MASARYK UNIVERSITY

JOURNAL OF PSYCHOSOCIAL RESEARCH ON CYBERSPACE
CYBERPSYCHOLOGY

Nikken, P. (2017). Implications of low or high media use among parents for young children's media use. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 11*(3), article 1.
https://dx.doi.org/10.5817/CP2017-3-1

Implications of low or high media use among parents for young children's media use

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Abstract

Using an online questionnaire among 1,381 parents (children 0-7 years) in the Netherlands I investigated a) the congruence between the time that parents and children spend on various media; b) how several parent, child and household characteristics vary among four family types: low, moderate, high, and very high media consumers; and c) which characteristics most strongly differentiate these four family types. The analyses reveal that parents vary widely in their media consumption (from about 1 to more than 6½ hours media per day). Since the children's media use parallels their parent's, parents seem to provide an important example in the home. Data also show that lower and higher use families differ significantly on income, education level, number of devices at home, views on media for children, ease of applying co-active mediation and children's proficiency in media use. Finally, the four family types can best be distinguished on the basis of quantity characteristics (education level, number of screens at home, time spent by children on media) and quality characteristics (type of media content used, ease of mediation, views on media for children). Consequences for young children's development and parenting support are described.

Keywords: Family media use; parental mediation; socioeconomic status; media-literacy; reading

Introduction

Parental engagement in children's media use is an important factor for fostering beneficial outcomes of children's media use and controlling negative effects (e.g., Connell, Lauricella, & Wartella, 2015; Nikken & De Haan, 2015; Plowman, McPake, & Stephen, 2008; Rasmussen et al., 2016). Parental involvement in young children's media use, however, varies among families, depending on factors such as children's and parent's demographic characteristics, parental attitudes about the role of media for children, and the parent's and child's familiarity with the use of media devices and applications (e.g., Cingel & Krcmar, 2013; Nevski & Siibak, 2016a; Nikken, 2017). The extent to which parents use media themselves, has not received much attention in former parental mediation research, notwithstanding that parents are an important role model for their children, for example, cfr. the social learning theory (Bandura, 1976). As far as I know only recently Lauricella, Wartella, and Rideout (2015) investigated the complex interaction of the parent's media use and their attitudes about technology at home and the young child's use of these electronic media. In order to get more insight in how the parent's consumption of electronic and print media functions as a determinant for young children's familiarization with these media, this study looks at the role of the parent's media use in three ways. First, by testing the congruence between parent's and children's time spent on different forms of electronic and print media in families where parents are low, moderate, high and very high users of media. Next, by testing how several household, parent and child characteristics vary in an absolute sense for these four families; and third, by exploring the typical relative characteristics of these four family types.

Theoretical Background

As of 2001 the American Academy of Pediatrics (AAP) primarily advised that children younger than 2 years should not use media at all and older children should limit their media use to 2 hours per day – the 2x2 rule (AAP, 2011). Although the AAP recently loosened its media guidelines – recognizing that even infants and toddlers cannot be excluded from electronic screens anymore (Radesky & Christakis, 2016) – it is still deemed important that young children have no access to media in their bedrooms, that media should not be used as a pacifier, that children under 2 years should not use media on their own, that children under 5 years should limit their media consumption to 1 hour per day, and that young children's media activities are balanced with enough non-media activities. In practice, however, many families do not keep up with the AAP guidelines. For example, Palaiologou (2016) reported that in England, Luxemburg, Greece and Malta about 80 to 90 percent of the 3 to 5 year-olds regularly watch television programs or play games alone. Another 34 to 62 percent uses the computer, tablet or smartphone on his or her own, and 23 to 45 percent visit the internet alone. Moreover, according to European and US studies, children younger than 2 years old on average already spend about 1 hour per day on electronic screens (Holloway, Green, & Livingstone, 2013), whereas children aged 2 to 5 years spend between 2 and 3 hours per day on media (Ofcom, 2016; Palaiologou, 2016; Rideout, 2013). Since these are average figures, some young children may spend even much more time on media.

In order to get more insight in the variation in young children's media consumption it is important to look at the family environment, because that is one of the most important pedagogical contexts for how children learn to value the role of media (Piotrowski, 2017). Regarding that context, over the years much knowledge has been acquired on the parent's role for children's media use. Parental guidance, herein, consists of various practices by which parents intentionally mold and regulate their children's use of the media or as Warren (2001, p. 212) stated 'any strategy parents use to control, supervise or interpret media content for children'. According to the theory of parental mediation (Nikken, 2017) these deliberate strategies can be divided into restrictive mediation, active mediation, co-use, supervision, monitoring, and the use of technical restrictions (see, e.g., Livingstone & Helsper, 2008; Nikken & Jansz, 2006, 2014; Valkenburg, Krcmar, Peeters, & Marseille, 1999; Zaman, Nouwen, Vanattenhoven, de Frerre, & Van Looy, 2016). Thinking of Bandura's (1976) social cognitive theory, however, which postulates that children 'learn' from and imitate relevant role models, parental mediation also may entail unintentional behaviors that may affect children too. That is, without being aware of it, parents can also exemplify a role model for their children by means of the take up and location of certain media devices at home and creating the child's media-ecology, or by their own media attitudes and preferences and their own media consumption (Ito et al., 2010; Plowman et al., 2008). Lauricella and colleagues (2015) indeed noted that the parent's own use of different media devices predicted the time that their children aged 0 to 8 years spend on screen media, in particular television and computers, and to a smaller extent smartphones and tablets. Thus, based on the role model theory, I expect that the extent to which parents use media at home and the extent to which their young children use various media devices, as well as print media, will be directly related to each other (H_1).

Next, when the parent's and children's media use within a given family are related, it is conceivable that variables which play a role for young children's engagement with electronic screens and media content also will be associated with the parent's media consumption. According to Comstock and Scharrer (2012) there are three principle variables that determine media use. First, the context of the environment in which media are accessible and can be used by members of the family is defined by household characteristics, such as the number of screens available at home and in the child's room, but also by the presence of siblings, and the marital and socioeconomic status of the family. Next, personal attributes affect how media are perceived by the family members. Among parents these attributes relate to gender, and to the understanding of media and technology (i.e., their media proficiency) and views about the role of media for children. Among children personal attributes also relate to demographics as gender, age and mental ability, which together result in the child's media proficiency. Situational factors, finally, according to Comstock and Scharrer (2012), include transient but sometimes repetitive factors as states of mind – such as anger, loneliness and joy – or clock- and calendar-based influences such as day of the week or seasonal weather influences.

