual gaming, the smartphone allows them another series of functionalities, in this case, to immortalize moments as a means of expression, creativity, emotion and even play. As we have already pointed out in previous studies that have occupied our research interest:

The use of the camera, smartphones and tablets to capture images is a technology capable of favoring audiovisual literacy among children that allows them to prepare to face new environments and digital platforms, so that they can be both critical recipients of the information they receive and producers responsible for their own visual messages, capable of making proper use of the different mobile devices (Rodríguez-Rosell and Melgarejo-Moreno, 2018, 357).

In short, photography linked to minors through the smartphone means to this study that the child becomes the protagonist and that both the process of capturing images and the photographs themselves are a valid and accessible instrument in this and also for future research in which the child becomes the voice of his skills and abilities in media literacy.

2. OBJECTIVES

The main objective of this study is to know the reality of the use of smartphones made by minors and, specifically, the use of those tools linked to the field of photography. Therefore, a little studied scientific reality is revealed, due to the age of the subject under study: 5 years. Research related to childhood is scarce when we focus on aspects that fall outside the scope of the toy or food. However, there are technological tools that, today, are part of the child's daily environment, such as smartphones. Since their earliest childhood, children live with this technology and it is not uncommon to see children making use of them. However, at these early ages, the use of the smartphone is limited: access to videos, images or video games. Hence, it is interesting to know the level of recognition of the child to certain applications and their skill in use.

Make use of a kaleidoscopic methodology, given the special nature of the individuals studied during these ages. Therefore, the methodology used is close to the use and implementation of varied, diverse and complementary tools that have allowed the observation of children from multiple perspectives, especially in order to achieve valid and reliable results.

This piece of research aims to highlight a current reality that will allow us to know the relationship between photography and childhood and that shows how the child, at an early age, is able to cope with technical and audiovisual competence through images, through the use of the camera tool that smartphones have.

3. METHODOLOGY

Setting out a methodology in which the object of study is linked to childhood implies different aspects to consider and involves various hardships to be faced due

to the peculiarities of the age group that we face. In this sense, we implement a methodology designed on the basis of different perspectives that address aspects related to visual, verbal and manipulative approaches, such as: taking pictures via a smartphone, manipulating different toys, recognizing applications (APP) and relaxed talk with the children. This allows us to obtain a stereoscopic view of the observed reality and makes the child the protagonist of the research process. As already indicated in 2012 by Ortiz, Prats and Baylina, it is necessary to "promote research not on children but for and with children", this will allow us to create an ideal and relaxed environment to integrate them properly in the context where we want the experience to develop.

In the case of this piece of research, languages will have an important presence, since facing children of 5 years of age implies the choice of managing languages the child feels comfortable with and is able to decode easily. In this sense, a methodology based on written language would involve difficulties in communication due to the lack of skill and fluency that the child has in the management of written communication - what is known as reading-writing skills. Thus, and considering previous research (Einarsdottir, 2010; Harris and Barne, 2009; Theobald and Kultti, 2012; Coleyshaw, Whitmarsh, Jopling and Hadfield, 2012), among the multiple languages that the child can master with some skill, in this piece of research, oral and visual communication is chosen.

With all these aspects we would be carrying out what Rodríguez-Rosell and Melgarejo-Moreno call a kaleidoscopic methodology (2018) in which the protagonist voice of the child is revealed. Based on informed consent (Castro-Zubizarreta, Caldeiro-Pedreira, Rodríguez-Rosell, 2018), a global methodology is put into practice in which the child is considered an active subject. To this end, three fundamental principles that must be present in any research in which minors are included have been taken into account: provision, protection and participation. Being a piece of research in which the use of technology by children is included, freedom of participation should be sought, hence the techniques used in the study invite it. Thus, direct conversations with children, photography and semi-structured interviews have been used. In addition, and although it is not part of the full development of this piece of research, to contrast the collected information, a focus group has also been carried out with the parents of the children involved in the process, which will allow us to contrast both data in future research proposals. In order to carry out a scientific process in which autonomy is encouraged, the context chosen to carry out the designed dynamics was a meeting point away from the school environment, so that the child could not associate the school with the process in which they were going to get involved. Time is another key in research with children, hence the sessions have not exceeded 15 minutes, especially with regard to the conversations.

