

CRAWLING, WALKING, SWIPING

GERMAN PRESCHOOL CHILDREN'S MOBILE TOUCHSCREEN USE

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ABSTRACT

Not only do adults find touchscreen media intuitive and simple to use so do young children who have no, or very few, technical or literacy skills. Children are engaging with touchscreen devices at an increasingly young age as a consequence of observing their parents' own use, and by playing games on their parents' smartphones or by using the family tablet to watch videos.

This article presents the findings of an exploratory qualitative study on the relevance of touchscreen media in the lives of two- to six-year-old German children, on their access to and use of these devices, and on the challenges and concerns parents perceive and the strategies they adopt when they encounter those challenges. Qualitative interviews with twelve parents and participant observations with their children were conducted over four months in 2014.

We found that children's initial use of mobile media is heavily influenced by that of their parents and their parents' attitude towards mobile media in general which leads us to the recommendation that parents of young children aspire, as early as possible, to be sensitive to the age-related needs their children may have as they develop. Furthermore, parents should be reminded of their relevance as a role model to their children and how their own media use not only influences theirs, but the effect it has on the parent-child-relationship as well. It is only from this basis that we can further reflect on and promote digital literacy in more formal contexts such as kindergarten or preschool.

KEYWORDS

Mobile media, touchscreen devices, smartphones, tablets, preschool, children

SOMMARIO

Non sono solo gli adulti a trovare i media touchscreen intuitivi e semplici da usare, ma anche i bambini che non hanno competenze tecniche o di letto-scrittura o le possiedono in misura limitata. I bambini utilizzano i dispositivi *touchscreen* a un'età sempre più precoce come conseguenza dell'osservazione delle pratiche genitoriali oppure giocando con i cellulari dei loro genitori o utilizzando il tablet di famiglia per guardare i video.

Questo articolo presenta i risultati di uno studio qualitativo esplorativo sulla rilevanza dei media touchscreen nella vita di bambini tedeschi dai 2 ai 6 anni, sul loro accesso e utilizzo di questi dispositivi, sulle sfide e le preoccupazioni dei genitori nonché sulle strategie che adottano quando si confrontano con queste tematiche. Sono state realizzate delle interviste qualitative con 12 genitori e osservazioni partecipanti con i loro bambini nel corso di 4 mesi nel 2014.

È stato riscontrato che l'uso iniziale dei media mobili da parte dei bambini è fortemente influenzato da quello dei loro genitori e dall'atteggiamento che essi manifestano verso i media mobili in generale. Ne deriva la necessità di raccomandare ai genitori di prestare attenzione, il prima possibile, alle esigenze legate all'età dei loro figli nel corso del loro sviluppo. Inoltre, andrebbe ricordato ai genitori che svolgono un ruolo importante di modellamento nei confronti dei loro figli e che il modo in cui usano i dispositivi mobili non solo li influenza, ma ha anche effetti sulla relazione esistente fra genitori e figli. È solo a partire da queste premesse che risulta possibile dare adito a ulteriori riflessioni e promuovere la digital literacy in contesti più formali come la scuola dell'infanzia.

PAROLE CHIAVE

Mobile media, strumenti touchscreen, smartphone, tablet, prescuola, bambini

1 Introduction

Today, many children are born into, and grow up in, media-rich environments and are engaging with digital, internet-connected, mobile media at an increasingly young age (Holloway et al., 2013). However, when looking at the leisure activities of preschool children, it is fairly clear that digital mobile media are not playing a necessarily dominant role during their early years (Chaudron et al., 2015) and more time is actually spent on non-digital activities such as playing indoors and outdoors (both alone and with friends), reading books and watching television (Deutsches Institut für Vertrauen und Sicherheit im Internet, DIVSI, 2015; Medienpädagogischer Forschungsverbund Südwest, MPFS, 2015). So, while media may easily become an «everyday companion» (Deutsches Institut für Vertrauen und Sicherheit im Internet, DIVSI, 2015, p. 62) for young children, they cannot, by any means, be seen to be interfering with more traditional childhood leisure activities.

