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A parental perspective on apps for young children☆

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ABSTRACT

Touchscreen applications (apps) for young children have seen increasingly high rates of growth with more than a hundred thousand now available apps. As with other media, parents play a key role in young children's app selection and use. However, to date, we know very little about how parents select apps for their children. Guided by uses and gratification theory, a survey was conducted with 600 Dutch parents who had at least one child between three and seven years old. Across two studies, we identified parents' most important needs that drive their selection of children's apps as well as the extent to which these needs differ by parenting style. Results indicate five overarching parental needs when it comes to children's apps, and confirm that these needs vary by parenting style. Findings offer important insight into how parents select apps for their children.

Touchscreen technology is taking up an increasingly important role in modern family life. Not only is the number of tablets (portable touchscreen computers) growing every year, but the prevalence of children below the age of seven using these media is also rising substantially. For example, in the US, research indicates that 75% of children under the age of eight are using mobile devices – and this number continues to rise (Rideout, 2013). These figures are similar in other western countries (Mediawijzer, 2014). Given these increasingly high rates of access and use, it is not surprising that touchscreen applications (apps) for this young audience have seen similarly high rates of growth with more than a hundred thousand apps now available for young children (Godfrey & Reed, 2013). And while the overall amount of children's apps has grown rapidly, apps targeting early childhood dominate the market. In fact, comparing 2009 to 2011, apps for toddlers and preschoolers saw the greatest growth (an increase of 23%). Indeed, with 58% of (top 100-selling) apps targeting this age group, today's app market seems to be focusing squarely on early childhood (Shuler, Levine & Ree, 2012).

During children's early years, parents play a key role in children's app selection and use (Rideout & Hamel, 2006; Wright et al., 2001). Often referred to as media gatekeepers, parents influence children's media use by setting an example of media habits, by co-viewing with their children, by discussing their values and attitudes about media, and by regulating or encouraging use of particular types of content (Austin, 1993; Padilla-Walker & Coyne, 2011; St Peters, Fitch, Huston, Wright, & Eakins, 1991). Presently, there is a wealth of literature highlighting the powerful role of parents in children's traditional media habits (Rideout & Hamel, 2006), but studies focusing on touchscreen media are scarce. Still, it seems reasonable to argue that parents are just as influential in shaping young children's access and use of touchscreen media (i.e., apps).

Considering that parents play an influential role in young children's media selection and use, it is valuable to understand what parents are looking for in children's media. Research on traditional media has shown that parents indeed have specific needs that precede their encouragement of children's media use. Rideout and Hamel (2006), for example, have shown that parents want media content that is educational or that can occupy their children in order to have uninterrupted time to complete household tasks. Likewise, parents may also have certain needs that drive their selection of particular apps for their children. Until now, there is no research on what parents want in apps for their children (*parental needs*). The first aim of this research is to address this gap by identifying parents' most important needs in apps for young children.

As one might expect, parental needs are not universal. For instance, while some parents may find the educational value of apps to be crucial when selecting apps for their children, other parents may place greater emphasis on the entertainment value of

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apps. These differences in needs can likely be explained, in part, by a host of individual differences. Indeed, research has shown that certain individual characteristics can influence parents' needs for choosing media for their children (Nikken & Jansz, 2013; Valcke, Bonte, De Wever, & Rots, 2010). One of the most important overarching parental characteristics to consider is *parenting style*. Defined as the many specific activities that influence child behaviors (Darling & Steinberg, 1993), parenting style has been shown to influence how parents approach and manage their children's media – and is typically a robust predictor of children's media use (Eastin, Greenberg, & Hofschire, 2006; Padilla-Walker & Coyne, 2011; Rosen, Cheever, & Carrier, 2008). Since it is likely that parents' needs are associated with parenting style, the second aim of this research is to investigate how parental needs for young children's apps may differ by parenting style.

To address both aims of this research, two complementary studies were conducted using survey data from a sample of Dutch parents with children aged 3 to 7. In study 1, we explore the range of needs that parents might have when it comes to apps for their children and investigate which of these needs are most important for parents. After identifying these needs, in study 2, we evaluate how parenting style is associated with these needs.

1. Study 1: identifying parental needs in apps for children

In order to understand why parents select particular apps for their children, we focus on needs that drive parents to select these apps. In previous research with traditional media, researchers have found that parents are often looking for content that can provide entertainment and educational benefits to their children, serve as babysitter or bedtime coping method, support family bonding time, provide background noise, or encourage physical activity (He, Irwin, Sangster Bouck, Tucker, & Pollett, 2005; Zimmerman, Christakis, & Meltzoff, 2007). It is unclear, however, if the needs parents express for traditional media are the same for apps. It is possible that the digital affordances of apps meet alternative parental needs when it comes to selecting content for their children.

1.1. Parental needs

To best understand parents' needs when it comes to selecting apps for their children, it is useful to build on theory that can explain the process of media selection. Uses and gratifications (U&G) theory is considered one of the most regarded theoretical paradigms to explain this process. U&G is an audience-centered approach, which posits that individuals have particular needs that drive their media use (Katz, Blumler, & Gurevitch, 1973; Rubin, 2009). Thus far, research suggests that people choose new media technologies as well as traditional media to gratify at least five general needs (Sundar & Limperos, 2013). These are the need for: (1) entertainment, (2) information seeking, (3) social interaction, (4) emotional satisfaction, and (5) passing time.