Next, we present the phases carried out in the research process:

1. Conversations with children, called the Pre-test phase. First contact with the aim of breaking the possible communicative barriers of being in a new context and with an unknown person and managing to ask the questions of interest that we want

them to answer. This phase is composed of 21 open questions, distributed in three blocks: use, time and supervision. The choice of the interview as a tool is manifested as a dynamic resource easy to adapt to the context and the sample to which it is addressed, in this case minors. It is decided to resort to the semi-structured interview or also called the ethnographic interview that gives flexibility, but allows us to follow a pattern of previously designed questions, which, in addition, as indicated by experts in this field, can be adapted and where the interviewer can motivate and even intervene to make clarifications (Díaz-Bravo, Torruco-García, Martínez-Hernández, Valera-Ruiz, 2013). Being addressed to a child target, we tried to achieve a relaxed atmosphere through friendly conversation with the little ones, where the role of the interviewer has been limited to directing the interview, listening carefully and not making interpretations 'in situ' on the responses of the little ones. In this sense, it is sought to carry out a field work that allows us to obtain a qualitative vision to understand the uses, the times and the supervision that the minors detect when they are exposed to a specific technology, the smartphone.

2. Take pictures to get personal visual references of the use of the smartphone (Test). During the development of this phase, the child has to interact with the smartphone and, to this end, various everyday objects contained in a cube are provided: a ball, a miniature car, a puzzle, a doll, a shovel, cards, a whistle, a bottle, a cup and colored pencils that the child will have to photograph, in addition to having to take a picture of a person. In this phase of research, some prerequisites have been met, since the minor has to manipulate a specific technological product. For this purpose, we have been guided by the guidelines developed by the organization for encouragement, advancement and promotion of social research and markets worldwide (ESOMAR, 2012). Thus, it is necessary to have the consent of the parents and, above all, the researcher must take special care to check certain aspects such as: safety of the product that is going to be manipulated (smartphone) and non-participation in actions that imply illegality (display of contents not suitable for certain ages). This type of technique, which some theorists call a game interview, has been used when the sample under study does not exceed 7 years of age (Freire, 2017). It is up to this age when children love to manipulate and leave the routine of the mere verbal interview to enter the game world where they interact with objects that, in this case, will provide relevant data on the manipulation of the smartphone and the identification of some of its applications (camera), which fully coincides with the age of the sample used in this piece of research that is framed in 5 years.

3. Semi-structured interview (Post-test) that will help us understand the previous phase and in which children can explain aspects related to the photographs taken: perspective, type of plane, colors, focus, object, framing, etc.

4. Focus group with parents. An attempt has also been made to know the parents' vision in one of the topics that can also yield relevant data on children's use of their parents' mobile devices in the family environment. In this sense, the discussion group has been made up of three thematic blocks that have guided the progress of the parents' conversations: use (8 questions), time (5 questions) and supervision (8 questions). This research technique was chosen because it makes it possible to

understand the opinions and attitudes towards certain products from the user's perception with quality (Barrios and Costell, 2004; Ivankovich-Guillén and Araya-Quesada, 2011), in this case, the product would be the smartphone and the perception would be focused on the uses, times and supervision they exercise of their children when they use the mobile device.

Research with children implies that the sample with which one works is smaller than when it comes to adults. Above all, due to the techniques used for the collection of data, which requires maximum attention (observation) by the researcher. This aspect implies that the working groups are made up of a group of children (5 years old) who are in the third year of Early Childhood Education. In total, the study collects the data provided during the process by a sample of 55 children belonging to schools in the Region of Murcia. Likewise, in the part corresponding to *the focus group*, there have been 6 parents who have participated in this part of the study. Through directed conversation and for 30 minutes, the parents have been able to express those aspects that imply the use, time and supervision of their children when they interact with smartphones. The answers provided by the parents will serve in the future to carry out a comparative analysis between the data obtained through the children's responses during the Pre-test phase of this study and those collected through the *focus group*, thus facing two disparate realities.