In this study I look at the role of household, parent and child characteristics, for which there is ample evidence that these principal variables do influence young children's media use, but could also affect their parent's use.

Regarding education and income we indeed know that the daily use of electronic media – in particular television – is higher among adults low in education or income than among higher educated or more wealthy adults (e.g., Stamatakis, Hillsdon, Mishra, Hamer, & Marmot, 2009; Teychenne, Ball, & Salmon, 2012). Also, children in lower educated, low income families have more devices in their bedrooms (e.g., Cingel & Krcmar, 2013; Gentile & Walsh, 2002; Rideout & Hamel, 2006). Therefore, there will be more devices at home and in the child's bedroom in families where parents and children make more use of media (H_{2a}) and high use families will rather consist of lower educated or lower income families than higher educated, high income families (H_{2b}). Next, in single parent families young children make more use of media, both educational and non-educational (Cingel & Krcmar, 2013; Vandewater et al., 2007), but this could also be related to the parent's media use. Single parents experience more stress in parenting (McLoyd, 1998), are usually less involved in their children's media use (Warren, 2005) and are less restrictive on their children's media time and content choices (Gentile, Nathanson, Rasmussen, Reimer, & Walsh, 2012). Thus, single parents may not only more often allow their children to own and use media devices, but to use media more often to entertain themselves, therefore comprising higher use families (H_{2c}). Then, older children consume more media than younger children (e.g., Anand & Krosnick, 2005; Lauricella et al., 2015), but the sooner young children start using media as part of their daily routine at home, the more media – television in particular – they will consume when they get older (Cingel & Krcmar, 2013). Since, the presence of siblings makes the daily use of entertainment (non-educational) media among preschool-aged children more likely (Cingel & Krcmar, 2013), this could mean that parents in these bigger families allow a higher media use by their siblings in line with a higher use of media by themselves. Thus, families with more children at home will be higher media use families (H_{2d}).

As already touched upon above, the parent's ideas about the advantages and risks of media content and technologies may determine how much and what media children can consume (Lauricella et al., 2015). Several studies have indeed indicated relationships with parents mediation strategies (e.g., Nevski & Siibak, 2016a, 2016b; Nikken & Schols, 2015; Vaala, 2014). In families where parents are critical about media, children's media use often is limited and restricted (e.g., Cingel & Krcmar, 2013; Nikken & Jansz, 2014; Valkenburg et al., 1999). Thus, parents will be more negative about media in lower use families (H_{2e}) and more easily apply restrictive mediation on their children's media use (H_{2f}). Livingstone, Mascheroni, Dreier, Chaudron, and Lagae (2015) observed, on the other hand, that parents who are very apt consumers of media technologies themselves are less restrictive of their children's media use, because then they should restrict their own media use too. In similar vein Haines at al. (2015) noted that parents who think positively about the media both for their children's enjoyment or for the parent's own personal gains, often have children who have more access to media in their bedrooms and consequently are higher users of media. It is, thus, conceivable that parents with an optimistic view on media come from higher use families (H_{2g}). Such parents, who are positive about modern media and technology, also are more apt to share these media with their children (Lauricella et al., 2015). Therefore, parents in higher use families also should feel more competent in applying co-use or active mediation on the child's media use (H_{2h}). Moreover, when parents have more experience with, for example, computers and gaming, they are less afraid of technology and more proficient in using media themselves (Appel, 2012), which may increase the probability that parents will share media with their children or stimulate them to use media on their own. Therefore, finally, in higher use families parents can be expected to be more media proficient than in low use families (H_{2i}).

With regard to child factors that are typical in children's media consumption, some could be the result of the family environment, viz. the parent's media consumption. For example, children who favor to watch educational or informative programming, read print media, or use computers and the internet when using media more often have higher educated or higher income parents – who tend to be lower users of media in general (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001; Calvert, Rideout, Woolard, Barr, & Strouse, 2005). Children in lower socioeconomic situated families rather choose to watch entertainment television and play video games, whereas their parents may have lower expectations of the educational value of the media for their children as compared to parents in higher socioeconomic situated families (Cingel & Krcmar, 2013; Gentile & Walsh, 2002; Rideout & Hamel, 2006). This means that in higher use families children will favor electronic entertainment media (H_{2j}) and will be less engaged in 'serious' educational media content and in print media (H_{2k}).

Finally, children who, regardless of age, are more skilled or proficient in media use tend to spend more time on several media platforms and also own more devices in their bedroom than children who are less media skilled (Nikken & Schols, 2015). Moreover, parents also find it easier to apply all kinds of mediation, including co-use

and active mediation, to media skilled children than to children who are less proficient in media use (Nikken & De Haan, 2015; Nikken & Schols, 2015). Therefore, it seems logic that these parents are more interested in media and, like their children, also are more apt to use media for themselves. Therefore, finally, I expect that children in higher use families are more proficient in media use than children in lower use families (H_{2l}).

Method

Participants

Commissioned by *Mediawijzer.net* a national platform for media-literacy in the Netherlands, in the spring of 2016 an email request to participate in an online survey was presented to about 5,000 parents who had at least one child aged 0 to 7 years old living at home. The parents were drawn from the *EUpanel*, which consists of more than 40,000 voluntary members and which is claimed to be representative of the Dutch adult population (www.directresearch.nl/methoden-voor-marktonderzoek). In all, 1,451 parents reacted positively (29% response) and were presented the questionnaire. Each respondent received an incentive (1 *Euro*) for participating in the survey. After inspection of the data the records of 70 parents were deleted, because they had indicated that their child does not use any media at all or because data were missing on questions relevant for this study. These respondents did not differ from the other parents with respect to their educational level, income, gender or other relevant characteristics. The deleted parents, however, had primarily infants or toddlers living at home. Perhaps therefore, they felt that questions about their mediation practices or children's media use were not applicable to their situation. The final sample (N = 1,381) contained twice as many mothers as fathers, whereas 9% had indicated to be a single parent (see Table 1). The age of the children was equally spread: each age category was represented by 14% to 16% of the parents, except for children 0 years old (5%). Parents also reported evenly about boys and girls (50%). As compared to the general Dutch population (Centraal Bureau voor de Statistiek [CBS], 2015), our sample was skewed upwards regarding educational level; only 11% of the parents had a 'very low' educational level (no education/only primary education) and 34% had a 'low' level (vocational secondary education), however, 38% had a 'high' educational level (university preparatory education, Bachelor's degree) and 17% even had a 'very high' level (university education/Master's degree). Somewhat more than 25% of the parents had an annual family income up to 40,000 *Euro* [i.e., below or around the Dutch modal income of 36,500 *Euro* (Centraal Planbureau, 2016)]; 54% had an annual family income between 40,000 and 67,000 *Euro* per year; and almost 21% of the parents had a family income of more than 67,000 *Euro* per year. In terms of family size, the parents were rather similar to the general Dutch population with an average of two children at home.