In addition to these general needs, Sundar and Limperos (2013) have argued that there are additional nuanced needs which are more specific to the unique affordances of each medium (medium-specific needs). For example, Leung and Wei (2000) suggested that the mobile phone is not only used to gratify the need for information and social interaction (general needs), but has also at least two components not generally associated with traditional media: mobility (no need to look for or queue up for public phone) and immediate access (regardless of time, location and availability). Similarly, people are not only motivated to use apps to fulfill their general needs for social interaction, entertainment, and emotional satisfaction, but also needs more specific to the affordances of the medium (referred to as "app-specific needs") such as immediate access, mobility, and socializing (Lin, Fang, & Hsu, 2014). As a result of these varying medium-specific needs, it is typical for empirical work to apply a U&G perspective to each new medium that emerges. Indeed, U&G theory has been used to explain individual needs in new media platforms such as mobile phones, video games, the Internet, YouTube, and Facebook (Ebersole, 2000; Haridakis & Hanson, 2009; Joinson, 2008; Kaye & Johnson, 2002; Leung & Wei, 2000; Papacharissi & Rubin, 2000; Sherry, Lucas, & Greenberg, 2006; Stafford, Stafford, & Schkade, 2004).

When it comes to young children's media, the application of U&G becomes more complex. Specifically, in the case of young children's media use, the "media selector" (the parent) is the focal point of interest, instead of the actual user of the medium (the child). Adding to this complexity, existing literature suggests that parents have both *parent-centered* and *child-centered* needs (O'Connor, Chen, del Rio Rodriguez, & Hughes, 2014; Stipek, Milburn, Clements, & Daniels, 1992) that influence parents' media selection. Parent-centered needs typically focus on outcomes in favor of the parent. This suggests that parents, in their role of media gatekeeper, are able to articulate both their own and their child's needs when it comes to young children's media content and that these needs, together, are crucial in the selection of media content. For example, a mother may want an app that occupies her child so she has time for other things. In addition, parents may also have parent-centered needs that benefit their child. For example, a mother may want her child to learn something or to have fun when using an app. Here, instead of the mother wanting time for herself, she wants something positive for her child. Both cases reflect parent-centered needs. Child-centered needs, however, reflect needs of the child as perceived by the parent. For example, a mother may know that her child enjoys being rewarded in gameplay or enjoys playing independently, and therefore looks for apps that offer fulfillment of these needs.

Although most applications of U&G do not make a distinction between needs of different parties involved, in this particular situation where the user (the child) differs from the selector (the parent), this distinction is a logical one. Importantly, most of the earlier mentioned general needs for using media can be reasonably translated to discrete parent-centered and child-centered needs. For example, a parent can indicate the need for "entertainment" as a parent-centered need ("I want my child to have fun when using an app") as well as a child-centered need ("My child wants to have fun when using an app"). In this study, in order to obtain a comprehensive view of parental needs, both parent-centered and child-centered needs are investigated. In particular, we ask:

RQ1a. What are the most important parental needs when it comes to apps for 3-7 year-olds?

RQ1b. To what extent are parental needs in children's apps parent- and child-centered?

1.2. Study 1 method

1.2.1. Procedure and participants

After receiving ethical approval from the University of Amsterdam, a large research institute in the Netherlands (GfK) collected the data. Parents were recruited through GfK's existing online panel (approx. 50,000 Dutch households). They were compensated €1.50 ($1.71) for their participation. In sampling, parents that had at least one or more children aged 3–12 were selected for potential inclusion (approximate n = 10,000). A total of 3000 of those parents were randomly invited to fill in an online survey. Among those who were invited, 1320 matched the inclusion criteria for this research (i.e., had a tablet used by at least one of their children aged 3–7).

With a response rate of 45%, 600 parents completed the survey. Nine parents were removed due to erroneous data.

In all, a total of 591 parents were included in the analyses (M_{age} = 38.7 years, SD_{age} = 5.63). Among these parents, 41.6% were fathers and 58.4% mothers. On average, parents appeared to be slightly older than nationally representative estimates would suggest (CBS, 2014). More than half of all parents in the sample had a high level of education (55.7%; bachelor's degree or higher). In the sample, 17.1% of the parents had one child, 54.3% had two children, and 28.6% had three or more children. In the survey, parents answered questions with one of their children in mind (randomly selected within the survey). Of these selected children (M_{age} = 5.40 years, SD_{age} = 1.34), 50.3% were boys.

1.2.2. Measures

The main focus of Study 1 is to understand the needs that drive parents to select specific apps for their children. Since there are no existing scales that measure parental needs for young children's apps, following the tradition of U&G research, we developed this measure using qualitative in-depth interviews. The interviews (n = 20) revealed a broad scope of needs that, after analysis, were translated into a discrete set of items for use in the parent survey (n = 591).

1.2.2.1. Parental needs measure development. Prior to conducting the survey, a broad scope of needs were identified through in-depth interviews with a convenience sample of 20 Dutch parents (17 mothers and 3 fathers) using an interview-technique known as laddering. The majority of their children (M_{age} = 4.1 years, SD_{age} = 2.13) were female (59.1%).

Laddering interviews are generally used to understand choice criteria (Reynolds & Gutman, 1988) and have recently also been adopted in U&G research (Pai & Arnott, 2012). This technique includes probing "why" questions that take the parent "up the ladder" from concrete attributes (in this case children's apps) to more abstract needs that drive their preferences. In the interview, each parent was asked which apps they had previously selected for their child and which app-features they identified as important for a children's app. App-features are specific characteristics of the app that affect the app's design, content or technology. Thereafter, for every app-feature, the parent was asked to explain *why* this particular app-feature was important for them (parent-centered need) or for their child (child-centered need). This laddering technique is a common way to determine an individual's underlying needs that drive their choices. In particular, asking parents why specific app-features are important helped ensure that the identified parental needs are the ones that parents most value for their children.

1.2.2.2. Parental needs measure. Working with the information collected in the in-depth interviews, a total of 31 parental needs were identified - of which 11 were parent-centered needs (see Table 1) and 20 child-centered needs (see Table 2). These needs were then translated into 31 discrete items for measurement in the survey.

Parent-centered needs were measured by asking the extent to

Table 1
Descriptives of parent-centered needs.

