

Abstract of Expectations Management in Child-Robot Interaction

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1 Introduction

Robot applications for children are becoming more mature and are being prepared to be released on the market. The importance to responsibly and appropriately design child-robot interactions increases as these interactions become more elaborate and influential. We need to be especially aware of the consequences of our robot applications when things do not go according to plan. An example is when children expect to have a different interaction with the robot. As we will see later, this actually reduces the effectiveness of the social support the robot can offer.

In our paper ‘Expectation Management in Child-Robot Interaction’, published in the proceedings of RO-MAN 2017 Lisbon, we reflect on several of our user studies and investigated

1. what children expect, within the context of our project, of the interaction with a social robot;
2. what the effect was of misaligned expectations and
3. what we can do to manage expectations.

2 Background

In our paper we do not answer the question how expectations are formed. However, we want to highlight one driving force behind expectation formation and that is anthropomorphizing (ascribing human attributes to) robots [2]. Anthropomorphism is one of the key factors for success of social robots. However it goes wrong when people anthropomorphize too much and expect certain non-existing abilities [3].

In our paper we specifically focus on children in a social/emotional setting rather than a physical setting because 1) most research is focused on physical human-robot interaction (HRI) and 2) child-robot interaction (CRI) is fundamentally different from HRI with adults [1].

Our research is performed in the context of the Personal Assistant for a healthy Lifestyle (PAL) project. The aim is to create a social robot that supports the development of self-management skills of children with diabetes type I [4].

3 What Do Children Expect?

In the orientation phase of the PAL project we performed a co-design session designed to identify the needs, values and expectations of children with diabetes. We analyzed all the collected audio-visual data. We have found that children expect a more unconstrained, substantive and useful interaction with the robot than is possible with the current state-of-the art.

4 Effect of Expectation Misalignment

One of the functions of the PAL-robot is to stimulate the intrinsic motivation of children to keep a digital diabetes diary. We evaluated that functionality with 13 children for 3 weeks. During those 3 weeks we measured their diary adherence, motivation, and perceptions & attitudes towards the robot. During the exit-interviews some children mentioned that they had different expectations while others did not. We compared the aforementioned measures of children with misaligned expectations (4/13) with the others (9/13). We found that children with misaligned expectations added less content to the diary, felt less motivated, felt less related to the robot and viewed it as less sociable. Given the low sample size, the skewed distribution of participants and the ad hoc analysis it is important to do a more thorough study to better understand the consequences and mechanisms of misaligned expectations.

5 Expectation Management Strategies

In our paper we discuss three strategies for the management of expectations in child-robot interaction:

1. *be aware of and analyze children's expectations* — e.g. do not oversell the robot during recruitment and explicitly address the user's expectations during the introduction of the robot.
2. *educate children* — about how robots and artificial intelligence works, what it can and cannot do.
3. *make robots responsible for managing expectations* — e.g. by designing explicit robot behaviors to autonomously detect and adjust misaligned expectations.

6 Conclusion

It is important to manage expectations because it will lead to more effective child-robot interactions and ultimately to a higher quality of life for the children.

References

1. T. Belpaeme, P. Baxter, J. De Greeff, J. Kennedy, R. Read, R. Looije, M. Neerincx, I. Baroni, and M. C. Zelati. Child-robot interaction: Perspectives and challenges. In *Int. Conf. on Social Robotics*, pages 452–459, 2013.
2. T. Fong, I. Nourbakhsh, and K. Dautenhahn. A survey of socially interactive robots. *Robotics and autonomous systems*, 42(3):143–166, 2003.
3. M. Kwon, M. F. Jung, and R. A. Knepper. Human expectations of social robots. In *ACM/IEEE Int. Conf. on Human Robot Interaction*, pages 463–464, 2016.
4. R. Looije. Project website: Personal assistant for a healthy lifestyle, 2014. [accessed on 01-Feb-2017].