Even if very young children are not using them particularly intensely, touchscreen devices¹ often grant the very first access they have to digital (online) media by virtue of their ease of use and the requirement for technical (e.g. an ability to use a mouse and keyboard) and literacy skills being fairly low. In this light, then, it is clear that very young children are, to some degree, engaging with mobile touchscreen devices when they observe their parents using them, when they watch videos on a family tablet, or when they play a game on their parents' smartphone while on the road (Chaudron et al., 2015; Holloway et al., 2013). Mobile devices are commonly offered to children as a way to kill time, when say, waiting in a queue, and are often considered as a hi-tech «babysitter».

Although some studies on children's digital (mobile) media use are beginning to emerge, detailed data on the subject is still very limited. For example, there are gaps in our knowledge of when and why very young children start using mobile touchscreen devices, how they use them (e.g. which applications and functions), what kinds of problems they encounter (e.g. as a consequence of their limited competencies and skills) and how they cope with those problems, and what challenges parents perceive with regards to touchscreen media and their ways of dealing with them.

This article attempts to shed some light on these issues by presenting findings from an explorative study on the mobile media use of two- to six-year-old German children. Qualitative interviews with twelve parents and observations with their children were conducted over four months in 2014. Our analysis of the data focuses on toddlers' access to mobile touchscreen devices, their practices when using them, and the challenges parents perceive and anticipate as well as the

¹ In the following, the terms «digital mobile device» and «digital touch screen device» are used synonymously.

mediation strategies they adopt in guiding their children's use of these technologies. Against this background, we present some recommendations for parents and educators in our conclusion.

2 Research findings on young children and mobile devices

2.1 Access to touchscreen devices

Findings on the access preschool children have to mobile touchscreen devices and the way they use them vary (for an overview, see also e.g. Holloway et al., 2013): 23% of German households with children aged two to five years have a tablet; of these, 32% of children use the tablet with their parents and 15% alone (MPFS, 2015, p. 24); 9% aged two to five years use a smartphone and 7% use a tablet at least once a week (MPFS, 2015, p. 7). According to another German study, 7% of children aged three to eight years own their own smartphone and 1% own a tablet (DIVSI, 2015). Where children did not own their own devices, one-third (aged three to eight years) used their parents' smartphones, whereas only 8% used a family tablet (DIVSI, 2015).² Comparatively, in the United States 69% of families with children aged zero to eight years own a smartphone and 40% a tablet (Wartella et al., 2014). Of the children studied, only 1% had their own smartphone and 6% owned a tablet (ibidem). The same study reveals significant differences when comparisons are made regarding ownership and income: 63% of higher income families owned a tablet compared to 18% of lower-income families. The gap in relation to smartphones is less significant, but still, 81% of higher income families own a smartphone compared to 55% of lower income families.

In Sweden, 50% of children aged between three and four use a tablet and 25% a smartphone (Findahl, 2013). In Norway, 23% of children between zero and six years have access to touchscreen media and 32% have engaged with them by the age of three (Guðmundsdóttir & Hardersen, 2011). According to a French online study, only 25% of children between five and forty months have never used a touchscreen device (Cristia & Seidl, 2015). Although the percentage of non-users is higher for younger children, the authors state that the frequency of use does not increase exponentially with age.

2.2 Time and activities

There are still only scant data on the amount of time toddlers spend with mobile phones and tablets and *how* they use them (Cristia & Seidl, 2015; Palaiol-

² According to the same study, 7% of children aged three to eight years own a smartphone and 1% own a tablet. They usually receive their first mobile phone upon starting school as way of staying touch with their parents. The percentage of children with access to any kind of digital mobile device increased from 52% in 2011 to 75% in 2013 (ibidem). According to the same study, 38% of children under two years have already used a mobile device.

ogou, 2016; Rideout & Saphir, 2013; Wartella et al., 2014). Some studies have investigated the use of digital technologies by children under five years and consider computers/laptops, tablets and the internet in general terms (e.g. Palaiologou, 2016), but not, for example, the use of smartphones. Other studies only focus on selected activities, for example, playing games on smartphones, what may go some way to explain – besides the small percentage of preschool children who are using digital mobile media – the very low time of two minutes, on average per day spent on smartphones and tablets (MPFS, 2015, p. 10).³ In comparison, children in the United States in this age group spend eleven minutes with a smartphone and fifteen minutes with a tablet (*iPad*, *iPod Touch* or similar devices) per day (Wartella et al., 2014). These differences could be explained by the difference between the specific applications available on specific kinds of mobile device that can require varying amounts of time to get the most out of them, and as such, makes it difficult to find and assess precise and comparable findings on use-time.

