

## 1 Introduction

The Child-Computer Interaction (CCI) community strives to find a balance between the influence of parents in determining the use of certain technologies and assisting the child while using these [13]. When parents are held responsible for children's use of online platforms and its consequences [16], we overlook important design opportunities that support parents and children to gain a thorough understanding of the ins and outs of these platforms. Hence, in this paper, we revisit the problem space for the design of functionalities that define the role of parents in young children's interactions by reporting on a case study of an online entertainment platform. We ground our findings at the intersection of media studies (particularly parental mediation theory) and the post-modern notion of the child. Following the former, we emphasize the role of parents in mediating children's online risks *and* opportunities, and, following the latter, firmly acknowledge the capabilities of young children to make decisions in the (online) environments they interact with. The methodology of this paper is inspired by Value-Sensitive Design (VSD) to study the values of designer and user stakeholders towards such functionalities. Besides the design team of an online entertainment platform, we involved parents with at least one child aged 4 to 10 to explore their values related to the role of parents in young children's media use. To the best of our knowledge, there is no research in the realm of CCI that has explicitly dealt with such a consideration of perspectives. The contribution of this study is the formulation of design guidelines for functionalities that afford parental access to children's online possibilities to play, learn and socialize.

## 2 The role of parents in children's digital media use

Traditionally, parental mediation studies have placed a heavy burden on parents to prevent risks and harm caused by children's media use. Parental mediation scholars have studied a broad range of strategies [19] parents employ to guide the media use of children from birth until adolescence, and have accounted for different media devices ranging from television to tablets, apps and games. Previous studies have shown that checking the child's media activities (i.e., monitoring) [7], discussing children's media use (i.e., active mediation) as well as imposing restrictions (i.e., restrictive mediation) can all form effective strategies to reduce harmful media experience in children [9,15]. Recent parental mediation studies have increasingly acknowledged that there are trade-offs to be made between mediating risk factors on the one hand, and supporting education and participation for beneficial use of digital media on the other hand. For instance, allowing self-exploration online is likely to elicit more risky situations for children, but at the same time it also provides children with important learning experiences. These 'trial and error' learning experiences are believed to raise awareness of risky online behaviour. Moreover, they may arm the child with resilience to cope with possible future harmful situations [1]. When parents of young children solely adhere to parental strategies to mitigate online risks, parents may overlook ways to support the opportunities [12] linked to children's own experiences of the online world by using digital devices. Parents recognize their role in facilitating these learning experiences, but feel worried about how to manage the tensions between keeping children safe and allowing children to learn, develop media skills and have fun [17]. Moreover, the complexity of data analytics makes it increasingly difficult for parents to understand how the platforms that their children use operate - in terms of e.g. game mechanics, personal data gathering [8] and in-app purchases [4]. The functionalities that are currently embedded in child platforms and parental controls (i.e., technologies that enable parents to define time, content and activity restrictions, and monitor children online) are unlikely to provide appropriate support to parents [18]. In line with the current challenges proposed by parental mediation studies, this paper will argue that the conceptualization and design of technologies for children should account for an appropriate role for parents in building child resilience online and enhancing media literacy.

The discussion of what can be considered as an appropriate role for parents in young children's use of digital products, boils down to a reflection on the notion of the child. Simply put, it considers how the child is being conceptualized. In the Sociology of Childhood, 'old' and 'new' views place the child

on a spectrum that considers the child from a 'vulnerable other', on the one hand, to an 'active agent' on the other. In the 'old' modernist approach, children were reified as a construct characterized with dependency, vulnerability, innocence and a lack of agency [2,3]. These traditional beliefs of childhood as 'innocent' and 'in need of protection' have been problematized and are increasingly contested by 'new' scholars in the Sociology of Childhood. More particularly, postmodernist thinking rejected the hierarchical notion of the parent as the one with power over the child [2].

In accordance with the postmodernist perspective, we argue that the next generation of functionalities that influence young children's self-exploration of the online world should support the young minds that are capable of making sense of what happens [10] in an online environment. Most recently, the field of CCI has acknowledged the urgency to design online environments with parental controls that children can benefit from [11] and allow child autonomy while reducing the need for parental intervention [5]. In effect, thanks to children's access to the digital world, children increasingly acquire knowledge and skills about new technologies. Therefore, we consider how design can offer children a more balanced support from their parents, so young users of digital platforms can acquire and put to use their knowledge and skills.