Parent-centered needs items	*M* (*SD*)	% (very) important
I want my child to have fun when using an app.	4.33 (0.61)	96.4%
I want my child to understand the purpose of an app.	4.13 (0.67)	90.0%
I want my child to be able to use an app independently.	4.09 (0.70)	87.3%
I want to be able to set my own parental preferences in an app.	4.08 (0.84)	80.0%
I want my child to learn from an app.	4.02 (0.75)	79.7%
I want my child to be active when using an app.	4.01 (0.63)	86.8%
I want an app that stimulates my child's fantasy.	3.92 (0.69)	78.7%
I want an app where my child learns to think about others.	3.48 (0.80)	50.1%
I want my child to relax when using an app.	3.28 (0.82)	39.1%
I want to interact with my child when using an app.	3.25 (0.81)	38.4%
I want my child to be occupied with an app, so I have time for other things.	2.80 (0.92)	23.0%

Note. Mean is based on a scale from 1 (not at all important) to 5 (very important). Percentages indicate % of parents that found the need important (4) or very important (5).

Table 2
Descriptives of child-centered needs.

Child-centered needs items	*M* (*SD*)	% (very) important
My child wants to have fun using an app.	4.37 (0.62)	95.3%
My child wants to use an app independently.	4.21 (0.70)	89.5%
My child needs to understand the purpose of an app.	4.08 (0.75)	86.0%
My child wants and app that triggers his/her curiosity.	4.01 (0.70)	83.1%
My child needs to see results of things he does in an app.	3.89 (0.76)	76.5%
In an app, my child wants to see things he/she is specifically interested in.	3.85 (0.75)	75.8%
My child needs to recognize things in an app.	3.80 (0.72)	72.1%
My child wants an app that teaches him/her new things.	3.74 (0.79)	69.0%
In an app, my child is looking for variety.	3.71 (0.82)	67.0%
My child needs to be rewarded in an app.	3.63 (0.88)	61.4%
My child is looking for a challenge in an app.	3.60 (0.77)	60.1%
My child wants to be surprised when using an app.	3.59 (0.75)	60.7%
In an app, my child wants to make progress fast.	3.55 (0.85)	58.2%
My child wants an app where he/she can imitate real life.	3.34 (0.92)	48.9%
My child wants to identify with the characters in an app.	3.23 (0.88)	39.8%
In an app, my child wants to repeat actions over and over again.	3.21 (0.80)	38.6%
What happens in an app has to be predictable to my child.	3.10 (0.81)	32.0%
My child wants support during the use of an app.	2.98 (0.84)	27.7%
My child wants to interact with me when using an app.	2.81 (0.84)	21.0%
My child wants to relax when using an app.	2.69 (0.94)	18.8%

Note. Mean is based on a scale from 1 (not at all important) to 5 (very important). Percentages indicate % of parents that found the need important (4) or very important (5).

which the parent found the following statements important in apps for their child. Parent-centered statements were, for example, "I want my child to learn something in an app" and "I want my child to use an app independently". Answer categories ranged from 1 (not at all important) to 5 (very important). To measure *child-centered needs*, parents were asked to what extent they believe their child attaches importance to the statements. Child-centered statements were for example: "My child wants to be rewarded in an app" and "My child wants an app that triggers his/her curiosity". Answer categories ranged from 1 (not at all important) to 5 (very important). To support the validity of this measurement approach, the formulation of these statements was based on earlier research on needs (Ebersole, 2000; Haridakis & Hanson, 2009; Joinson, 2008; Kaye & Johnson, 2002; Leung & Wei, 2000; Papacharissi & Rubin, 2000; Sherry et al., 2006; Stafford et al., 2004).

1.3. Study 1 results

1.3.1. Parents' most important needs (RQ1a)

RQ1a asks which parental needs are most important to parents when they select apps for their children. To best answer this question, the first step was to determine whether the 31 individual parental needs items reflect broader sub-categories of needs. Upon examining the data, it was determined that traditional exploratory factor analytic approaches (i.e., Kaiser rule) were inappropriate due to the item-level skewness. Therefore, an alternative approach that is less sensitive to such skewness – namely, parallel analysis – was employed to determine the number of factors underlying the data. Parallel analysis has been found to be a more robust approach to identifying stable factors and has shown to be appropriate for non-normally distributed ordinal variables (Basto & Pereira, 2012). Items with factor loadings lower than 0.40 were omitted as well as cross-loading items (items that have a factor loading of 0.40 or higher on one or more factors). In all, a total of six items were removed.

Results of the parallel analysis indicated that the remaining 25 items represent five broad needs (see Table 3). Answering RQ1a, the most important type of need for parents is the need for "independent entertainment" (Factor 1, $M = 4.20$, $SD = 0.47$, $\alpha = 0.86$). More than 80% of parents indicated that this need – which represents a need for their child to have fun, to understand the app, and be able to use it independently – was "important" or "very important" when selecting an app for their child. The second most important need, which we refer to as "co-education" (Factor 2, $M = 3.71$, $SD = 0.55$, $\alpha = 0.70$), reflects parents' need to have their children learn from an app, but at the same time, having the ability to control or co-use the app with their children. Compared to independent entertainment, this need was expressed less frequently with approximately 40% parents indicating that this need is "important" or "very important" when selecting an app for their child.

Following independent entertainment and co-education, results show that approximately 25% of parents indicate that apps which offer their children a "tailored challenge" – in other words, apps which tailor content through progression as well as apps which challenge their children via rewards and varietal content – are "important" or "very important" when it comes to apps for their child (Factor 4, $M = 3.62$, $SD = 0.50$, $\alpha = 0.82$). This need was followed by a need for "familiarity" (Factor 3, $M = 3.37$, $SD = 0.55$, $\alpha = 0.69$) with approximately 20% of parents citing this as "important" or "very important" when selecting apps. This need focuses on their children's desire to recognize and predict app content, as well as their children's desire to perform familiar and repeated actions. Finally, occurring the least frequently, results indicated that approximately 10% of parents find it (very) important that an app is able to "pass time" (Factor 5, $M = 2.92$, $SD = 0.66$, $\alpha = 0.63$). This reflects both a need for apps to calm children down as well as apps that can occupy children so that parents can complete other tasks.