Procedure

In the online questionnaire, one of the parents was asked to answer all questions, keeping in mind a child within the age range of 0 to 7 years living at home. Answering all questions took on average about 15 minutes.

Measures

Access to media at home. For 14 types of electronic media (e.g., television, tablet, cellphone, e-reader, internet connected toys) the parents indicated (a) how many of these were regularly used and present at home with scores varying from 0 (none at home) to 4 (four or more), and (b) whether these devices were accessible in the child's bedroom too or not. The number of devices at home was then calculated as the sum of all devices. Following Nikken and Schols (2015), the number of devices in the child's bedroom was calculated as the sum of four types of electronic media devices: television sets, touchscreens, game devices, and computers (see below for the classification procedure).

Time spent on media by parents and children. The amount of time parents spend on different media was measured by asking the parents how many hours and or minutes on a regular day they would spend in their leisure time on each of the 14 electronic devices at home (see above) and on three forms of print media. Similarly, parents also indicated how long their child would use these media on a regular day. If a medium was not available at home or not used the time was set as 0 minutes for that parent or child. Following Nikken and Schols (2015) and Nikken and De Haan (2015), media use was categorized for distinct types: (1) television (DVD-

players, and regular and smart television sets), (2) touchscreens (smartphones, tablets, children's tablets), (3) game devices (handheld game players, controller operated game consoles) and (4) computers (personal computers, laptops, children's laptops). Next to these electronic media, also (5) print media (newspapers, magazines, (children's) books) were distinguished. Miscellaneous media such as regular cellphones, e-readers, and internet connected toys and devices, were excluded, since children did not use these media at all and parents did not use them very often too. For both parents and children, for each of the five medium types, the time spent was calculated as the sum of the times spent on the media forms defining that type. Because some parents and children had very high average scores for some types of media, outliers were recalculated to a maximum of 3 times the SD (cf., Kline, 2011).

Table 1. *Descriptives for Household, Parent and Child Characteristics (N=1,381).*

	Range	Mean	SD	Reliability
Household characteristics				
# screens at home	(0-56)	8.76	3.78	
Screens in child's bedroom	(0-4)	0.17	0.55	
Educational level	(1-4)	2.6	0.9	
Income level	(1-3)	1.95	0.68	
Marital status (1=single)	(0-1)	0.09	0.28	
# children at home	(1-3)	2	0.73	
Parent characteristics				
Gender (1=male)	(0-1)	0.38	0.49	
Time spend on media	(0-540)	272.3	163.3	
Positive media effects view	(1-5)	3.65	0.48	r = .30***
Media as a pacifier view	(1-5)	3.21	0.57	r = .28***
Negative media content effects view	(1-5)	2.61	0.54	r = .15***
Media rejection view	(1-5)	3.7	0.55	r = .29***
Ease of co-active mediation	(1-5)	3.68	0.31	α = .72
Ease of restrictive mediation	(1-5)	3.76	0.34	α = .63
Media proficiency	(1-5)	4.39	0.61	α = .95
Child characteristics				
Gender (1=male)	(0-1)	0.51	0.5	
Age	(0-6)	3.67	1.83	
Time spend on media	(0-376)	155.3	96.9	
Use of video content	(0-1)	0.78	0.41	
Use of contact media	(0-1)	0.26	0.35	r = .30***
Use of educational media	(0-1)	0.41	0.35	α = .75
Use of offline print	(0-1)	0.36	0.33	r = .19***
Motoric media proficiency	(1-5)	2.64	0.63	α = .70
Cognitive media proficiency	(1-5)	3.36	0.64	α = .69

Children's engagement with media content. Parents indicated whether their children did or did not use media for 20 different media activities, regardless of which device. In order to find distinct types of media content use a principal component analysis with Oblimin rotation (Delta = 0) was used. After deleting four items, because they did not fit in an initial analysis (making digital photos or movies, reading e-book stories, making music on a device, looking for online information), an acceptable solution with six factors was found which explained 60.5 percent of the variance. The items that had a unique loading higher than .40 on a factor defined six distinct types of media content: (1) participative educational content (5 items, e.g., drawing/coloring games, memory games, puzzles); (2) contact media (2 items, contact via Skype/Facetime, calling others on the phone); (3) watching video content (1 item, watching programs or clips for fun, for example on YouTube); (4) using offline print (2 items, reading story books, reading comics); (5) playing action content (3 items about violent, action and

adventure game play); and (6) using social media content (3 items about Social Networking sites or platforms). Because the last two types of content were hardly used by the children, they were not used in this study.

Parental views about media for children. Parents indicated on a 5-point scale whether they agreed or disagreed with statements about media and children. Based on Nikken and Schols (2015) these statements related to four views: (1) positive media effects (2 items: Media are good for my child's cognitive development, Media will be good for my child's school performances); (2) media function as a pacifier (2 items: Digital media give a moment of rest for my child, Media are a good to keep my child quiet); (3) negative media effects (2 items: My child may be confronted with rude language in the media, My child may be frightened by inappropriate media content); and (4) media rejection (2 items: I'd rather see my child play with other things than digital media; digital media are not as good as normal toys for my child).