Once all the fieldwork has been done, both with parents and children, the working group enters a phase of analysis of the recordings provided during the Pre-test and *focus group* phases. In this sense, as it is about the use of qualitative tools, where the questions asked are open to give rise to the conversation, objective interpretation is fundamental, hence the information provided by the children is contrasted with that expressed by the parents. It has also been necessary to analyze the content of photographs taken by children and their respective explanations provided by the Post-test. This way, elements related to the world of the image that would involve the development of skills related to the field of audiovisual language have been taken into account.

4. RESULTS

4.1. Pre-test

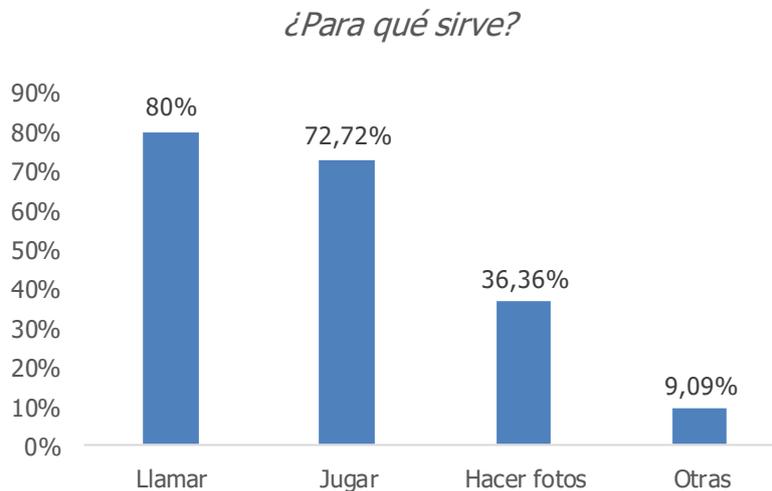
4.1.1. Pre-test. Use

As explained above, in this first phase, questions of a different nature and intention are addressed. Under the name of *Use*, some questions relevant to us to determine the children's perception of the usability of technological devices such as smartphones are answered.

Can you recognize a mobile? 100% of the consulted children can recognize a mobile phone, its appearance and they consider it a common technological device.

What does it say it is for? There are varied responses offered by children to this question, but without a doubt "Call" appears among the prominent (80%), along

with "Play" (72.72%) or "Take pictures" (36.36%). It is obvious that they understand and associate the main use with the telephone, but they also find it to be an attractive device to play with. Other alternatives such as "See photos", "Download games" or "See audiovisual products" still do not gain relevance among children of these ages, these answers being found only in 9.09% of respondents.



Graph 1: *What is it for?*
Source: Self made.

In this sense, it is curious to compare another of the answers included in this section of *Use* that refers, not only to the use the child understand the mobile should have, but to the real use the child makes of it. Now the highest percentage is "Play" (100%). Only 18.18% say they use it to "Call", logical if we consider the age of the interviewees (5 years). This roundness in the response that associates the use of mobile phones with game gives meaning to the emergence of a new question that asks children about the games they use on mobile phones. None of the answers offers a clear alternative about the name of a specific game, since many of them cannot determine the real name of the games, but do associate it with the action they develop or with a character known to them ("to games of Spiderman", "of Pepa Pig", "cooking or makeup games", "game of fish, monsters", "one about a farm", "motorcycle racing"...). In none of the answers is there any presence of educational games, associated, for example, with some specific basic competence of the Early Childhood Education curriculum such as mathematical or language skills, among others.

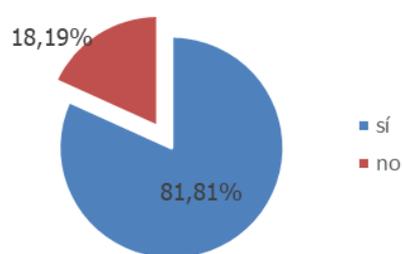
Do you use it? Do you like to use it? It is a double-nature question that is answered by children with a resounding statement. Everyone says that they use it and that they like to use it (100%).