1.3.2. Parent-centered or child-centered needs (RQ1b)

RQ1b asks to what extent parents' needs are parent-centered or child-centered. Upon reviewing the five needs that emerged in response to RQ1a, it is clear that these needs reflect either parent-centered or child-centered needs. In terms of parent-centered needs, both "co-education" (Factor 2) and "pass time" (Factor 5) reflect parent-centered needs. For example, with the need for co-education, parents indicated that they want their child to learn from an app and that they want to be able to set their own preferences in an app for their child. Similarly, regarding the need to pass time, parents indicated that they want their child to be occupied with an app, so they have time for other things. On the contrary, results indicate that the need for "familiarity" (Factor 3) and "tailored challenge" (Factor 4) represent child-centered needs. For instance, the items reflecting familiarity state that the child wants recognizable content in an app or predictable actions. Similarly, when it comes to tailored challenges, parents indicate that their child wants to make progress and be surprised in an app.

Interestingly, parents' most important need – the need for "independent entertainment" (Factor 1), consists of both parent-centered and child-centered items. Parents indicate that they find it important that an app encourages their child's autonomy, but at the same time, they note that their child wants to use an app independently. Similarly, parents find it important to understand the purpose of an app, but also indicate that they perceive their child to find this equally important.

1.4. Study 1 discussion

Guided by a U&G perspective, this study revealed five overarching needs that are important for parents when selecting apps for their young children: the need for independent entertainment, co-education, a tailored challenge, familiarity, and pass time. As expected, these needs reflect a combination of both parent-centered (e.g., attaching importance to apps that pass time) and child-centered (e.g., attaching importance to familiar content in apps). Moreover, as expected, the needs reflect needs that previous U&G work would consider "general" needs as well as needs that are more specific to the affordances of the medium.

One of the main aims of Study 1 was to identify the most important needs that parents have when it comes to apps for their children. By far, results indicate that parents attach the greatest importance to apps that are *entertaining* as well as self-guided so that their child is able to *independently* enjoy using the app without required parental support. In part, this finding is consistent with earlier studies that have similarly shown that one of the general needs when it comes to media is entertainment (Sundar & Limperos, 2013). However, in this case, the need for entertainment is intertwined with a need that is specific to apps: independence. This suggests that parents are aware of the potential complexities of app use. Whereas with traditional media (e.g., television) independence is self-evident, the independence and ease of use of apps for children is less guaranteed. It seems that parents are aware of this potential challenge and are looking for apps that will minimize this complexity.

Similarly, in the need for co-education, parents attaching importance to selecting an app that offers educational input for their young child but, at the same time, parents want to play a role in this process. In work with traditional media, research has often shown that informational needs (e.g. education) in particular

Table 3
Factor loadings for parallel analysis with Varimax rotation of parental needs.

Parental needs items	Independent entertainment	Co-education	Familiarity	Tailored challenge	Pass time
My child wants to use an app by himself.	**0.79**	-0.05	0.04	-0.17	0.06
My child wants to have fun using an app.	**0.77**	0.01	0.16	-0.12	-0.13
I want my child to have fun when using an app.	**0.71**	0.26	0.02	0.00	-0.04
I want my child to be able to use an app independently.	**0.69**	0.04	-0.09	-0.13	0.16
My child needs to understand the purpose of an app.	**0.61**	0.12	0.04	-0.34	-0.03
I want my child to understand the purpose of an app.	**0.60**	0.30	-0.13	-0.19	0.00
I want my child to learn from an app.	0.28	**0.70**	-0.10	-0.11	0.12
I want to interact with my child when using an app.	0.08	**0.65**	0.24	-0.10	0.02
I want an app where my child learns to think about others.	0.08	**0.58**	-0.06	-0.14	0.33
I want to be able to set my own parental preferences in an app.	0.18	**0.46**	-0.08	0.04	0.10
What happens in an app has to be predictable to my child.	0.05	-0.05	**0.79**	-0.06	0.06
In an app, my child wants to repeat actions over and over again.	0.13	-0.06	**0.72**	0.23	0.21
My child needs to recognize things in an app.	0.35	0.12	**0.42**	-0.25	0.29
My child wants an app where he/she can imitate real life.	0.03	0.39	**0.40**	-0.07	0.26
In an app, my child wants to make progress fast.	0.18	0.02	0.04	**-0.72**	0.07
My child wants to be surprised when using an app.	0.12	0.19	-0.02	**-0.63**	0.17
In an app, my child is looking for change.	0.19	0.26	-0.19	**-0.62**	0.11
My child is looking for a challenge in an app.	0.17	0.34	-0.06	**-0.54**	0.12
My child needs to be rewarded in an app.	0.22	0.02	0.16	**-0.54**	-0.15
My child wants to identify with the characters in an app.	0.06	-0.04	0.23	**-0.53**	0.30
My child wants an app that teaches him/her new things.	0.18	0.38	-0.11	**-0.53**	0.20
My child needs to see results of things he does in an app.	0.36	0.07	0.19	**-0.52**	-0.06
I want my child to relax when using an app.	0.06	0.35	-0.03	-0.12	**0.68**
I want my child to be active when using an app.	-0.14	0.13	0.20	-0.20	**0.67**
I want my child to be occupied with an app, so I have time for other things.	0.09	-0.07	0.23	-0.05	**0.64**

Note. Factor loadings > 0.40 are in boldface. Omitted items (cross-loading or < 0.40) are removed from table.

motivate people to select media. However, in this case, it seems that this need has been intertwined with a need specific to apps: control. Whereas traditional educational media (e.g. *Dora the Explorer*) offer a specific lesson to its audience, the format and content of the program are fixed and thus parents have little to no control. An educational app, however, offers the potential to alter the format and/or content as desired. For example, parents may opt to allow Internet access during app play, may permit co-play with peers, or may customize content based on child age or knowledge. These features are specific to digital media, and it seems that parents are not only aware of them but in fact desire them when selecting apps – particularly educational apps – for their children.