Parental mediation competence. Parents indicated how they felt about 18 parental mediation activities, that related to the three main strategies discerned in mediation literature: restrictive mediation, active mediation and co-use (e.g., Nikken & Jansz, 2014, Valkenburg et al. 1999). Answering options varied on a 5-point scale from 'very difficult' to 'very easy'. Principal component analysis with Oblimin rotation (Delta = 0) indicated two distinct types of mediation competences, after deleting one item with a double loading on both factors. Based on this solution, which explained 29.4 percent of the variance, two scales were constructed by averaging the item scores that had a unique factor loading of .30 or higher: (1) ease of co-active mediation (10 items, e.g., 'Helping your child when he/she wants to play a new game', 'Making time to play a game together with your child', 'Planning a specific moment each day to read together', 'Deliberately using media together for watching clips or programs when the child asks for it') and (2) ease of restrictive mediation (7 items, e.g., 'Making rules about the tablet use of your child', 'Turning the television set off when the child should stop watching', 'Preventing nagging behavior after seeing advertisements', 'Being consequent with your partner about your child's media use').

Proficiency in media use. For 16 types of handling electronic media devices, the parents indicated on a 5-point scale ranging from 'very difficult' to 'very easy' to what extent they had confidence in their own media use, for example, 'Creating an account on social media', 'Installing an anti-virus application', 'Blocking unwanted websites or pop-ups', 'Setting parental controls on game consoles or other devices'). Principal component analysis indicated that all items loaded on one factor. Therefore, one scale was constructed by averaging all items.

Based on Nikken and Schols (2015) and Nikken and De Haan (2015), the child's skills in using digital media were measured with 16 statements about how children can handle a device or an application. Answering options varied on a 5-point scale from 'Not applicable at all' for my child to 'Fully applicable'. A principal component analysis indicated, after excluding four items, that parents perceived two types of capacities: (1) proficiency primarily based on motoric skills, e.g., 'Can control an application with the mouse or keyboard', 'Can write his/her own name on the screen', 'Knows how to steer an avatar on the screen', and (2) proficiency rather based on cognitive reasoning or understanding how media function, e.g., 'Can find his/her way in a digital environment by means of symbols on the screen', 'Can grasp the existence of advertisement on the internet', 'Can follow audio instructions when playing a game', 'Can find and select his/her favorite websites or apps on the computer, tablet or smartphone'. Based on the factor solution, which explained 40.5 percent of the variation, two scales were computed by averaging the item scores that loaded on each factor: motoric proficiency (6 items) and cognitive proficiency (6 items).

Results

Comparison of Children's and Parent's Media Use

Based on the amount of time parents spend on all media together on an average day, four percentile groups were created: low use families (parents spending 165 minutes or less, N = 343), moderate use families (165 to 270 minutes, N = 342), high use families (270 to 397 minutes, N = 359) and very high use families (more than 397 minutes, N = 348). In accordance with Hypothesis 1, children's media use parallels the media use of the parents in these four family types: children's mean media time per day is respectively 127 minutes (low use families), 130 minutes (moderate), 160 minutes (high) and 204 minutes (very high). Moreover, within the families the child's media use is also congruent with their parent's use. For all media together Pearson's r = .30, p < .001, and for

each type of device Pearson's r = .22 (touchscreens); .25 (television); .22 (computers); .18 (game devices); and .23 (print media), $p < .001$.

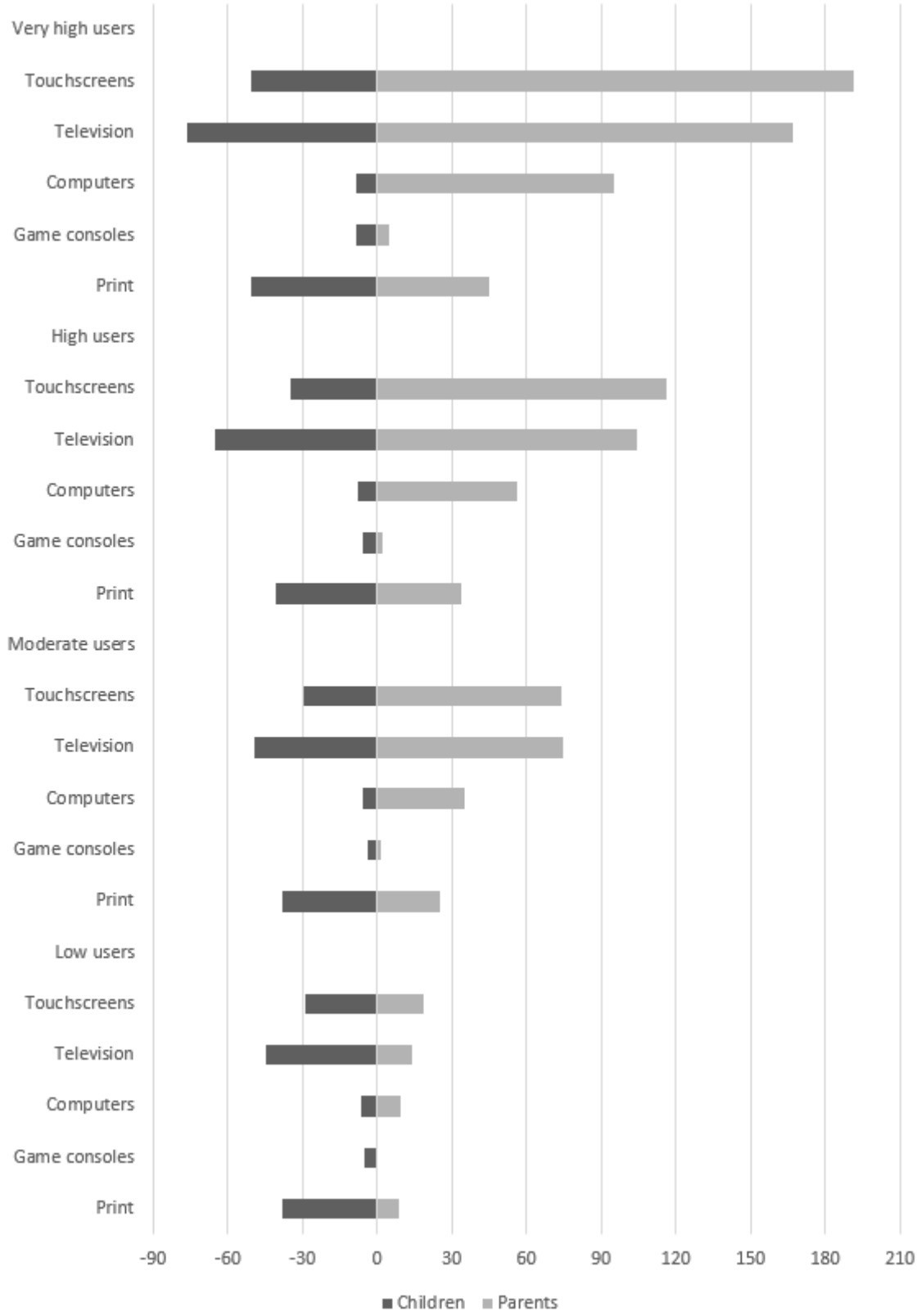

Figure 1. Average time (minutes/day) devoted to electronic and print media by children and parents in families with parents as low, moderate, high or very high users of media.