### **3 Methodology**

This study reports on the conceptualization and design of an online entertainment platform for children aged 4 to 10 that includes functionalities for parents to define their children's possibilities to play and communicate. We adhere to a Value Sensitive Design (VSD) approach in order to address possible value tensions between user (parent) and designer values. Values were regarded as something a person or a group of persons consider(s) important in life [14]. The procedure of this study consisted of three phases. The first phase concerned a workshop with the lead design team, with the goal to explore the values that drive the design decisions for a platform used by families with young children. The second phase entailed laddering-inspired interviews to understand the values that guide parents' understanding of their role in children's use of online gaming platforms<sup>1</sup>. The third phase constituted of another workshop with the lead design team to discuss how design values can be aligned with parental values. Flemish<sup>2</sup> participants took part in this study.

#### **3.1 Phase 1: Design Value Exploration**

We facilitated a workshop with five participants: one game designer, two experts in education sciences and ICT, one digital project manager, one communication specialist. The goal of this workshop was to distil the design values attributed to the different roles parents might play when children engage with an online entertainment platform (cfr. parental mediation strategies). We introduced personas that resulted from a qualitative study on parental mediation strategies [19] to identify the different roles parents can take up in their children's media use (15'). We prepared a set of questions for each persona: e.g., how can a technical intervention help Olivia to monitor her daughter's online educational activities, while keeping time for recreation? The participants were asked to come up with ideas for the persona problem statements (40'), by writing these ideas on post-its and categorizing them in meaningful clusters (40'). Lastly, the participants individually rated the most worthwhile ideas with a golden sticker (35'). During this last step, we moderated the discussion, loosely following the UX Laddering interview protocol [20] to distil design values from a Means-End Chain Theory perspective. More particularly, we inquired into how the participants perceived certain (categories / functionalities of) ideas as likely to yield certain desired consequences and potentially serve values the design team is concerned with [6]. To achieve this,

---

<sup>1</sup> Children were included in the second phase. The child data were excluded from this article because the research activities were directly related to child play preferences rather than their understanding of the role of their parent(s) in their use of the entertainment platform.

<sup>2</sup> Flanders is the Northern Dutch speaking region in Belgium

we incessantly asked ‘why’-questions, e.g. “Why do you prefer that [idea]? Why is that [consequence] important to you?”. Ultimately, this yielded a set of values, based on which the group collectively selected the most important values. The workshop was audio recorded. Pictures were taken of the post-its after each phase.

During analysis, the audio recordings were transcribed and analysed qualitatively in Dedoose. The photo material supported the analysis and were triangulated with the transcripts. We iteratively discussed and coded the data in three main categories, based on the Means-End Chain Theory (i.e., attributes, consequences and values). Ultimately, the analysis yielded six design values.

### 3.2 Phase 2: Family Laddering Interviews

The second phase uncovered the values of 11 parents with young children. The parents were recruited through a recruitment firm, our own network and snowball sampling. The final sample included two reconstituted families, three single parents, and six married parents. Five parents had more than one child, but the interview focused on the child aged 4 to 10. The sample included eight low and three high middle-class families.

Phase 2 consisted of two contact moments. First, the interviewer (first author of this paper) introduced the parents to an early version of the entertainment platform to familiarize them with the affordances of the platform and the parental functionalities during two weeks. The goal was to make concrete comparisons between the rationale of the parents related to a fixed set of functionalities. Then, the interviewer conducted interviews based on the UX Laddering protocol with four fathers and ten mothers at the family’s home. The parent who agreed to participate was interviewed, together with the partner if this person was also present.

As a starting point for the parent interview, the interviewer presented two design concepts with distinct functionalities (see figure 1). The first concept only afforded restrictive functionalities (i.e., monitor chat, and restrict time, content and communication). Contrarily, the second concept introduced functionalities that give the parent insight into the progress of the child (i.e., overview of obtained starts and badges). All these functionalities were part of the platform they tested.