Although to a much lesser extent, we also see that parents are looking for familiar, tailored, and challenging app-content for their children. These needs seem to be much more medium-specific – with an underlying recognition that apps have the ability to adjust content based on the user (e.g. Gay & Leijdekkers, 2014). Theoretically, these needs are consistent with research showing that content which is tailored to a child's skills and knowledge is effective in obtaining and maintaining the child's attention (Valkenburg & Vroone, 2004). Thus, it is not surprising that some parents see these needs as important when it comes to apps for their children as such content is likely attractive and appealing to their child.

Finally, a small subset of parents (about 10%) attach importance to apps that can help "pass time". While passing time is often a prominent general need, given the potential social undesirability associated with these items (and the negative stereotype of media as a babysitter), it is perhaps not that surprising that so few parents have suggested this as a key driver in selecting apps for their children. Although, it may also be true that parents do not privilege an app's ability to occupy their child when selecting the content. This does not mean, however, that the app will not be used to do so – just that, for the majority of parents, it might not be a major consideration when making app selections.

2. Study 2: the relationship between parenting style and parental needs

While study 1 revealed parents' needs that drive their selection of particular apps for their children, it is important to recognize that the U&G paradigm posits that these needs are expected to vary by individual characteristics. More specifically, Rubin (2009) argues that variations in individual expectations, attitudes, activity, and involvement lead to different behaviors and outcomes. One such relevant individual difference variable is parenting style – which is defined as the many specific activities of parents that influence their behaviors towards their children (Darling & Steinberg, 1993). In all, three parenting styles are most commonly delineated in the literature: *authoritative*, *authoritarian,* and *permissive* parenting (Aunola, Stattin, & Nurmi, 2000; Baumrind, 1971; Kaufmann et al., 2000). Authoritative parenting is most often characterized by a balance of warmth and involved parenting, while authoritarian parenting is typically characterized by a controlling and strict parenting style. Permissive parenting, in contrast, is characterized by a more *laissez-faire* approach to parenting with indulgent and/or neglectful behaviors. Authoritative parenting is generally argued to be the healthiest parenting style.

Research indicates that, in general, parenting style influences the parenting goals established by parents such that parents with a tendency towards authoritarian parenting establish more parent-centered goals while authoritative parenting is associated with increased child-centered goals (e.g. Hastings & Grusec, 1998). Even more, parenting style can influence whether and how parents mediate and/or monitor the media their children are exposed to (Eastin et al., 2006; Padilla-Walker & Coyne, 2011; Padilla-Walker, Coyne, Fraser, Dyer, & Yorgason, 2012; Rosen et al., 2008). For example, when it comes to managing their children's media use, authoritative parents typically use greater evaluative (i.e., discussing and explaining media content) and restrictive (i.e., rules regarding media amount and types) mediation techniques when compared to authoritarian or permissive parents (Eastin et al., 2006). Similarly, authoritative parents tend to engage in more

proactive media monitoring - that is, the supervision of what children are actively doing with media, and with whom, how, and when (Padilla-Walker et al., 2012).

Just as parenting style can influence parenting goals, media mediation, and media monitoring, parenting style may also influence parental needs when it comes to apps. As revealed in Study 1, when it comes to apps for children, parents have five overarching needs (the need for independent entertainment, co-education, a tailored challenge, familiarity, and pass time) that represent both parent-centered and child-centered perspectives. Combining the findings from Study 1 with existing research on parenting style and parenting goals, it is likely that parenting style may influence the degree which parents value particular needs. Study 2 is designed to investigate this potential relationship.

2.1. The relationship between parenting style and parental needs

2.1.1. Authoritative parenting

As noted, the most distinctive characteristics of authoritative parenting are warmth and involvement (Baumrind, 1971; Campbell, 1995; Eastin et al., 2006). In particular, parental involvement (i.e., involvement which values child's self-autonomy) has been shown to influence parental decisions made in children's education (Hoover-Dempsey & Sandler, 1995). For example, parents that typically focus on teaching and encouraging exploration in a self-autonomous manner while maintaining a consistent, supportive presence tend to be highly involved with their child. It is not surprising that this parenting style is therefore typically associated with parents who have child-centered goals (Chan, Bowes, & Wyver, 2009; Hastings & Grusec, 1998).

In terms of the specific relationships between authoritative parenting and the identified needs in study 1, several expectations can be posited. First, given the typical goals of authoritative parenting, it is likely that the more parents engage in authoritative parenting, the more likely it is that they will express a need for independent entertainment (H1a) since this need places a strong focus on the autonomy of the child (a key goal emphasized in authoritative parenting; Hubbs-Tait, Kennedy, Page, Topham, & Harrist, 2008). Additionally, since these parents tend to privilege their child's education, it is also likely that parents who predominantly adopt authoritative parenting will be more likely to attach importance to the need for co-education when selecting apps (H1b). Third, because authoritative parenting is typically associated with parents who have child-centered goals (Chan et al., 2009; Hastings & Grusec, 1998), it is reasonable to suggest that parents primarily adopting this style are more likely to value a need for familiarity and tailored challenge as both are child-centered need (H1c, H1d). In the same vein, since the need to pass time is focused heavily on the parent-centered perspective as opposed to the child-centered perspective, it is likely that parents primarily adopting an authoritative style are less likely to find fulfilling this need important when selecting apps for their child (H1e). In sum, we hypothesize:

H1. Authoritative parenting is …

(a) positively associated with the need for independent entertainment,
(b) positively associated with the need for co-education,
(c) positively associated with the need for familiarity,
(d) positively associated with the need for tailored challenge, and
(e) negatively associated with the need to pass time.

