‘It’s like a cartoon character that can teach my children’: Expectations, perceptions and parental mediation practices of parents with Sima robot at home

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Extended abstract

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Introduction

Social robots are becoming more and more integrated into children's lives, for instance in health care (e.g., Al-Taee, Kapoor, Garett & Choudhary, 2016) and at home (Michaelis & Mutlu, 2017). Although research has dealt with children's acceptance of social robots at home (e.g. de Graaf, Allouch, & Van Dijk, 2019), the role of parents as important actors for children's social robot use and media monitoring has received far less attention. Parents exert considerable influence into children's media use, often determining which media, which type of content and for how long children use media (Jordan, Hersey, McDivitt, & Heitzler, 2006). If we consider social robots a new kind of media, a social actor with whom children can interact and play with, pressing questions emerge: Which are the impressions and considerations of parents' first experiences and encounters with social robots? Which robot characteristics are deemed important to decide to buy a social robot? Lastly, how do parents mediate the relationship between their child and their robot?

To address these questions, this study qualitatively and exploratively investigated parents' expectations, perceptions and mediation practices regarding a social robot (Sima robot), with an eye on how to improve these experiences in the future. The study fits within the ICA pre-preconference Communicating with Machines theme as it investigates the implications of incorporating artificial entities into the private home space.

Theoretical Framework

As human interactions with robots increase, we do not yet know enough about how initial expectations regarding the functionality and interaction capabilities would affect using a social robot with one's children in the home. The Computers as Social Actors (CASA) paradigm (Nass, Steuer, & Tauber, 1994) posits that people tend to interact with media the way they would interact with people. Considering the robot as a new type of social actor, participants were asked how the social robot functionalities, such as its degree of interactivity

and autonomy, would affect how parents perceive and treat the robot. In particular, it is posited here that if parents' perceived the robot to be interactive and personalized, that this may affect their usage intention, as personalization has been found to affect acceptance of a social robot in an educational context (Beer, Ashurst, Read, Kennedy, & Belpaeme, 2017).

Regarding parents' role as mediators of their children' social robot use, we were interested on three different types of parental mediation: active mediation, restrictive mediation, and co-use (Nathanson, 1999). Active mediation is when parents talk about and discuss with their children about the medium. Restrictive mediation includes setting rules to restrict the use of the medium. Lastly, co-using implies that the parent is present while the child uses the medium, sharing the experience of using it, but without actively commenting on the content of its effects.

Method

To answer these questions, the study presents the results of eight in-depth interviews with a select group of parents whom had recently purchased a social robot for home use. This group is select because the social robot in question (Sima robot) had been introduced only very recently in the Latin-American market (Chile specially). Product of a government-funded startup program, Sima robot (http://web.simarobot.com/) is a 22 cm tall, 14 cm wide, 8 cm deep anthropomorphic robot which uses a mobile phone app. This app communicates via Bluetooth with its 3D-printed body and through it, is able to perform movements (i.e. moving its arms and legs, leaning to one side). Once the telephone is inserted in the body, its screen becomes Sima's face, depicting eyes, mouth and cheeks. Through changing graphics in the screen, Sima can display a variety of facial expressions (i.e. happy, sad, interested, 'in love', etc). For a morphology of Sima see Figure 1.

Sima has two relevant characteristics. The first is its relatively affordable price ($195 at the time of writing), compared to pricier players in the social robot market (i.e. Nao). The second is its user-friendly web interface. In this interface, users can program SIMA to produce speech text, body movements and facial expressions, alone or in combination, in response to users' input text. Apart from a few pre-programmed texts, movements, bedtime stories and songs (in Spanish) which come already incorporated, all the actions and the content of SIMA are to be programmed by its users. Sima represents an interesting case study due to its high degree of programmable features such as speech, movements, audio (showing photos or videos), facial expressions and movements.

Figure 1 Sima robot (image source: simarobot.com)

Method

We interviewed 6 middle-aged parents, all of them with professional education and jobs. Participants were recruited with the help of Sima robot developers, whom asked participants for consent regarding their contact information but were further uninvolved with the interviews design, taking the interviews, or further analysis. The author obtained consent before each interview. The semi-structured interviews took place at the interviewees' home, lasted an average of 62 minutes and afterwards participants received a small monetary incentive. Main open-ended questions included: describing their very first encounter with Sima, which factors were important when deciding to buy it, how would they describe their Sima usage at home with their children, Sima's suitability for accompanying and playing with their children how do the children communicate and treat Sima (i.e. as similar to a human). The interviews were then analyzed using qualitative thematic analysis in MaxQDA (Braun & Clarke, 2006). Although the interviews included two professionals who used Sima with therapeutic purposes with children with autistic tendencies, the present abstract focusses in the semi-structured interviews with parents in a home context with regular children.

Results

Results show that Sima's functionalities and apparent ease of programming affected parents' first impressions with it. Most first encounters with the social robot occurred at innovation fairs tailored to the greater public. The main themes associated with parents first encounters were parents' appreciation of Sima's ease of use and its 'cute and tender' design (*Kawaii*). These characteristics positively influenced parents' buying intention. Interestingly, Sima developers' personality was named as a recurrent factor which influenced parents' liking of the social robot and their intention to buy it. Another theme which emerged were Sima's capabilities to perform a variety of facial expressions and its easy to program interface. It was mentioned that making Sima use their childrens' name was a particularly interesting feature, and this personalization positively affected parents' intentions to buy the robot.

As to parents' perceptions, after some weeks of use, they conceptualized Sima to be mostly a teacher companion which could play and teach their children, with some parents expressing they saw Sima as a type of 'cartoon character' with a teachers' personality, instead of seeing it as a person in its own right. *'It has a sweet personality… but it is more like a cartoon, and it is rather friendly… a teacher, but still not a person,'* remarked one mother. The robot was prominently used during weekends, in time slots of half an hour, due to the less demanding schedule of these days compared to weekdays.

As to parents' parental mediation style, they mostly tended to co-use Sima with their children, with restrictive mediation rarely mentioned. Parents mentioned that using Sima was demanding at times, because it required their constant monitoring. This 'monitoring' required parents to explain children how to use Sima, and accompany them while interacting with the robot, which would correspond to a more active mediation style. Particularly, parents had to instruct children on which phrases would be recognized by the robot. Further, children often requested parents' help in dealing with technical issues, for instance when the bluetooth connection failed. This monitoring took most of the time that parents used Sima together with their children. Remarkably, even when Sima would function well and the interaction ran smoothly, children asked most parents to co-play with the robot.

Conclusion

Study results suggest that a communication triangulation emerges between the child, the social robot, and the parental figure when introducing a social robot as a new social actor in the home sphere. Parents frequently co-used the robot with their children, which quickly turned into active mediation, as parents had to constantly monitor their child's use of Sima and explain the robot's features and games to their children. Because of the time required to actively use Sima together with their children, many parents reported that using Sima turned out to be more demanding than they initially thought. Unexpectedly, parents mentioned that they would prefer Sima to be entertaining, rather than educational, and that the robot came with more fun

pre-programmed games and features, instead of having to program the robot themselves, to make it less time-demanding to use with their children at home.

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