As Figure 1 shows, the congruence between the parent's and child's media use does not mean that parents in all families spend more time on all media types than their children do. Touchscreens, television, and computers, usually are used more by the parents. The absolute differences between parents' and children's use of these devices are the largest in very high use families and smaller in high use and moderate use families, Student's t varying from 7.92 (moderate users of touchscreens, df = 341) to 32.47 (very high users of touchscreens, df = 347),

$p < .001$. In low use families another pattern appears. In these families parents spend less time on touchscreens and television as compared to their children, t is respectively -3.59 and -10.18, $p < .001$ ($df = 342$). Also, in all family types parents spend significantly less time on game devices than their children do, t varying from -3.41 ($df = 347$) to -5.48 ($df = 342$), $p < .001$. Finally, children on average also spend more time on print media than their parents do in low, moderate and high use families, t varying from -3.08 ($df = 342$) to -14.36 ($df = 342$), $p < .001$.

Absolute Differences for Background Characteristics between Lower and Higher Media Use Families

Table 2 presents the absolute differences between low, moderate, high and very high media use families regarding household (H_{2a-d}), parent (H_{2e-i}) and child characteristics (H_{2j-l}). Differences between the four family types were tested by means of a GLM Multivariate analysis. Among household characteristics, accessibility to media devices is a significant determinant. In accordance with H_{2a}, higher use families have significantly more screens available at home and also in the young child's bedroom than low and moderate use families. In very high use families, 1 in 7 children own at least one media device. Furthermore, as H_{2b} predicted, high and very high use families are significantly lower educated as compared to moderate and low use families, and very high use families have a significantly lower annual income than high, moderate and low use families. Contrary to our expectations, however, the parent's media use in single parent families is not different from that in intact families (H_{2c}) or different in families with more or less children at home (H_{2d}).

Table 2. *Mean Scores For Household, Parent and Child Characteristics in Low, Moderate, High and Very High Media Use Families.*

	Low	Moderate	High	Very high	*F*(3,1377)
Household characteristics					
# screens at home	8.3[a]	8.4[a]	8.9[ab]	9.4[b]	8.65***
Screens in child's bedroom	.12[a]	.18[ab]	.13[ab]	.24[b]	4.05**
Educational level	2.70[a]	2.80[a]	2.54[b]	2.38[b]	16.57***
Income level	1.99[a]	2.07[a]	1.98[a]	1.78[b]	12.82***
Marital status	0.07	0.08	0.1	0.09	ns
# children at home	2.1	2	2	2	ns
Parent characteristics					
Gender (1=male)	0.37	0.4	0.38	0.37	ns
Positive media effects view	3.54[a]	3.69[b]	3.67[b]	3.68[b]	9.06***
Media as a pacifier view	3.17	3.21	3.22	3.25	ns
Negative media effects view	2.66	2.63	2.59	2.58	ns
Media rejection view	3.78[a]	3.67[b]	3.68[b]	3.66[b]	3.89**
Ease of co-active mediation	3.64[a]	3.68[b]	3.70[b]	3.69[b]	3.53*
Ease of restrictive mediation	3.73	3.79	3.78	3.75	ns
Media proficiency	4.32	4.39	4.39	4.44	ns
Child characteristics					
Gender (1=male)	0.57	0.46	0.5	0.51	ns
Age	3.3	3.5	3.4	3.3	ns
Use of video content	.71[a]	.79[b]	.82[b]	.80[b]	6.24***
Use of contact media	0.23	0.28	0.26	0.28	ns
Use of educational content	.33[a]	.40[ab]	.46[b]	.46[b]	11.88***
Use of offline print	.32[a]	.36[a]	.42[b]	.35[a]	6.35***
Motoric media proficiency	2.6	2.64	2.65	2.68	ns
Cognitive media proficiency	3.23[a]	3.36[b]	3.44[b]	3.43[b]	8.47***

Note: a-c Row values with different superscripts are significantly different from each other; *$p < 0.050$; **$p < 0.010$; ***$p < 0.001$.

Considering parent characteristics, low use families differ significantly from the other families. As expected, in higher use families parents significantly less strongly reject media (H_{2e}) and are significantly more convinced of positive media effects on children's learning (H_{2g}). In accordance with H2h, higher use parents also reported somewhat more ease in applying co-active mediation on their children's media use as compared to low use families. Parents do not differ, however, in their views on negative media behavioral effects (H_{2e}) or on screens as a pacifier (H_{2g}). Moreover, there are also no differences between families regarding the ease of restrictive mediation (H_{2f}) or the parent's own media proficiency (H2i). Furthermore, parents in the four family types do not differ with regard to their gender.

Finally, for child characteristics, children's engagement with specific media content is associated with the extent that their parents consume media, but not in accordance with all hypotheses. In low use families children indeed significantly less often choose to passively watch video content for fun as compared to children in other families (H2j), but children do not differ in their engagement with contact media. Contrary to our expectations, interactive educational content is less often chosen in low use families as compared to children in high and very high use families (H_{2k}). Also, engagement with print media occurs the most by children in high use families, and significantly less by children in low, moderate, and very high use families, thus partly justifying H_{2k}. Finally, as expected, children in moderate, high and very high use families are more proficient in media use than are children from low use families, although this only holds true for cognitive skills (H_{2l}). There are no significant differences in the motoric media skills of children from lower or higher use families, nor are there differences with regard to children's age and gender.

