Survey investigating ethical issues concerning Robot Enhanced Therapy for children with autism

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Abstract. The use of partially autonomous robots in therapeutic contexts raises several ethical issues, starting with the degree of autonomy to be afforded to the robot. The more autonomous the robot, the less control therapists have over the robot-child interaction, raising the issue of where the responsibility for the robot’s actions lies. Autonomy also raises the problem of trust: are parents happy to have their child interact with a robot? Will the child trust the robot? The Eurobarometer study of public attitudes towards robots, shows that many people in Europe resist this idea of using robots in care. The aim of this paper is to investigate the ethical issues raised by the use of robots in therapy for children with ASD by means of a survey amongst caregivers, parents and teachers of children with ASD. We conclude that although in general stakeholders approve of using robots in therapy for children with ASD, it is wise to avoid replacing therapists by robots and to develop and use robots that have at what we call supervised autonomous interaction.

Keywords: social assistive robot, Autism Spectrum Disorders, Survey

INTRODUCTION

Impairment in social interaction is an important element of Autism Spectrum Disorders (ASD) and challenges researchers to find better treatments. This is also the case for children with ASD. Several kinds of treatments are being investigated to improve their capacity for social interaction and communication such as applied behavior analysis, peer-mediated training, video-modeling, social stories, etc. One of the proposed options is to use robots as tools to enhance therapy [1]. The project DREAM, funded by the European Commission under the FP7 framework, investigates so-called robot enhanced therapy (RET) for children with ASD. Roboticists develop social robots as Nao or Probo [2] which can interact with the child, while being supervised by the therapist. Therapists can use the robot to elicit prosocial behavior; the robot functions as a social mediator between therapist and child. However, robot developers and therapists are concerned about the ethical and societal acceptability of their tools and methods. As a recent Eurobarometer [3] study of public attitudes towards robots shows, many people in Europe resist this idea of using robots in care. 60% of EU citizens saying that robots should be banned in care of children, elderly people and people with disabilities. There is also still considerable opposition to using robots in other ‘human’ areas: 34% of respondents say robots should be banned in education, 27% are against the use of robots in healthcare and 20% oppose their use for leisure purposes (European Commission 2012: 11). Robot scientists are also sometimes confronted with negative responses to their work. Also, often robots are linked to science-fiction and are presented as dangerous for mankind. Some sound ‘apocalyptic alarm’ [4]. Therefore, we want to know what people think about RET. Do they think it is ethically acceptable to use robots for this purpose? Do they think it is helpful? Would parents trust their children to a robot? And if more autonomous robots were to be developed, would they trust a situation in which there is no adult supervision?

The philosophical discussion delivers two types of potential problems which both relate to the autonomy of the human person (therapists, parents, others). First, there are issues concerning privacy and data protection, issues which are also raised by many other ICTs. Second, there is the problem concerning robot autonomy and trust: how much (and what kind) autonomous behavior should the robot exhibit, that is, to what extent should the robot-child interaction be supervised and controlled by the therapist? More generally, can the parents trust their child “into the hands of the robot”?

METHODOLOGY

The questionnaire was mainly/also offered on-line by the free and open source online survey application LimeSurvey installed at the VUB webserver and was available in three languages English, Romanian and Dutch. Since robots exists in different shapes for wide range of applications, but our survey focuses on social robots we introduced this type of robot before the survey by means of a 1-minute video in Layman’s terms. The video contained short clips of a selection of currently most used robots as NAO, Keepon, Probo, Kaspar, Iromec platform, Pleo. As such robots were
shown that look like machines, (imaginatory) animals, humanoids and androids. No children were shown in the video.

The questionnaire was developed in a multidisciplinary team consisting of psychologists, therapists, engineers and ethicists and were based on guidelines and essential elements of questionnaire design and development in order to obtain a reliable and valid questionnaire [5].

We asked parents and therapists in Romania, Belgium, and the Netherlands. Participants were recruited based on databases of persons involved in our past research and messages were posted on relevant blogs, Facebook, and newsletters and websites of autism organizations. A total of 416 subjects participated in the study. Data from 22 participants were excluded from the analysis since the responses were incomplete. 22.59% of the participants were parents of children with ASD and 16.75% of the participants were therapists or teachers of children with ASD.

RESULTS

Our survey had the following results. In general, our respondents find it acceptable to use social robots in therapy for children with ASD. (This is a difference with Eurobarometer results about the use of robots in healthcare in general. We explained in a video the concept of a social robot, we used a neutral voice and did not show children; perhaps this made a difference.) However, our respondents are far more hesitant about the idea that these robots would replace therapists; most people think that robots should support the interaction between therapist and child, rather than replace the therapist. For instance, a significant number of people do not want the robot to respond automatically to the child’s behavior, without being tele-operated. The reason why in DREAM is worked towards supervised autonomous interaction [6]. Furthermore, some people are also worried about the possibility that the robot is perceived by the child as a friend, or as a human; our respondents are more positive about zoomorphic robots and the idea of the robot as a tool.

CONCLUSION

The use of robots for RET for children with ASD raises several ethical issues. The survey we conducted supports both the idea of the DREAM project to avoid replacement and to develop and use robots that have at most supervised autonomy. More generally, it seems that most people approve of using social robots in ASD therapy, which is in contradiction with the Eurobarometer study, provided ethical issues such as autonomy/trust and appearance are dealt with by the researchers and therapists. A more in depth discussion is found in [7]. Further research is needed to obtain a more comprehensive analysis of the ethical issues and to involve stakeholders in the development of robots for children with ASD.

Figure 1. Results Is it ethical acceptable that social robots are used in therapy for children with autism.

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REFERENCES


1 http://www.youtube.com/watch?v=DSkldpq49gD8.