Where do you use it? In what places? 71.12% of the answers refer to environments that are located at home (rooms, places or certain locations within their homes). Thus, 36.36% place the use of it at home, the same percentage on the sofa and 27.27% in their room. Only 9.09% of them visualize their use on the street

or in the car, and in the first case associated with a specific activity related to a game; This is stated by one of the participants: "...or on the street with my parents, when we go hunting Pokemon".

Do you take pictures with your mobile? The vast majority of the interviewees (81.81%) claim to use the mobile phone to take photographs, although curiously, at a previous time of the meeting, that use ("Take pictures") was not the most prominent, since only 35% considered it among the usual uses of the mobile phone. Only 18.19% said they did not take photographs with it.

¿Haces fotografías con el móvil?



Graph 2: *Do you take pictures with your mobile?*

Source: Self made.

In line with this use of the image through the mobile they were also asked: "*Do you check photographs or videos on the mobile?*" And this time around 9% did not know what to answer, another 9% said no and the overwhelmingly remaining 81.81% said yes.

If we compare the answers obtained in this aspect of the digital image, we verify that the child is not only able to consume audiovisual products but also to produce or create this type of documents since an early age, although their quality cannot be determined at the moment. One of the qualities that gives more value to this experience, in our opinion, is to try to see how children are able to "materialize" and not just "think" about a fact. Most of the research done with children raises questions that have to do with a simple perception of a fact that the child is facing, but research must overcome this theoretical level and go up one step, linked more to practice and quality, and try to demonstrate what the reliable reality of the concrete fact is. Hence, the interview has been organized based on three differentiated blocks: the Pre-test, the Test and the Post-test, and it is precisely based on these questions related to the taking of photographs that subsequent research of the Test and the Post-test is designed.

4.1.2. Pre-test. Time

Within this first phase (Pre-test) there are other types of questions referred to the *Time* of use of the technology, although the concept of time in children of these ages is still diffuse and unclear. Being 5 years of age, the child is able to recognize the

phase of the day he is in but only has basic notions about space, without acquiring a clear idea about it. It is an abstract concept difficult to understand in this phase of evolutionary development.

When can you be with the mobile? This time the answers have to do with the perception children have of the time they do not spend at school. 72.72% of children relate this concept of "when" to leisure time or when there is no relevant activity ("weekend", "when there is no school", "on vacation", "when I rest", "When my mother makes the food", "in the pool"...). The rest does not clearly define this temporary concept and refers to other aspects such as having or not having parental permission to use it. That is, children have internalized that the use of mobile phones refers to leisure time, away from the teaching/learning process of schools or educational environments.

However, when asked *How long?* the answers we obtained are clearer but also very ambiguous. 63.63% consider that the time they dedicate is little, but adequate. The expression that children use most to define it is "a little while", 18.18% do not know and only 9.09% are able to clearly define the amount of time "fifteen minutes", although in the development of the interview we observe that the accuracy in this response is due to the directed order of an adult. However, another question was added in the interview that had an impact on the perception of the amount of time spent on its use, and in this sense, slightly more than half of them considered that the time spent was "good" or was "a lot", While 36.36% stated that the time they used it was "little". If asked *would you like to use it more?*, curiously, almost 65% say they don't or don't know (45.45% and 18.18% respectively) and only 36.36% of children state an express desire to continue using it longer than the time they are allowed so far.

Who decides the time? More than 80% of children (81.81%) recognize their parents to be the adults who decide on the time of use, the proportion being 54.54% for mothers versus 27.27% for fathers. However, there are also some isolated cases of minors who use their cell phones secretly or who stand as those who decide how long to use it (9.09%). In no case have they presented as an alternative the existence of other relatives (uncles, brothers, grandparents, etc...) that imposed temporary limits of use.

We were interested to know if the children receive clear time-related orders in their family environment before starting to use the mobile phone and, when asked *Before you start using the mobile, do you know how long you can use it?* only 27.27% of the children stated strongly that yes; the rest did not know how to answer this question (18.18%) or said no, that at no time had they received time limits of time of use (54.54%).