Relative Differences between Lower and Higher Media Use Families

So far, associations with the extent of parent's media use were analyzed separately for the means of household, parent and child characteristics. In order to get a more concise picture of the relative differences between the four family types (RQ1), canonical discriminant analysis was performed. In this analysis, we used the characteristics related to a) the household (# screens at home and screens in the child's bedroom, educational level, family income level, marital status, and number of siblings), b) the parent (4 views about media for children, ease of co-active and restrictive mediation, and media proficiency), and c) the child (time spent on 4 screen devices and print media, engagement in 4 types of content, and 2 types of media proficiency) as discriminant variables. The four types of families were used as the grouping variable. The objective of the analysis was to find the linear combinations of the predictor variables that best discriminated between the four types of families in this study. Children's engagement in educational content, and their cognitive and motoric proficiency were all three significantly interrelated (Pearson's r = varied from .42 to .63), which may have had some spurious influence on the outcomes. However, all other relationships between all predictor variables were below the common threshold of .30 (Brown & Wicker, 2000). Therefore, engagement in educational content and both types of proficiency were not excluded from the analysis.

Three discriminant functions resulted from the analysis (see Table 3). The canonical correlation of the first and second function was respectively .38 (Wilk's $\lambda = .80$; $\chi2 = 302.37$, $df = 72$, $p < .001$) and .21 (Wilk's $\lambda = .93$; $\chi2 = 94.03$, $df = 46$, $p < .001$). The canonical correlation of the third function was rather low .14 (Wilk's $\lambda = .98$; $\chi2 = 29.21$, $df = 22$, ns) and will therefore not be used.

The first discriminant function is primarily defined by three household characteristics (the presence of media devices at home and, negatively, the parent's educational level and income) and the child's time spent with television, touchscreens, print media, and to a lesser extent game consoles. This function thus represents the dimension of lower educated and less wealthy families with more media devices at home, combined with how long children use almost all forms of media. The second function is defined by several parent characteristics (views on positive media effects and the ease to apply restrictive mediation, and to a lesser extent to also apply co-active mediation). In addition, the second function is defined by child characteristics relating to which media content children engage in and their cognitive proficiency in using these media. This second function thus stands for families where parents are more positively oriented towards the media and easily apply mediation, whereas their children are more cognitively skilled in playing educational games, watching video content and reading print.

Table 3. *Canonical Discriminant Analysis; Structure Matrix among Parents as Low, Moderate, High or Very High Users of Media.*

	Function I	Function II	Function III
Household characteristics			
# screens at home	**0.33**	0.03	0.01
Screens at child's room	0.16	-0.03	0.4
Educational level	**-0.43**	0.05	0.31
Income level	**-0.35**	0.25	-0.02
Marital status	0.08	0.07	-0.07
# children at home	-0.13	-0.09	0.05
Parent characteristics			
Positive media effects view	0.14	**0.42**	0.45
Media as pacifier view	0.11	0.11	0.13
Negative media effects view	-0.13	-0.12	-0.01
Media rejection view	-0.13	-0.25	-0.26
Ease of co-active mediation	0.13	0.27	0.04
Ease of restrictive mediation	-0.01	**0.32**	0.19
Media proficiency	0.14	0.13	0.22
Child characteristics			
Television time	**0.57**	0.24	-0.03
Tablet time	**0.52**	-0.12	0.19
Computer time	0.16	0.02	-0.19
Game time	0.27	-0.13	-0.1
Reading time	**0.33**	-0.12	0.15
Use of video content	0.14	**0.41**	0.14
Use of contact media	0.06	0.11	0.3
Use of educational content	0.3	**0.45**	0.08
Use of print	0.06	**0.48**	-0.25
Cognitive media proficiency	0.22	**0.41**	0.08
Motoric media proficiency	0.1	0.1	0.12
Eigenvalue	0.16	0.05	0.02
% variance explained	70.1	20.7	9.2

Note: Bold figures indicate the primary significant loading on the first and second function.

The relative distinction between the four family types is represented in Figure 2. Low use families are rather high educated with a higher income, have less media devices at home, have less cognitively media proficient children who are not making much use of the media, whereas their parents are reserved in their views about the media for their children. Moderate use parents, like low use parents, also are higher educated and more wealthy, have less devices at home, and have children who do not use the media so much. In these families, however, children are more engaged in print media and educational and video content, even though they are not yet very cognitively proficient media users. Their parents are positively oriented towards media for children and relatively confident about their mediation practices. High use parents, as compared to low and moderate use parents, are middle educated and have a middle income, possess more devices at home, and have children who make more use of media to watch video content for fun, play educational games and read stories. These children are the most cognitive proficient users of media. As compared to moderate user families, the parents are even more confident about their restrictive and co-active mediation and have a very positive view on media for their children. Very high use families, finally, are the lowest in education and annual income, yet possess the most devices at home and have children who spend the most time on these devices although they are not very proficient users. The parents in these families also experience more difficulties in applying restrictive and co-active mediation and do not have very positive views about the educational outcomes of media for their children.