2.1.2. Authoritarian parenting

As noted, the goals that parents who engage primarily in authoritarian parenting set are more parent-centered (Hastings & Grusec, 1998), indicating self-oriented goals that involve obedience or short-term compliance. In particular, authoritarian parenting is characterized by parents who want to have control over what their child is exposed to as well as parents who have goals oriented on the self instead of the child. Consequently, when selecting apps for their children, it is likely that parents adopting an authoritarian style may value parental needs that are parent-centered and value parental control. As a result, we expect that the more parents engage in authoritarian parenting, the more likely they are to attach importance to the need for co-education and pass time, since both are parent-centered needs with co-education valuing control and pass time emphasizing parental benefits (H1b, H1e). Counter to this, we expect that parents who engage primarily in authoritarian parenting are less likely to find the needs for familiarity or tailored challenge to be particularly important since these needs focus on the child (H1c, H1d). Lastly, when it comes to the need for independent entertainment, we similarly expect that parents adopting an authoritarian style will find this need less important when selecting apps for their child. As described above, this need privileges children's autonomy whereas authoritarian parenting is associated with parents who often rely on a strict form of parenting in which the child has little to no autonomy (H1a). In sum, we hypothesize:

H2. Authoritarian parenting is …

(a) negatively associated with the need for independent entertainment,
(b) positively associated with the need for co-education,
(c) negatively associated with the need for familiarity,
(d) negatively associated with the need for tailored challenge, and
(e) positively associated with the need to pass time.

2.1.3. Permissive parenting

Parents adopting a permissive style are more likely to be more indulgent or neglectful in selecting media for their children and are most likely to let their child be in control in this selection process (Rosen et al., 2008). As a result, it is likely that parents engaging in this style tend to value apps that can occupy their children's time (H1e) and, on the contrary, find little importance in apps fulfilling other parent- or child-centered needs (H1a, H1b, H1c, H1d). Therefore, we hypothesize:

H3. Permissive parenting is …

(a) negatively associated with the need for independent entertainment,
(b) negatively associated with the need for co-education,
(c) negatively associated with the need for familiarity,
(d) negatively associated with the need for tailored challenge, and
(e) positively associated with the need to pass time.

2.2. Study 2 method

2.2.1. Procedure and participants

The same participants and survey procedure were used for Study 2 as with Study 1 (i.e., data from the same 591 parents were included in the analyses).

2.2.2. Measure

In addition to including the five overarching needs that were identified in Study 1, the Study 2 analyses also incorporate a measure of parenting style. Specifically, parenting style was

measured using 20 items adapted from the Parenting Styles and Dimension Questionnaire (Robinson et al., 1996). These adapted items have been used successfully in other research (Piotrowski, Lapierre, & Linebarger, 2013). For each item, parents were asked how often they exhibit a particular behavior towards their child (i.e. "I encourage my child to talk about (his/her) troubles" and "I find it difficult to discipline my child") on a Likert scale from 1 "almost never" to 5 "very often". Because parenting styles are not mutually exclusive (Robinson et al., 1996), a mean score was calculated for each parent on each of the three parenting styles. This means that the same parent might have high authoritative scores, high authoritarian, and moderate permissive scores, depending on their self-reported parenting behaviors. Three parenting style scales were constructed: *authoritative* parenting, characterized by warmth and involvement (7 items, $M = 4.26$, $SD = 0.46$, $\alpha = 0.85$); *authoritarian* parenting, characterized by non-reasoning and punitive strategies (6 items, $M = 1.88$, $SD = 0.56$, $\alpha = 0.75$); and *permissive* parenting, characterized by lack of follow-through (7 items, $M = 2.46$, $SD = 0.56$, $\alpha = 0.74$).

2.3. Study 2 results

Multiple regression was used to investigate the relationship between parenting style and parental needs. Specifically, the five needs identified in Study 1 (i.e., need for independent entertainment, co-education, familiarity, tailored challenge, and pass time) served as dependent variables in five models while three parenting styles (authoritative, authoritarian and permissive) served as independent variables (see Table 4) in each model. In doing so, we were able to obtain a clearer picture on the relationship between parenting style and needs. All models included parent gender, parent education, child gender, and child age as covariates and met the statistical assumptions of multiple regression. Table 5 presents the complete correlation matrix of all model variables. All covariates did show significant correlations with (some) of the dependent variables (see Table 5).

2.3.1. Descriptive statistics

The analyses show that model covariates (i.e., parental gender, parent education, child age, and child gender) correlate with some of the identified parental needs. As depicted in Table 5, mothers express a greater need for independent entertainment as well as a greater need for a tailored challenge. Parents with less formal education attach greater importance to the need for co-education and passing time. In terms of child gender, parents of girls tend to show a greater need for familiar content. Lastly, parents of younger children tend to express a greater need for co-education, familiar content, and pass time while for older children, parents have a more pronounced need for tailored, challenging content.

2.3.2. Authoritative parenting

H1 predicted that authoritative parenting would be positively associated with parents' attached importance to the need for independent entertainment (H1a), co-education (H1b), familiarity (H1c) and a tailored challenge (H1d). Findings indeed indicate that the more parents engage in authoritative parenting, the more importance they attach to their need for independent entertainment ($\beta = 0.42$, $t(583) = 9.83$, $p < 0.001$), co-education ($\beta = 0.27$, $t(583) = 6.05$, $p < 0.001$), familiarity ($\beta = 0.19$, $t(583) = 4.24$, $p < 0.001$) and the need for a tailored challenge ($\beta = 0.20$, $t(583) = 4.37$, $p < 0.001$), thus supporting H1a, H1b, H1c and H1d. H1e predicted a negative association between authoritative parenting and the need to pass time. The analysis shows that authoritative parenting was not associated with the need for using an app to pass time, rejecting H1e.