While there are some studies on the online activities of children below the age of nine years that demonstrate how they are using digital media for a variety of activities including watching videos, playing games, searching for information, doing homework, and socializing with others (Holloway et al., 2013), data, particularly on the touchscreen activities of toddlers, are still few and far between. According to Rideout & Saphir (2013), children between zero and eight years spend, on average, eight minutes a day playing games on a mobile device, five minutes watching films or videos and two minutes using other applications (by way of comparison: fifty-seven minutes were spent watching television by the same age group). The percentage of children who use mobile devices on a daily basis increased from 8% in 2011 to 17% in 2013 (*ibid.*). For 63%, playing games is the most common mobile media activity, followed by the use of other apps (e.g. creative apps for drawing, making music or taking/editing photos).

An online survey of French parents with children aged between five and forty months found that their toddlers' touchscreen use was mostly spent looking at photographs (78%) or watching videos (68%). Markedly less children were found to use applications specifically designed for babies (50%) or puzzle games (25%) (Cristia & Seidl, 2015).

2.3 Parental mediation of mobile digital devices

Whether or not children are permitted to use digital mobile media, and what they use them for, is largely dependent on parental supervision and regulation. Digital technologies, and in particular those that are fundamentally mobile, while offering many practical opportunities to parents (e.g. bridging time, babysitter

³ In comparison to 2015, in 2014 children aged between six and twelve used a smartphone or mobile phone, on average, for fourteen minutes a day and a tablet for two minutes a day (MPFS, 2014, parent responses).

etc.) also demand engagement with a whole new learning process in the practice of discipline (Chaudron et al., 2015, p. 8). Parents employ sets of restrictive strategies to regulate device use that include rules on access, time, and content (e.g. by sanctioning only specific applications and only allowing offline use) while often being unaware that for very young children these rules can seem arbitrary, unclear and not make sense, owing, not least, to their limited cognitive abilities, and, it appears, the younger the children are, the more restrictive the rules (ibidem).

In the DIVSI study, nearly 80% of parents stated that their children are only allowed to play games that they themselves had pre-tested beforehand; two-thirds of parents lock devices with a PIN code and more than two-thirds also set rules (together with their children) for time limits on digital media use (DIVSI, 2015, p. 116). Whether or not rules are put in place is not only dependent on the age of the child but also on the level of their parents' education (ibidem, p. 117). Palaiologou (2016) has identified a greater degree of parental influence on children's digital media use when the children in question are three years old or younger.

2.4 *Potential risks of the use of mobile touch screen devices for preschool children*

As parents have a very strong influence on the applications preschool children are allowed to use on mobile devices and as children are using these devices mostly offline,⁴ the discussion is not primarily focused on typical content, contact or conduct risks (Livingstone & Haddon, 2009)⁵ but, rather, on incidental risks like unwanted in-app-purchases, incidental contact with age-inappropriate content (even when children are unable to understand it), as well as the longitudinal consequences of digital media on children's cognitive and neuropsychological development, however, longitudinal studies on these issues are noticeably absent from the literature.

Recent findings on the role of mobile devices and their impact on privacy and the child-parent-relationship have raised awareness of other kinds of «indirect» risks that emerge from parents' mobile media use. While for older children the discussion tends to focus on the question of mobile phones acting as a kind of «digital leash» or «umbilical cord» (Mascheroni & Cuman, 2014) the discourse on preschool children is dominated largely by discussions on the smartphone's impact on parental care as an important factor in children's mental and physical development.

⁴ In the German DIVSI-study (2015), 11% of three-year-old children, 22% aged five years and 55% of eight-year-old children use the internet (the device is not specified). According to the authors, internet use is related to reading and writing skills and also to peers' use, who make the internet seem more attractive (69).

⁵ In their review, Holloway et al. (2013) also consider different types of risks, young children might come into contact with, especially when using online applications.

3 Research context and questions

This study was part of a larger qualitative research project, funded by the German Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (Kühn & Lampert, 2015), which is also part of the Net Children Go Mobile project, which focused on children's mobile use between the ages of nine and sixteen (Mascheroni & Cuman, 2014). Noticing that mobile touchscreen devices are increasingly being used by younger children, we added a subsample of children between two and six. Our main research questions were:

- How relevant are mobile media for children of preschool age?
- How do children between two and six gain access to mobile digital devices?
- How do preschool children use mobile devices (which applications, in which situations, where and with whom?)
- What skills and competencies do children make use of when engaging with mobile devices?
- What are the attitudes of parents regarding the opportunities and risks of mobile media?
- How do parents handle the use of mobile media in everyday family life?
- How can parents mediate children's media use?