4.1.3. Pre-test. Supervision

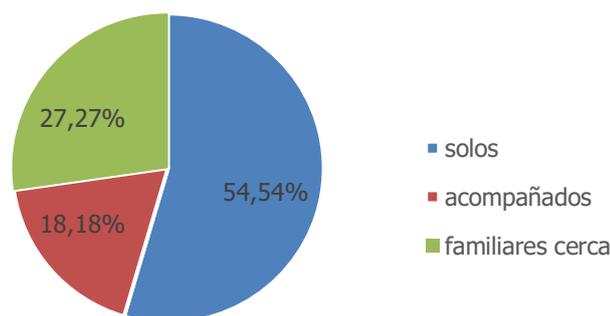
Especially enriching and valuable is this block of the interview since, through the obtained answers, scarcely predictable aspects stand out. The block called *Supervision* addresses the reality that children live when using mobile phones.

The vast majority of the interviewed children (90.90%) answer yes to the question "Do you have to ask permission to pick up the mobile? Or do you take it when you want?", it is logical to find this very high percentage because of the age of the participants in the study (5 years); only 9.09% say they do not comply with this imposed rule.

Are you alone using your mobile phone or are your parents/relatives with you? Just over half of participants say they are alone (54.54%) when they use it; only 18.18% say they are accompanied by their parents or a brother, and the rest say they feel accompanied even if their parents are not in the same room as them.

Curiously, loneliness does not seem to be the preferred state for children when facing the use of mobile phones. *Would you rather use your mobile phone alone or with the help of your parents?* It could be thought a priori that children prefer not to have the supervision of adults, however, none of the interviewed children said they want to be alone, 36.36% prefer their parents' help and 63.63% do not answer this question.

¿Estás solo/a utilizando el móvil o te acompañan tus padres/familiares?



Graph 3: *Alone or accompanied?*

Source: Self made.

What kind of content they can see on the mobile is another concern of ours, and so they are asked *Can you see everything you want on the mobile or do your parents decide what you can see and what you cannot?* 54.54% say they can see everything they want, although some point to some restrictions: "I can do everything, provided they are not blood games", "I can have all the games that don't cost money". About 20% say it is their parents (father or mother) who decide what can be seen on the mobile. Some of them point to craftiness to see content that their parents would not allow them to and say "I install applications when my parents are absent and then delete them".

80% say that *There are applications downloaded on the mobile that they like*, while the remaining 20% do not know or answer. That is, for the little ones, there

are attractive content downloaded on mobile devices although they are aware that there is a universe of products that they do not have access to.

They are asked on this occasion: *Are there applications that you would like to use but you are not allowed to? Do you know what they are called and what they consist of?* None can give an exact name to any of the programs they would like, although they are clear about what kind of programs they would be (usually games) or what kind of activities (*"killing games", "take pictures", "games that cost money"*). However, they are asked *"Do you know where to find programs for the mobile?"* And 72.72% say they know how to do it through shortcuts found on the screen (virtual store icons). A remaining 27.27% say the ones who install the programs are others (parents or brother).

We would end this first Pre-test phase by asking a question related to the activity of taking pictures via a mobile. *Do they let you take pictures with the mobile?* A large majority (72.72%) seem to be allowed to use the cell phone to carry out this activity. Almost 20% say they are banned from carrying out that action (and among them, some justify that fact and say they are not allowed to because they *"fill the mobile"*).

4.2. Test

This practical phase of research with children was developed on the basis of on three steps: the first one consists of the child being able to take 3 photographs of any of these objects: a ball, a miniature car, a puzzle, a doll, a shovel, cards, a whistle, a bottle, a cup and colored pencils. All of them are in a box and it is the child who can freely choose the objects and photographs.

In addition to this, the child will be asked to take a picture of a person's face (photograph / portrait of the researcher who has asked the questions).

Finally, they will be asked to search the mobile (in Gallery) for the photographs they have taken. If they do not know, the instructor will help them find them and that fact will be reflected in the data logbook.