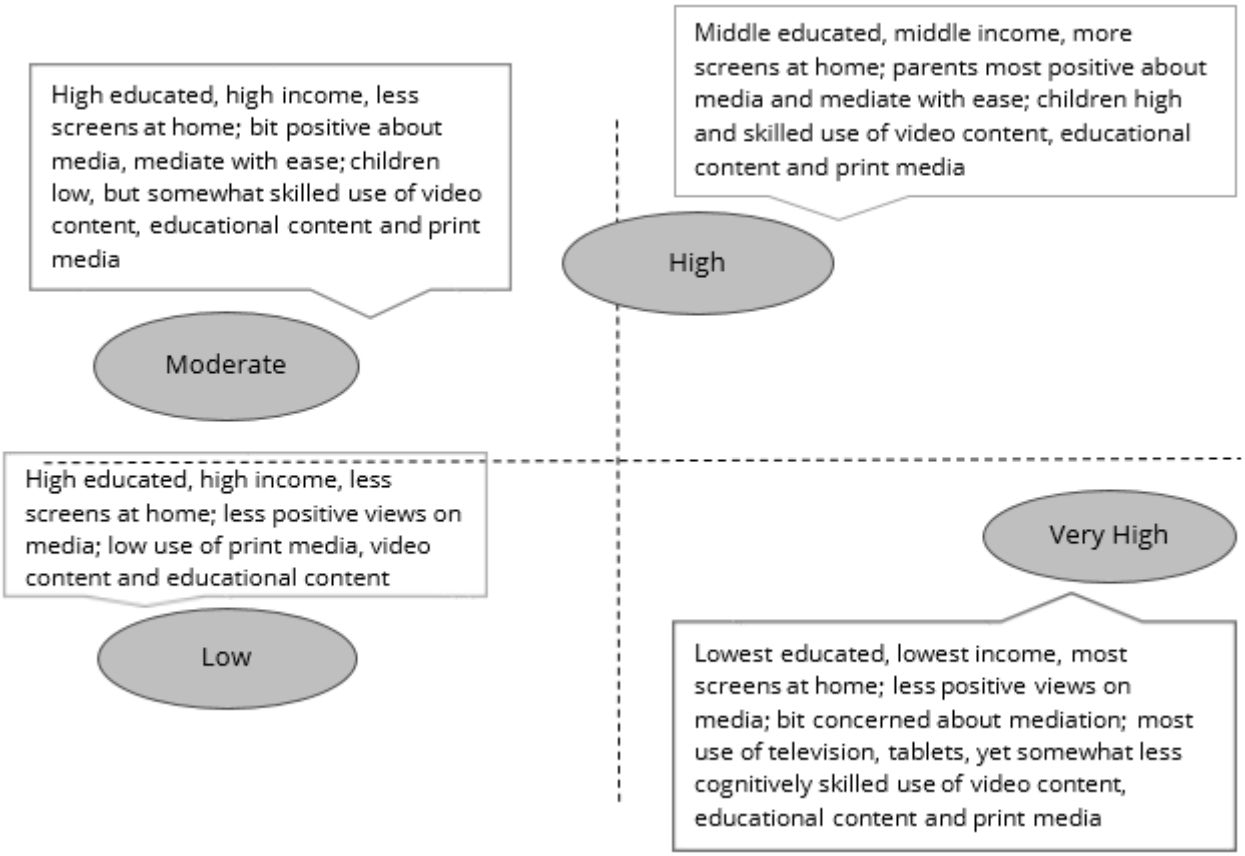

Figure 2. Positions of four family types of media users (light, moderate, heavy and very heavy) on two discriminant functions. NB: Centroid coordinates of the four family types on the two functions are respectively: -0.36; -0.29 (low users); -0.36; 0.13 (moderate users); 0.08; 0.27 (high users); 0.63; -0.13 (very high users).

Discussion

Parents provide an important role model for their children, first, with their own media habits and preferences, and, secondly, by acquiring certain devices and technologies in the home environment. Therefore, this study aimed to shed light on how parents' own media use affects young children's (0-7 years) familiarization with electronic and print media at home in three ways; first, by testing the congruence between parent's and children's time spent on different forms of electronic and print media in low, moderate, high and very high use families; secondly, by testing how household, parent and child characteristics vary in an absolute sense for these families; and third, by exploring the typical relative characteristics of these four family types. Insight in the variation in young children's media use at home is important, because early experiences with the media are fundamental for the child's development of tastes, cultures, and future media habits.

Several interesting findings emerged. Firstly, the results indicate that the parent's consumption of media can vary immensely. On one side of the spectrum, a quarter of young children grow up in families where parents spend less than 1 hour per day on print and screen media, whereas on the other end another quarter of the parents reported to spend up to 6 and a half hours on an average day on various media in their leisure time. Moreover, as expected, the parent's media use seems to function as an important predictor of children's media consumption. Not only was the total time spent on media by children and by parents at home congruent, the children's and parent's use of individual devices also was significantly correlated. This indicates that the parent's use of specific devices, both in time and in acquiring and placing these devices in the home environment, may familiarize children already at a very young age with these technologies (cf., Ito et al., 2010).

Especially, children who are raised in very high use families are of concern. These young children, according to their parents, on average spend more than 3 hours per day on media, of which more than 2 hours on watching television and using tablets. This amount of electronic media use well exceeds the new AAP standard of 1 hour screen time per day (Radesky & Christakis, 2016). Although the type of media content children engage in is important as well, meaning that non-digital leisure time is not a priori good as compared to screen time, high media use in young children may be associated with more risks, such as overweight, concentration problems, ADHD, low school performance etc. (Pagani, Fitzpatrick, Barnett, & Dubow, 2010). Moreover, when media habits already are imprinted so early, these children also are at risk to become very high users of media when they get older (Cingel & Krcmar, 2013). Considering that their parents are avid users of media too, it seems not very likely that these families will easily cut back on the young child's electronic media use, at least not without an incentive from external parenting support.

In low use families a completely different situation appears as compared to (very) high use families. First, these children spend relatively much of their media consumption on reading print, which is deemed beneficial for their development. Moreover, the parents in these families may provide many examples of non-media related activities during the day, which also may provide a positive example. More research, however, is needed, because children in low use families on average still spend almost the same amount of time on media as children in moderate use families, and more time on media than their low use parents do. Maybe, the parents' low use of media may be the result of being occupied with work or other chores, resulting in a more lenient attitude towards their children's use of media than their own.

It was surmised that parents in bigger families as compared to families with fewer siblings, consume more media because they may be more lenient about media for their children, and for themselves. However, the parent's own media use was not related to the number of siblings at home, even though the family constellation may affect the child's media consumption (e.g. Cingel & Krcmar, 2013; Comstock & Scharrer, 2012). With regard to the marital household status, also no differences appeared between the four types of media users, i.e., single parents and married parents were evenly distributed among lower and higher use families. Former studies had indicated that single parents are less restrictive on their children's media use (Gentile et al., 2012) and probably therefore have children who are higher users of media as compared to children in intact families (Cingel & Krcmar, 2013; Vandewater et al., 2007). Maybe, marital status and number of siblings are not strongly related to the parent's own media consumption when children are still rather young, as compared to when children get older and more demanding.