4 Methodology

To answer the research questions and with regard to the cognitive and verbal skills of toddlers, we conducted a mixed-methods study consisting of interviews with parents and participant observations of their children's mobile media use. Families were recruited via announcements, through kindergartens, and through personal contacts (using a snowball sampling method). All interviews and observations were recorded and the observations were guided by detailed protocols.⁶

To foster a sense of familiarity and to make sure that the children were as comfortable as possible, the interviews were conducted in the family home and the mobile devices used during the observation were those that belonged to their parents. In this way, the children were able to use a device (either a smartphone or a tablet) and applications that they were familiar with. If, under normal circumstances the child had only used mobile devices under parental supervision then the parents were asked to take part in the observation, otherwise the child was observed alone while the parents remained in another room in the house.

⁶ As video recording was not suitable due to data protection reasons, we documented important information in a systematic protocol, which considers the applications the child used during the session, his/her verbal and non-verbal reactions (for every application) as well as general comments on navigation skills and problems.

Depending on the child’s age we would set them particular tasks and ask them certain questions to gauge what level of independence they commanded over a mobile device. Questions included asking them the name of the device, who it belongs to and what they most liked to do with it, while the various tasks included asking them to lower the volume of the device and stopping the video if one was playing.

The observation and interviews were conducted between April and July 2014 and lasted between twenty and thirty minutes each. The children who took part were aged between two and six while the parents were aged between thirty-two and forty-three. Almost all of the parents who took part were married or in a relationship and many of them were university educated or worked in media, for example, in public relations, as journalists or as software developers (Table 1).

TABLE 1
Composition of the sample

Child’s Age	Children		Parents		Total (children + parents)
	Girls	Boys	Mothers	Fathers	
2 years	3	1	3	1	4 + 4
3 years	–	1	1	–	1 + 1
4 years	2	2	2	2	4 + 4
5 years	1	1	1	1	2 + 2
6 years	–	1	1	–	1 + 1
In total	6	6	8	4	12 + 12

For our analysis, detailed family descriptions were made while taking into consideration both the observation protocol and the answers given by the parents and their children.

The family descriptions were structured on the basis of the following categories:

- acquirement of a mobile device for both parents and their children (e.g. reasons, time)
- parental use and the role of mobile devices in everyday family life
- children’s ease of access (their own vs. parental devices)
- rules
- typical situations of use (children)
- applications used
- the skills children use when using mobile devices
- problems
- advantages from parents’ perspective
- strategies to avoid risks
- use of mobile media outside the family
- parental needs for support.

These consolidated descriptions laid the foundations for the cross-case analysis that followed.

5 Findings

5.1 Digital mobile equipment and access to mobile devices

The majority of participating families could be described as being technologically well equipped. All of them had mobile devices with touchscreens and almost all parents, both mother and father, had a smartphone with the exception of just two interviewees. With one exception, every family had a minimum of one tablet while there were six families in the sample who owned two. There were obvious differences in the length of time the families had owned a device; some early adopters had bought a tablet with the launch of the first *iPad* while others had bought their devices only a few weeks before the interview.

Tablets were normally used by all members of the family, although they played a bigger part in the lives of parents than their children. None of the tablets were purchased at the request of the children. If there was more than one tablet, one would generally be used by the parents for work while the other(s) would be used for family entertainment. Parents generally used a tablet to read and write emails, to take and view photos, and for entertainment (watching video, listening to music, playing games etc.). According to statements made by the parents we interviewed, mobile touchscreen devices had become a natural part of family life, what one participant described as a «constant companion» (Cristin).⁷

Most of the children had started to use the mobile devices from the age of two, but some had already engaged with them while they were still crawling, e.g. when looking at photos. They also showed interest in devices when they played sounds and (familiar) voices, their grandparents and other family members, for example.

Jan: «He had looked at photos, [...] he was perhaps seven or eight months or so». (Father of Lukas, four years)

In most cases, young children tended to use a tablet more than a smartphone, mainly because of its larger screen, however, most children had also used a smartphone. Permission to use a smartphone was also given in situations where a tablet was not available, for example, when on a long car journey.