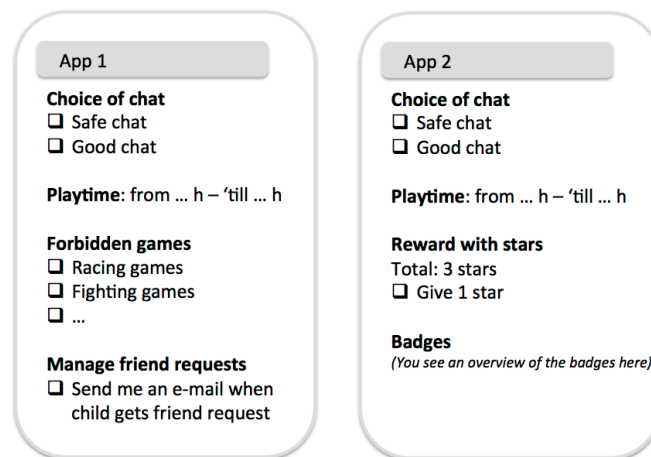


Figure 1. Two design concepts presented to the parents

The interviewer started by asking the parent which design concept they preferred, to then gradually uncover the underlying values by asking ‘why do you prefer [x]? why is that important to you?’ Interviews were recorded and transcribed. The audio files were between 35 and 70 minutes long (average: 49 min). The interview data were anonymized and analysed qualitatively, using Dedoose as analysis tool. Similar to the analysis protocol of phase 1, we discussed and coded the meaningful elements with the main categories of Means-End Chain Theory. The analysis of the interview data ultimately yielded five values.

### 3.3 Phase 3: Value Alignment Workshop

The third phase concerned a value alignment workshop in which the design stakeholder values (cf. phase 1) were discussed and related to the values of the user stakeholder groups (cf. phase 2). Four members of the design team of the media platform (one game designer, one digital project manager, one brand manager and one communications intern) participated in the workshop. We first presented the values that were revealed in phase 1. Each value was presented on a separate orange card (see figure 2, left), and participants were asked to visualize a value hierarchy by mapping the cards from bottom (least important) to top (most important) on a magnetic board. Then, we introduced the five parental values resulting from phase 2 on separate blue cards (see figure 2, right). We asked the participants to position these along their own value hierarchy. During this process, they were encouraged to think out loud, discuss similarities and conflicts between the values of both stakeholder groups, and negotiate how possible value dilemmas could be addressed. The entire workshop was audio recorded, transcribed and analysed qualitatively in Dedoose. Similar to phase 1 and 2, we iteratively coded the data following the Means-End Chain Theory categories.

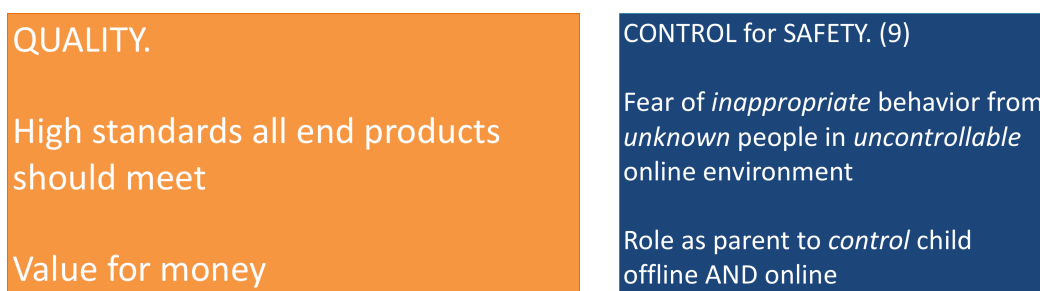


Figure 2. Example of (left) design value card, and (right) parent value card

## 4 Results

Table 1 summarizes the dominant values per stakeholder (separate columns for designer and parent values). Each value is exemplified by a meaningful quote, linked to a participant (e.g., P2 for parent of family 2). The ranking of the parental values is based on the number of parents who held a value in phase 2; this number is shown between brackets next to each value label. The design values that were uncovered in phase 1 and ranked in phase 3 were sorted accordingly in the table, with the prioritized values highest in the column. In line with the design challenge that originated from the literature review, we focus this section on values of 'safety' (in green) and 'involvement' (in yellow).

### 4.1 Control for child safety

When asked to reflect on designers' and parents' role in young children's digital media use, both stakeholder groups engaged in a safety discourse. They found it important to protect children from potential online risks, such as meeting strangers online. In phase 1, the game designer emphasized that his media company set high standards for the safety of their products.

*"It can't be rubbish, it has to be solid. Toys can't be unsafe. We are very strict on that." (game designer, phase 1)*

When conceptualizing the design of parental functionalities of the online media platform, the design team found it important to be able to address parents' need for control for safety.