2.3.3. Authoritarian parenting

H2 predicted that authoritarian parenting would be positively associated with parents' attached importance to co-education (H2b) and pass time (H2e) and be negatively associated with the importance of a need for familiarity (H2c), tailored challenge (H2d), and the need for independent entertainment (H2a). Findings do indicate that the more parents engage in authoritarian parenting, the more importance they attach to the need for co-education ($\beta = 0.12$, $t(583) = 2.31$, $p < 0.05$) and the need to pass time ($\beta = 0.11$, $t(583) = 2.14$, $p < 0.05$), thus supporting H2b and H2e. Authoritarian parenting was not associated with the need for independent entertainment (H2a), familiarity (H2c), or a tailored challenge (H2d), thus rejecting H2a, H2c, and H2d.

2.3.4. Permissive parenting

H3 predicted that permissive parenting would be positively associated with parents' attached importance to the need for apps that pass their child's time (H3e) and negatively associated with all other parental needs (H3abcd). Indeed, the analysis indicates that the more parents engage in permissive parenting, the more importance they attach to the need to pass time ($\beta = 0.15$, $t(583) = 3.08$, $p < 0.01$), supporting H3e. All other hypotheses were rejected such that permissive parenting was positively associated with the need for familiarity (H3c) ($\beta = 0.13$, $t(583) = 2.78$, $p < 0.01$) and unassociated with the need for independent entertainment (H3a), co-education (H3b) and a tailored challenge (H3d).

2.4. Study 2 discussion

Study 2 investigated the degree to which parental needs may differ by parenting styles. As U&G theory posits, individual differences are crucial towards understanding the needs that individuals express (Rubin, 2009). In all, findings in this study support the

Table 4
Multiple regression analysis of parental needs and parent- and child characteristics.

	Need for independent entertainment			Need for co-education (PC)			Need for familiarity (CC)			Need for tailored challenge (CC)			Need to pass time (PC)		
	*b**	*SE b**	*β*	*b**	*SE b**	*β*	*b**	*SE b**	*β*	*b**	*SE b**	*β*	*b**	*SE b**	*β*
Authoritative	0.43	0.04	0.42*	0.32	0.05	0.27*	0.22	0.05	0.19*	0.21	0.05	0.20*	0.05	0.07	0.04
Authoritarian	-0.03	0.04	-0.04	0.12	0.05	0.12*	0.09	0.05	0.09	-0.01	0.05	-0.02	0.13	0.06	0.11*
Permissive	0.00	0.04	0.00	0.01	0.05	0.01	0.13	0.05	0.13*	0.03	0.04	0.03	0.18	0.06	0.15*
Parental Gender	0.04	0.04	0.04	0.01	0.05	0.01	-0.04	0.05	-0.03	0.05	0.04	0.05	0.04	0.06	0.03
Parental Education	-0.01	0.01	-0.03	-0.08	0.02	-0.19*	-0.05	0.02	-0.11*	-0.04	0.02	-0.11*	-0.08	0.02	-0.17*
Child Gender	-0.04	0.04	-0.05	-0.03	0.04	-0.03	0.10	0.04	0.09*	0.02	0.04	0.02	-0.02	0.05	-0.01
Child Age	0.02	0.01	0.05	-0.03	0.02	-0.08*	-0.07	0.02	-0.17*	0.07	0.02	0.18*	-0.03	0.02	-0.06
R^2	0.20			0.10			0.11			0.08			0.08		
F	20.14*			9.33*			10.09*			7.38*			7.42*		

Note. *$p < 0.05$. PC = scale consists of only parent-centered items. CC = scale consists of only child-centered items.

Table 5
Correlation matrix of parental needs and parent- and child characteristics.

	Need for IE	Need for CE	Need for F	Need for TC	Need to PT	Authoritative	Authoritarian	Permissive	Parental gender	Parental education	Child gender
Need for IE											
Need for CE	0.33*										
Need for F	0.17*	0.21*									
Need for TC	0.46*	0.38*	0.20*								
Need to PT	0.12*	0.28*	0.32*	0.30*							
Authoritative	0.43*	0.21*	0.13*	0.19*	-0.05						
Authoritarian	−0.22*	0.01	0.10*	−0.10*	0.18*	−0.43*					
Permissive	−0.12*	0.02	0.17*	−0.05	0.21*	−0.21*	0.57*				
Parental Gender	0.14*	0.08	0.01	0.10*	0.02	0.23*	−0.14*	−0.10*			
Parental Education	0.00	−0.15*	−0.05	−0.08	−0.12*	0.05	0.02	0.06	−0.11*		
Child Gender	−0.03	−0.01	0.10*	0.02	−0.00	0.03	0.02	0.02	0.00	−0.02	
Child Age	0.01	−0.10*	−0.21*	0.16*	−0.08*	−0.10*	−0.04	−0.12*	−0.05	−0.08*	−0.02

Note. *$p < 0.05$. IE = Independent Entertainment, CE = Co-Education, F = Familiarity, TC = Tailored Challenge, PT = Pass Time.

assumption that parenting style is associated with the importance that parents attach to particular needs when it comes to apps for their children – although the findings were not always as we initially anticipated.

In general, research on parenting styles has indicated that authoritative parenting is associated with the healthiest long-term development (Baumrind, 1971; Kremers, Brug, De Vries, & Engels, 2003). Characterized by both warmth and involvement, parents adopting this parenting style typically focus on teaching and encouraging exploration in a self-autonomous manner while maintaining a consistent, supportive parental presence (Baumrind, 1971). In doing so, it is argued that children learn how to successfully work through challenging and stressful situations both during childhood and later in life (Crossley & Buckner, 2011). It is reasonable, then, that parents who employ an authoritative style are parents who attach importance to apps that encourage independent entertainment, enable co-education, rely on familiar content, and challenge their children in developmentally appropriate ways. These parents want their child to have an enjoyable self-guided experience to support their child's autonomy, but at the same time, believe that this experience will be healthiest when they can play a role in structuring the educational messages and when the content best fits their child's unique needs.