According to the parent interviewees, their children often wanted to use mobile devices both when the devices were just lying around and when they were being used by their parents. In turn, parents told us that they often give them to their children to keep them occupied (e.g. in the case of bad weather), to bridge time (e.g. when traveling or in waiting situations) or as a source of gratification

⁷ All the names of participants have been changed in the interests of confidentiality.

(e.g. before going to bed). Some parents admit – often with a guilty conscience – that they sometimes use mobile media as a babysitter to have a quiet moment to themselves or to sleep longer.

Jan: «[...] when the two of them are awake in the morning, then you have so little time to use the bathroom and so on, the tablet is a real blessing in those situations (laughs)». (Father of a four-year-old boy)

In a kindergarten setting, none of the children in the sample had access to mobile media which was generally met with approval by most parents. Although they seemed to accept the idea of digital mobile media in children's early life, they consider the kindergarten a media-free zone.

They generally felt that it was unnecessary and too early in their children's lives to introduce digital media to an educational setting and that their children should be doing more constructive, or «meaningful» things with their time there (e.g. handicrafts or learning exercises).

Janna: «If they would do something useful with it, but from my point of view, she uses it enough here. There, they should play and skip and hop and jump». (Mother of a four-year-old girl)

Nonetheless, children are still coming into contact with mobile devices to varying degrees at kindergarten either as a consequence of the same range of reasons for engagement in the home described above, or when, maybe from time-to-time, an educator shows a video on their private device. In general, however, mobile digital devices are not being used for pedagogical purposes in a kindergarten setting (see also: Chaudron et al., 2015, p. 18).

5.2 *Children's preferred applications*

Often, the first applications young children engage with are photo and video apps. Parents enjoy, quite early on, showing pictures to their children on their mobile phones, and likewise, their children enjoy looking at and swiping between them. As they get older, children start getting permission to take their own photos on the device; one six-year-old boy in the sample had already learnt to send photos to his relatives by email.

Very young children also enjoy watching video on mobile phones, whether that is via streaming services like *YouTube* or standalone video apps. Some families even claimed that they no longer owned a television and that they only used a tablet for watching films.

Finally, preschool children like to play games on mobile devices (puzzle games in particular, and as they get older, more casual games such as *Angry Birds*). Some of the parents interviewed emphasized that they endeavor to choose games for their children that are both age-appropriate and pedagogical. During our observations of the children, however, it became clear that children with older siblings of-

ten wanted to play games that were too difficult for them while those with younger brothers or sisters chose games with a lower level of difficulty.

In the majority of cases children use mobile devices offline. Online applications tend to be used only from about five-years-old. For example, Leon (aged five) uses *Spotify* for streaming music and *Facetime* to speak with his father. Daniel (aged six), uses *Google Maps*, plays *Happy Farm* and writes emails, and Eva (aged five) shares a *MovieStarPlanet* account with her older brother (aged eight), although she is still too young to read the text in the application.

Jens: «We now have an account of — what is it called? — *MovieStarPlanet* or something, and actually F. and E. are still too young, because they cannot read yet, but anyway they really enjoy it». (Father of Eva, five years)

5.3 Handling of digital devices and skills

Under observation, all the children in the sample were able to quickly find «their» applications or «their» folder (where parents store the apps that they are allowed to use) on the mobile device quickly. Most of them were also able to switch on and unlock the device without any help (if their parents had given them the PIN-code beforehand). Some children aged two were already able to swipe on-screen menus. However, under observation, some of the younger children pressed quite hard on the touchscreen and activated the mode that allows the user to move the icons. It seemed that they expected a similar effect akin to that of pressing a physical button. In other situations the device did not react to the children's taps because they were tapping on something while the other hand was lying on the device at the same time. Older participants were already able to use more sophisticated applications that require more nuanced actions and skills, for example, the ability to zoom in and out of pages (for which two fingers are needed).

The most pertinent function of any mobile device for all the children who participated was the home-button which they used as a certain way to solve any problems they were having with the device, technical or otherwise, and return to the main menu. To shut down the tablet, they would either use the power button or they would fold down the cover which would place the device in stand-by mode.

It became clear that children with more experience of mobile devices and those that were allowed to discover them on their own were more skilled and independent when using them.