*"You can't be careful enough on the Internet nowadays, with all the muddle you hear and read. Everybody can be anybody on the Internet. You have no control over it" (P11, phase 2).*

Parents emphasized the complexity of gaining control over their child online, as opposed to offline activities.

*“I find it easier to assess when it happens physically. If the youngest one [aged 7] asks to go to the skate park (...) then he can go there with his friend. And there are older children as well. But then I go have a look and then you see what happens and who hangs around and how they behave. (...) But online you have no idea whatsoever, no hold over, no control” (P7, phase 2).*

Corporate values (phase 1)	Parental values (phase 2)
COMMERCIAL SUCCES.	CONTROL for SAFETY. (9)
“They have to pay for it. We are a commercial company, you know.” (game designer)	“I think you have to be able to intervene as a parent.” (P2)
EDUCATION. In a FUN way.	INVOLVEMENT. (7)
“We call it ‘get smarter by having fun’.” (digital project manager)	“Just because it’s great to see how they develop and change.” (P4)
QUALITY.	MORALITY. (5)
“A lot of people know that if you go to a show, you get value for money.” (game designer)	“To not say: don’t do that. (...) I try to teach them values.” (P7)
TRUST.	INDEPENDENCE. (5)
“[Parents] will gladly spend money every month and get something they can trust in return.” (game designer)	“Just paddling one’s own canoe.” (P2)
SAFETY.	FUN. (4)
“I really tested it [chat function], as if I was of bad faith. I can’t get through.” (game designer)	“Once in a while it is fun to do that together with the kids.” (P5)
ENVIRONMENT.	
“Actually, we shouldn’t promote potato chips. We should go to the fruit auction and promote fruits.” (digital project manager)	

*Table 1. Stakeholder values, highlighting the values related to the design challenge (green for safety values, and yellow for involvement values).*

Most parents who participated in this study felt they lacked control over their young child’s online behaviour and could not achieve the same sense of safety they have over their child’s offline activities. The design team anticipated parental safety concerns by providing a safe chat environment on a closed game platform. This functionality matched the parents’ need to be in the know of who children might meet on the game platform and what they might talk about.

*“I really tested it [chat function], as if I was of bad faith. I can’t get through.” (game designer, phase 1)*

Parents of very young children (i.e. ages 4 to 6) further mentioned that, given the development stage of the child, they felt they have to take part in their children’s online activities. This stands in contrast with assisting older children, who have gained the skills to use digital media independently.

*“For the moment, it is not really relevant for her. But once she’s older and can read and such, then obviously I find it important to know what she’s doing and that I can control that a little.” (P3, phase 2)*

## 4.2 Parental involvement

In phase 2, most parents discussed the importance of knowing the thoughts and feelings of their children. Parents expressed that they could show they care by being interested in their young child’s playful activities.

*“I want her to, yeah, know that I am there for her and that, if something’s up, she can always come to me. (...) Making time is part of it. She likes to play and I show interest in it.” (P9, phase 2)*

Some parents believed that being involved in the activities their child is interested in, is inherent to raising children. For instance, if a child likes swimming parents could take their children to the pool to accommodate that interest.

*“If we, as parents, did not make the effort or were like ‘pfff it’s also weekend for us’ (...) then they [the children] don’t know it [aren’t exposed to new things].”  
(P10, study 2)*

The parents who participated in this study acknowledged that it takes up time and energy to be involved in their child’s development. However, they believed their efforts were likely to pay off in the future development of their child.

The design team dedicated significant effort in phase 3 to understand how parent’s value of ‘involvement’ manifests itself in their media education practices and how it could align with their own values. The discussion revolved around trying to understand when parents feel that they are sufficiently involved in their children’s online play. Referring to an Ikea commercial<sup>3</sup>, the brand manager defined parental disengagement as ‘the disease of our times’ and identified an opportunity to engage busy parents for short amounts of time through the platform.

*“You can’t tell parents to work less. [...] You can say: this activity takes 15 minutes.” (brand manager, phase 3)*

In an attempt to design for parental involvement, affording small activities that parents can perform together with their children, was identified as a key functionality of the platform.

*“Then you, as a parent, don’t feel guilty if you only have five minutes to spare. If it only starts at 45 minutes, parents will definitely feel guilty.” (digital project manager, phase 3)*

The design team concluded that it would be worthwhile to implement functionalities like a timer for parental involvement, to improve the quality of their platform which, ultimately, would lead to commercial success. In that sense, the parental value of involvement is related both the corporate values of quality and commercial success.