While our expectations for authoritative parenting were met, our findings for authoritarian and permissive parenting were not always consistent with our expectations. Somewhat surprisingly, with some exceptions (namely, co-education and familiar content), it seems as though authoritarian and permissive parenting styles held rather similar associations with parental needs. In particular, both styles were associated with a greater importance for apps to pass time. Considering that only a small percentage of the respondents reported this need (10%), the fact that parenting style was still able to explain a respectable percentage of variance (11% and 15%) amongst this subset of parents is notable and may reflect a key distinction among parents. Whereas authoritative parenting seems to be related with a more thoughtful use of apps for young children, parents who adopt an authoritarian and permissive style are comparably more interested in how an app can occupy their children.

While more research is needed to understand how these parenting styles are related to media use, it is possible that the differences between authoritative parenting on the one hand and authoritarian and permissive on the other hand are due to differences in parental involvement. Moderate parental involvement (i.e., involvement which values child's self-autonomy, most often associated with authoritative parenting) has been shown to predict increased academic achievement (Fan & Chen, 2001; Hill & Craft, 2003), greater educational aspirations (Hong & Ho, 2005), and improved homework skills (Hoover-Dempsey et al., 2001). On the other hand, the strict form of controlling involvement in which children have no autonomy (i.e., characteristic of authoritarian parenting) or a complete absence of parental involvement (i.e., characteristic of permissive parenting), are both associated with maladaptive behaviors (Piotrowski et al., 2013). It may thus be that the similar patterns for permissive and authoritative parenting styles both reflect the fact that these styles tend to rely on a suboptimum level of involvement – namely, high in the case of authoritarian parenting and low in the case of permissive parenting.

3. General discussion & conclusion

Across two sets of analyses, the aims of this research were twofold: (1) to identify the most prominent parental needs that parents express when selecting apps for their young children (3–7 years old) and, (2) to investigate the extent to which different parenting styles are associated with variations in these needs. Guided by uses and gratifications theory, study 1 revealed that parents have five overarching needs when it comes to apps for their children (the need for independent entertainment, co-education, familiarity, a tailored challenge, and to pass time), while study 2 showed that these needs vary by distinct parenting styles.

As expected from previous U&G research, the identified parental needs reflect both general (i.e., not medium specific) and app-specific needs. Of five needs, the need for independent entertainment was by far the most prominent need expressed in this sample– with more than 80% of parents attaching high importance to this need. It was also clear that some of these needs are more parent-centered (outcomes in favor of the parent) while others were more child-centered (outcomes in favor of the child). Interestingly, parents' most important need (independent entertainment) has both parent- and child-centered dimensions. This suggests that parents are primarily seeking apps that entertain their children while encouraging their child's autonomy, not only because they believe such enjoyment and autonomy is important, but also because they feel their children will react favorably to such apps.

To our knowledge, this is the first empirical study to incorporate a U&G perspective to young children's media use – perhaps because of the challenging dynamic between the media selector (the parent) and the media user (the child). However, given the theoretically consistent findings in this study, we believe that taking this perspective is valuable for understanding the underlying dimensions of parental media selection. That said, we also would

suggest that further refinement and study replication is worthwhile. Although the qualitative methods used in this study were a valuable well-informed first step, it is important to note that the development of the parental needs assessment was rather complex. In particular, this measure relied on information obtained from in-depth interviews with parents of children who already are experienced with touchscreens. It is possible that we omitted a crucial set of needs by omitting families that do not presently use apps at home. It is also possible that our interviews simply did not yield the full scope of relevant needs. Replication of this study would provide added confidence in the set of needs identified here. Alongside such replication, efforts to validate our measure by establishing test-retest reliability, construct validity, and cross-population validity would be a valuable next step.

Study 2 highlighted that, as expected, parental needs are not universal. In particular, parents who more frequently engage in authoritative parenting seem different than parents who adopt an authoritarian or permissive style. Most notably, the more parents rely on an authoritative parenting style, the greater importance they place on apps that can entertain and educate their child. At the same time, they are looking for apps that are developmentally sensitive to their child's specific needs via both tailored and familiar content. However, the more parents engage in authoritarian and permissive parenting, the more they express a desire for apps to occupy their children. Although not investigated in this study, children may be receiving (implicit) messages about apps that are influenced by these styles – and, consequently, these messages may influence the effect of apps on young children. Work with traditional media does suggest that parental perspectives on media use do trickle down to children (Jordan, 2005). Therefore, one area for relevant follow-up work would be to identify whether and how parenting style may influence the effects of apps on young children.

Moreover, related to parenting styles, it is important to recognize that this study looked at the report of one parent. This is a common approach in the parenting style literature. However, it is possible that different parents have varying parenting styles. These styles are likely to work together in unique ways to not only predict the media rules in the home, but also the specific types of media that children are exposed to. One interesting route to pursue, then, is to understand how parenting styles may accumulate to influence young children's home media environment. Furthermore, presently, we focused exclusively on parenting style and how this characteristic influences parental needs. Without question, there are certainly other parent (e.g., parental education), child (e.g., age, gender), and household characteristics (e.g., household density) that are important to consider both in terms of the needs that parents express as well how these needs are ultimately fulfilled. Rather than looking at parenting style as the end-all-be-all, we view this study as a first step in understanding how needs may vary by individual differences.

Moving forward, we encourage researchers to consider the U&G framework as they work to understand how parents select media content for their children. Replication and extension studies which evaluate the contours of the findings presented here are certainly important, both in terms of the needs identified as well as the characteristics which may explain variations in these needs. Moreover, we hope to see studies that go beyond identifying these needs to identifying how these needs can be fulfilled. If we can, for example, identify which specific app features parents believe will gratify these needs, we can offer important insights for app developers. Until then, we believe this study offers a key starting point by highlighting not only what parents are looking for apps, but also how this differs based on their approach to parenting.

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