Other interesting findings also related to household, parent and child characteristics. For these variables, some small but significant absolute differences were found between the four family types mostly in accordance with the hypotheses. These differences, moreover, make sense, since possibly confounding variables, such as the child's age and gender or the parent's gender, in the data set did not differ significantly per family type. First, high and very high user families tend to be lower educated and less wealthy, but are equipped with more screens at home and in the child's bedroom. In 14 percent of the very high use families children from 0 to 7 years have at least one electronic screen in their bedroom, which may explain the high use of electronic media by these children. Next, as expected, in very high use families children also less often are engaged in reading, which corresponds to the lower amount of time spent on reading as compared to electronic media by these children. Finally, in low use families children are the least engaged in consuming video content for fun, as expected, but also less often interact with educational content as compared to children in the other family types. The latter finding contradicts former studies (e.g., Cingel & Krcmar, 2013; Rideout & Hamel, 2006) which indicated that low use families favor 'serious' educational content over entertainment media. The low use of educational content, however, may be the result of a lower total time spent on all media devices, reducing the chance to use educational games and applications as well.

Also, as expected, the extent to which families make use of media devices is associated with the child's proficiency to handle these media, at least in a cognitive sense. When parents make less use of media the children have a lower understanding in how to operate the media and which pitfalls may exist. It is too early to conclude that the parent's media consumption functions as a direct example for young children's use of media and with that an increase in understanding how to manage media content. The results do, however, indicate that a child's capacity to understand how the media function is an important factor already at a very young age

and, next to the child's own media experience, also related to the extent that their parents use media. Moreover, low use parents also are somewhat less confident in scaffolding their children's media use by applying co-active mediation. This warrants for further study into the relationship between the parent's own experience with digital media content, his or her proficiency in media use and his or her capacities to mediate the young child's media consumption. When parents themselves have too little experience with digital media, it may become more difficult for them to support their child with the latest technology.

Finally, it was found that next to cognitive media proficiency, motoric media proficiency can be distinguished as a skill young children need when using new technologies. The existence of this separate capacity is underpinned by the finding that a child's motoric proficiency in using media devices does not differ with the amount of media use in the family. Perhaps this motoric capacity is not primarily related to a child's media experience, but rather to biological factors which are generally the same in children in lower and higher use families. Moreover, both the motoric and cognitive oriented capacities could be analogue to two media skills mentioned by Plowman, Stevenson, Stephen, and McPake (2012): *operational skills and understanding technology's role for everyday life*. With Plowman et al. (2012) I conclude that more fundamental research is needed into the role of technology for young children's development.

Practical Implications

The role of the parents at home is essential, since they are very important role models for young children's learning (Bandura, 1976). Parents may intentionally guide their children's media use, but may also act in specific ways or exude opinions about media, without being aware of them, and as such unintentionally affect their young children's development. Practitioners working with and for parents, therefore, can benefit from insights in how media are used in the home environment.

The results of this study show that young children are raised in very different media environments, varying from low to very high media use ecologies. Moreover, how children are familiarized with media in these home-ecologies depends both on the quantity of media confrontations (access to screens at home and length of daily media use, impacted by the family's socioeconomic status) and the quality of that media use (the child's engagement and proficiency in handling video, print and educational content, and the parent's confidence in co-active mediation and views on media for children). Low use families and moderate use families are relatively equal in a quantitative sense and both distinct from (very) high use families. Yet, they differ significantly from each other in terms of quality, with more confident parents and more proficient children in moderate use families than in low use families. This finding corroborates results by Lauricella et al. (2015) who noted that children make more use of media in low use families when parents are positive about media for their children, as compared to parents with a negative stance. Practitioners in parenting support should be aware of the fact that in low use families children consume more media than their parents do and may assist parents to get more grip on that situation, for example, by raising awareness about the educational value of media for young children.

With an even bigger pallet of different media screens at home and more examples of media use by their parents, children in high use families, in a relative sense, are the most proficient media users and most engaged in watching video for fun, interacting with educational content and reading print. The greater experience with media among high use, and also somewhat among moderate, parents seems to help these parents be more confident in their mediation and deliberately choose specific educational content and a balanced diet of reading, watching and surfing for their children. Possibly these high use and moderate parents have less fear for technology and are more apt to use the media (Appel, 2012) and in accordance with a positive attitude share these media with their children (Lauricella et al., 2015). Yet, an 'overdose' of media possibilities at home as encountered in very high use families, however, is paralleled by a significantly lower quality of media familiarization for the child. In these families, parents are less convinced of the positive effects of media, tend to be the least involved and have children who more often own and use devices by themselves. Perhaps these families could be characterized as individualized families, at least regarding their media consumption.

For practitioners who support parents on concerns or questions about raising children with media at home it is thus good to know that parents can vary extremely in how they perceive the role of media for their children and

in how parents are a role model for their children by means of their own media habits. Advise aimed at families to curb young children's media consumption such as by the AAP (Radesky & Christakis, 2016) should therefore take account of the parent's media use, and underlying factors, as well. As appeared from this study, in all families young children between 0 and 7 years on average spend more time on electronic screens than the 1 hour advised by the AAP. Among low use families parents may give their children an ideal example by spending less time on media than their children do, but in all other families parents spend considerably more time on electronic media and less time on print media than their children do. The AAP, and similar organizations who support parents on media, therefore, could consider to broaden its advise more directly on the parent's own media use as well, taking note of differences in the use of television, computers, touchscreens, game consoles and print media by the parents and their children. Also, advise for parents about children and media could focus more on the dichotomy that differentiates families: the quantity of media use and the quality. The AAP guidelines, and the like in other countries, could give more attention to the parent's attitudes about media for children, and to the importance of which and how many devices are where located in the home. Focusing on how much media children should use as compared to other activities during the day and discouraging technology from the child's bedroom is important, but parents could be addressed more specifically on the quality of their mediation practices and the types of media content that their children are engaged in too.

Limitations

A limitation of the sample is that some parents with mainly infants or toddlers were excluded because of incomplete data and lower educated parents were underrepresented. The results should be interpreted with this drawback in mind. Another important limitation is that our questionnaire is based on parent self-reports. Therefore, the amount of time that parents and children spend on media may not be fully accurate. However, we assume that the parent reports do provide a reliable relative indication of the family's media consumption. Moreover, the other scales we used, mostly did have sufficient internal validity. Therefore, we feel confident that our data provide an interesting starting point for further research on the role of the parents' own media consumption as an unintentional additional factor in the socialization of young children's media use, next to the intentional parental mediation strategies.

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Editorial record: First submission received on April 23, 2017. Revisions received on June 29, 2017 and July 19, 2017. Accepted for publication on July 20, 2017.
The article is part of the Special Issue "Young children's use of digital media and parental mediation" guest edited by Bieke Zaman and Charles Mifsud.

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