## 5 Discussion

Recent developments in parental mediation studies and the sociology of childhood pose challenges towards defining the role of parents in children’s experiences with online platforms. Challenges arise in terms of acknowledging children’s online skills and affording beneficial interventions from parents in children’s interactions with online platforms. Addressing these challenges is of importance to designers, corporate stakeholders, parents and children since a design focus on parents’ responsibility for children’s online safety, is likely to overlook design interventions that support children in gaining an understanding of the ins and outs of online platforms. In this study, we used a VSD-inspired research design to uncover design and user values towards the role of parents in children’s digital media use. To this end, we involved a design team from a Flemish media company and parents with at least one child aged 4 to 10. The results discussed parents’ dominant values towards their role in their children’s online activities, and related these to the design team’s views on how to account for these parental values when conceptualizing the design of an online platform for young children.

---

<sup>3</sup> The children are asked to write a letter to their parents, explaining what they would want to ask their parents for Christmas. The result is that the children ask their parents to spend more time with them, playing and experimenting, or dining together. Parents in the commercial believe they compensate for their lack of time by buying toys for their children.

See: [https://www.youtube.com/watch?v=3dAQ6\\_gXQy4](https://www.youtube.com/watch?v=3dAQ6_gXQy4)

The results presented important nuances for future design concepts that aim to account for parents' role in keeping children safe online. Parents felt they currently lack a sense of control over the online environments that their children navigate. These results suggest that the main design challenge for parents' role in online child safety is providing parents insight into the possibilities these platforms afford, which parents are unfamiliar with (e.g., anonymity of online conversations). This understanding is most important for parents of children that know how to read and write, since our results suggest parents feel less confident when children have gained these skills. While the design team designed for safety with a safe chat environment in mind, it is unclear in what way restricting the use of certain words might help parents to understand what types of (if any) offensive language their children might be confronted with when using the chat function. In this way, the design of a safe chat environment imposes important constraints for parents to play a meaningful role when children discover the possibilities and limitations of online communication.

Moreover, the results foregrounded the value of 'involvement' of parents who care about and respect the thoughts and feelings of their children. Parents explained they have to make an effort to adhere to this value. Taking into consideration that parents said they felt unfamiliar with certain platforms their children engage with, the results suggest that parents might benefit from functionalities that facilitate parental involvement in children's online interactions. The design team proposed well-defined activities that could allow parents to engage for a predefined period of time with one of the child's online activities. In line with the literature on parental mediation and the post-modern notion of the child, this functionality seems promising to explore the interactions between parents and children that strengthen the digital skills of families with young children. This paper presented the results of one case study, that gathered data for the design and concept evaluation of an online entertainment platform. Further research is needed to identify if the design and parental values can be generalized to a broader group of parents and design teams.

Furthermore, the focus of this paper lies on the views of adults in the role of parents in children's digital media use. We acknowledge that the contribution of this paper could benefit from young children's understanding of their parent's role. We encourage designers, practitioners and researchers to address this shortcoming in future work, by paying attention to children's views on how design might support parents in taking up a meaningful role in children's digital media use. In conclusion, this paper proposes two design guidelines for meaningful parental involvement in young children's online interactions. Platforms for young children should provide concrete clues to parents about how the platform's mechanisms define the child's possibilities to play and communicate. Also, new functionalities should enable parents to engage online with their young children in concrete, well-defined activities. Both guidelines serve as a starting point for the CCI community to research and design novel functionalities that enable parents to play a meaningful role in young children's interactions with digital platforms.

## **Acknowledgements**

This MiX-ICON project has received the support of iMinds (Interdisciplinary Institute for Technology), in collaboration with Studio 100, Monkube, Graphine, MICT, MM Lab, EDM; with project support of IWT. A big thank you to the parents that participated in this project.

## **References**

1. David Buckingham. 2003. *Media Education: Literacy, Learning and Contemporary Culture*. Polity Press, Cambridge, UK.
2. G Cannella. 2002. Global perspectives, cultural studies, and the construction of a postmodern childhood studies. In *Kidsworld: Childhood studies, global perspectives and education*, G.S. Cannella and J.L. Kincheloe (eds.). Peter Lang, New York.
3. P Christensen and A James (eds.). 2000. *Research with children: perspectives and practices*. New York.