5.4 Conflicts, negative experiences, risks and concerns

According to parents, mobile devices do not only offer benefits but can also cause conflicts within the family. On the one hand, children seem to perceive the mobile devices as everyday objects that are often used in the home (mostly by their parents). On the other hand, they themselves are not allowed to use the

device whenever and for as long they would like, which leads to conflict, even with very young children:

Olaf: «Of course it is permanently available, so in situations when you're traveling somewhere, your child cries, it will work just like a tranquilizer and there is then also a disadvantage in that, because if you are traveling somewhere and they want it and you do not want to give it to them, then it's just difficult». (Father of Amanda, two years)

Similar conflict occurs between siblings, often when they both want to use the device at the same time. Another typical conflict that arises is when children delete photos or apps unintentionally to the annoyance of their parents. Often in situations like this, children do not understand what they have done wrong.

During the observation, a two-year-old girl almost incidentally bypassed the parental control for buying apps (Text: *Only for parents! Please press the star four times**) by accidentally tapping frequently on the asterisk button enough times, but in this case, her mother was able to stop her in time.

In general, negative experiences with mobile devices in our sample were few and far between, mainly because children at this age do not use mobile devices online. A few parents spoke about situations where their child saw a video or played a game, and had been bothered by it, although at first glance, the content did not seem to be problematic or inappropriate. One mother told a story about her three-year-old son who was scared by a video he watched in which a tractor that he was very fond of was tilted to the side. He was afraid that this could also happen in «his» reality, and furthermore, to people he knew who drove a tractor. This example shows that it is not only problematic or age inappropriate content that can upset very young children, but also content that they simply do not understand.

Even where children have had hardly any negative experiences, most parents are already aware that the use of digital media can be associated with risks. They are especially worried about the increasing amount of time children can and will spend with digital media, the social pressure to always have the latest device, the longitudinal consequences for privacy, increasing (unwanted) costs, and the potential for contact with inappropriate content (e.g. violence, sex). While most parents do not have a set idea of what the future might hold, some of them seem fairly confident that they will be able to prepare their children for the challenges they might face with digital media.

Kerstin: «[...] I do not let my child go in the street without telling her to look left and right. It is the same with online media». (Mother of Emma, two years)

5.5 Settings and rules

To mitigate risks, parents use different settings options on their mobile devices (e.g. PIN-code, blocking of in-app-purchases, disabling wireless internet

access). Some of them also create a folder for all of the apps their children are allowed to use. Only a few parents use a special app for child protection and their responses indicate that they are more familiar with the possibilities of age-classification than of content-classification.

Despite the technical options for protection available, some parents mentioned the importance of informing their children of the risks they might face when they are older and start to use online functions more autonomously.

Some parents have not thought about rules and the idea of mediation yet, either because their children still only rarely use mobile devices or because they have the impression that their children's media use is still under their control.

In general, however, the parental mediation we observed can be characterized as rather restrictive: All children must ask their parents before using the smartphone or the tablet (and some parents have to unlock it first). Rules are in place, particularly with regards to access and time spent on a device. The children we studied were allowed to use the devices between once a week and every day, mostly for a maximum of half an hour (only one five-year-old and one six-year-old boy were allowed to play in excess of thirty minutes for up to two hours). Rules on content seem to be less important for parents as all applications are chosen and downloaded by them.

6 Conclusion

The participating families' homes were well equipped with mobile digital media. Even if everyday life is not dominated by them, mobile digital devices are omnipresent and children come into contact with them at a very early age despite the exertion of substantial parental control. In all families, the parents bought the mobile devices for themselves and not for the children, but they also appreciate the possibilities the devices offer children in terms of learning and entertainment, especially when bridging time or being on the road. In all cases, it was the parents who granted access to the devices and decided which applications the children were allowed to use, in which situations, and for how long.

In contrast to other studies (see overview in Holloway et al., 2013), the toddlers in our sample had not yet used the online functions mobile devices offer: in most cases, children were looking at photos or watching videos on the screen before they moved on to games. The older the children, the more differentiated their repertoire of services and applications becomes, and as their literacy skills develop they start to use online applications. In our study, children started to use *Google Maps*, *Spotify*, *MovieStarPlanet* etc. at the age of five.