The objective of this part is to analyze the photographs obtained by the children and describe the main qualities or characteristics of the photographed objects from a technical point of view. Let us not forget that, at this age, they begin to master the technological dimension, although not that of language and aesthetics. That is, surely all children are capable of taking photographs, and it is really interesting to analyze a photograph taken by a child, since they are not subject to the basic rules taught in art schools that condition our vision. Children do not know the rule of thirds or the golden ratio in composition, but they do pursue certain intentionality when choosing certain parameters to set a moment of reality.

The child understands photography as something entertaining and, without doubt, it is a fantastic instrument to develop his creativity and his ability to communicate. That is why it is so interesting to try to discover the reason for some photographs we

found, which serve a common pattern that pursues an intention. To develop this section, we will highlight only five basic aspects: format, framing, angulation, focus and type of plane.

The format chosen in 81% of the cases has been vertical. Remember that the format has to do with the relationship between the height and width of the photograph. Normally, children, when taking photographs with a conventional camera, choose the horizontal format, since the shape of the same camera invites that position. Something similar seems to happen to children when what they have in their hands to photograph is a smartphone, whose format is already vertical (taller than wide). Therefore, it is not surprising that a large percentage of the images we obtained consider that format, without what was photographed and the format itself having any apparent relationship.

Precisely because of the ignorance noted above that refers to the rule of thirds, that same percentage of images (81.81%) present the photographed object in the center of the composition. Only some place the object to the right or to the left, although all of them show straight horizon lines, parallel to the ground, which causes balance in the sample.

The angulation chosen for the taking of the photographs is especially chopped (63.63%), since they place the mobile above the object to be photographed, which forces them to tilt the device to find the required object. However, let us not forget that the point of view of children is different from that of adults, since they are shorter and that causes their normal point of view to always be below that of an adult.

Blurring is one of the characteristics that are repeated in practically all the shots (96.97%). The vast majority of the images are not clear, which suggests low skill and stability in the handling of these devices or that they pay more attention to the photographed object than to its focus.

Regarding the type of plane, there is variety among the set of images. Standing out are the general planes (63.63%) that serve a wide space in which a small-sized object is framed. The detailed planes of objects (18.18%) also stand out and, in the case of portraits of a person, all the photographs had a correct medium plane that organized the human figure in the frame.



Image 1. Example of photographs taken by children.
Source: Self made.

A final aspect to be assessed refers to the search for the photographs taken by children on the smartphone. Only 36% of them knew how to find them without the help of the interviewer, and they did so by locating the "Gallery".

4.3. Post-test

In this last phase, the children were asked to explain their photographs and highlight some element of them. There is no technical aspect that stands out from their compositions: no light, no color, no angulation or type of plane. They only consider the object itself and their personal taste for it (*"because I like animals very much", "I like that photo because I can see a little bit of each", "because I can see the ball clearly and I like football"...*).

5. CONCLUSIONS

These types of experiences are very valuable, since they make the child the protagonist and his voice offers first-class data. Despite meeting potential users of mobile devices, studies on these ages, from 3 to 6 years old, are not recurring in research, although as this study shows, their opinions can be very valuable for improving this type of applications.

One of the issues we detected is that children do not demand educational games, when asked about what games they like, at no time does a game in which the educational aspect predominates stand out. This aspect, perhaps, is related to the internalization they have of the use of mobile phones for leisure and free time, which are far from purely academic processes such as those related to educational environments. Thus, applications being free seems to be a feature to consider, since they are the most allowed apps by adults. And this statement goes further, because

parents allow them to download applications if they are free, without paying attention to content, age, etc., being free is what prevails.

More than half of the interviewed children have not received any order with a clear time limit before starting to use the mobile. And another worrying fact is that half of these children claim to be alone when they use the mobile. A piece of information that contrasts with the desire of children to prefer to be accompanied or supervised by the adults. It is curious that a high percentage of children do not want to use the mobile phone more frequently, in our view, it is due to the young age of the children, and it would increase at older ages.

A low percentage were not able to find their photographs without the help of the interviewer, which makes us think that their technological skills are still very incipient. Similarly, they do not master the technical and language aspects of photographic composition.

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