4. Rosanne De Cock, Bieke Zaman, Maarten Van Mechelen, and Jonathan Huyghe. 2018. Early Gambling Behavior in Online Games: Parental Perspectives vs. What Children Report. In *Digital parenting: the challenges for families in the digital age*, Jorge A Mascheroni and Cristina Ponte (eds.). Nordicom, Nordic Information Centre for Media and Communication Research.
5. Alexis Hiniker, Sharon S. Heung, Sungsoo (Ray) Hong, and Julie A. Kientz. 2018. Coco's Videos: An Empirical Investigation of Video-Player Design Features and Children's Media Use. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*, 254:1–254:13. <https://doi.org/10.1145/3173574.3173828>
6. Frank Kardes, Maria Cronley, and Thomas Cline. 2010. *Consumer Behavior*. South-Western College Pub.
7. Sonia Livingstone and Ellen J. Helsper. 2008. Parental mediation and children's Internet use. *Journal of broadcasting & electronic media* 52, 4: 581–599.
8. Milda Macenaite and Eleni Kosta. 2017. Consent for processing children's personal data in the EU: following in US footsteps? *Information & Communications Technology Law* 26, 2: 146–197. <https://doi.org/10.1080/13600834.2017.1321096>
9. G Mascheroni, M. F. Murru, E Arestodemou, and Y Laouris. 2013. Parents. Mediation, self-regulation and co-regulation. In *Towards a better internet for children? Policy pillars, players and paradoxes*, B O'Neill, E Staksrud and S McLaughlin (eds.). Nordicom, Goterborg, 211–225.
10. Sarah H Matthews. 2007. A Window on the "New" Sociology of Childhood. *Sociology Compass* 1, 1: 322–334. <https://doi.org/10.1111/j.1751-9020.2007.00001.x>
11. Brenna McNally, Priya Kumar, Chelsea Hordatt, Matthew Louis Mauriello, Shalmali Naik, Leyla Norooz, Alazandra Shorter, Evan Golub, and Allison Druin. 2018. Co-designing Mobile Online Safety Applications with Children. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*, 523:1–523:9. <https://doi.org/10.1145/3173574.3174097>
12. J Palfrey, D Boyd, and D Sacco. 2008. *Enhancing child safety and online technologies: Final report of the Internet Safety Technical Task Force*. Retrieved from [http://cyber.law.harvard.edu/sites/cyber.law.harvard.edu/files/ISTTF\\_Final\\_Report.pdf](http://cyber.law.harvard.edu/sites/cyber.law.harvard.edu/files/ISTTF_Final_Report.pdf)
13. Janet C. Read and Mathilde M. Bekker. 2011. The nature of child computer interaction. In *Proc. of BCS*, 163–170.
14. Milton Rokeach. 1973. *The Nature of Human Values*. Free Pr.
15. Benjamin Shmueli and Ayelet Blecher-Prigat. 2011. Privacy for children. *Columbia Human Rights Law Review* 42, 3: 759–795.
16. Elisabeth Staksrud and Kjartan Ólafsson. 2013. Awareness: strategies, mobilisation and effectiveness. In *Towards a Better Internet for Children? European Policy Pillars, Players and Paradoxes*, Brian O'Neill, Elisabeth Staksrud and Sharon McLaughlin (eds.). Nordicom, Göteborg, 57–76.
17. Jane Vincent. 2015. *Mobile opportunities: exploring positive mobile opportunities for European children*. POLIS, The London School of Economics and Political Science, London, UK. Retrieved from <http://eprints.lse.ac.uk/61015/>
18. Bieke Zaman and Marije Nouwen. 2016. *Parental controls: advice for parents, researchers and industry*. Retrieved from <http://eprints.lse.ac.uk/65388/>
19. Bieke Zaman, Marije Nouwen, Jeroen Vanattenhoven, Evelien Deferrerre, and Jan Van Looy. 2016. A Qualitative Inquiry into the Contextual Factors Determining Parental Mediation Practices of Young Children's Digital Media Use at Home. *Journal of Broadcasting & Electronic Media* 60, 1: 1–22.
20. Bieke Zaman and Vero Vanden Abeele. 2010. Laddering with young children in User eXperience evaluations: theoretical groundings and a practical case. In *Proc. IDC 2010*, 156–165.