Consistent with other studies, however, the mediation strategies of the parents we interviewed can be characterized as quite restrictive (Chaudron et al., 2015). Although some parents stated that active mediation is important to them to improve media literacy their activities are mostly focused on limitations on time, access and unwanted cost by setting PIN-codes or passwords for the App

Store. On the one hand, this seems adequate in respect of their children's media use and cognitive skills at this age, but on the other hand, there is a necessity to advise parents that it is important to adjust their comprehension of mediation and to support and expand their children's media use as they get older.

Finally, the findings of our qualitative study are also in line with recent studies regarding the fact that children's use of digital technology is mainly affected by the way parents use and introduce the media to them, which in turn, is strongly related to their parents' attitude towards digital media in general (Chaudron et al., 2015; DIVSI, 2015; Findahl, 2013).

7 Limitations

In this study we aimed to explore the role of mobile digital media in the lives of preschool children and to gain more insights into what children at this age actually do with mobile devices. Although we tried to maximize the variety within the sample, it is biased with regards to the educational level of the parents that participated, which is fairly high.

Despite different recruitment and sampling strategies, we were not able to include families with a lower educational and/or socioeconomic status or migration background because we were unable to find families in this bracket who were willing to participate. Furthermore, some of the parents worked on or in media and, therefore, a positive attitude towards digital media permeated the sample. Both of these factors could go some way towards explaining the amount and types of media equipment in the homes of our sample (Wartella et al., 2014) as well as the moderate and almost completely offline use of mobile touchscreen devices compared to findings in other studies (e.g. reported in Holloway et al., 2013).

Another limitation could be seen in the fact that we specifically focused on mobile touchscreen devices rather than on online activities in general. Questions on the overall online experience and the role of mobile touchscreen devices would have been an informative addition, but were not considered due to time constraints.

8 Recommendations

The fact that touchscreen devices can be and already are used by very young children raises questions about children's media socialization, the challenges they face and their various needs for support (e.g. regarding digital literacy). Even if young children's media use has always been discussed critically, most studies on digital media do not refer to the media *use* of young children in question, but, rather, they emphasize age-appropriate concepts for digital literacy promotion, the development of empowering, age-appropriate services and con-

tent, and the use of digital technologies in early education (e.g. Chaudron et al., 2015; Khoo et al., 2015).

Although these recommendations are undeniably very important, it seems to be just as important to discuss the preconditions of healthy development and the impact parents' own media use has on their children and the parent-child-relationship.

Children at the age of two are at a very sensitive stage in their physical, cognitive and affective development. They have a special need for close, personal contact and parental attention to build stable relationships, and they have to – figuratively and literally – grasp the world with both hands to develop basic cognitive skills before they discover digital media. Growing up in a digital world, children perceive quite early on that mobile digital devices command a lot of their parents' (and other caregivers') attention which may only serve to make them more attractive. There are some hints that young children can become quite jealous of mobile devices, which — from a child's perspective — seem to absorb a lot of their parents' attention. Even if empirical studies are still lacking, it seems important to remind parents of children's perspectives and their general needs in terms of communication, proximity, and attention for their healthy development so that they may reflect on their own use of mobile media in the presence of their children. To these ends, the city of Frankfurt launched a campaign in 2015 with an appeal to parents to communicate more with their children,⁸ as both direct contact and attention as well as personal affection were seen as the most important factor in a child's development and for the parent-child-relationship.

Furthermore, as children's media use is decisively influenced by parents' general attitudes towards media and their own media use (e.g. Wartella et al., 2014), parents should be reminded of their relevance as a role model and to reflect on their media use in the presence of their children. For example, children understand that the use of mobile devices is not allowed in the kindergarten (or later in schools) so it is difficult for them to accept that rule if it is (permanently) undermined by their parents, for example when they pick up their children and wait inside the institution.

Until now, many recommendations on children and digital mobile media are still informed by the experiences of legacy media. But, as mobile media are, in some ways, completely different, e.g. regarding convergence, mobility, and modes of use, the need for findings on the longitudinal effects of easily accessible digital touchscreen media on children's social and social-cognitive development is compelling. It is only on this basis that further reflection on the promotion of digital literacy in more formal contexts like kindergarten or early age education (e.g. Khoo et al., 2015) can follow.

⁸ https://www.frankfurt.de/sixcms/detail.php?id=2855&_ffmpar%5B_id_inhalt%5D=28623379 [Retrieved on 10th June, 2016]

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