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Additional elements on the use of robots for childcare*

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1. Introduction

Ethical concerns about the use of robots for childcare, such as the raised in Sharkey and Sharkey's article, certainly should be analyzed and taken into account by the scientific community. Issues such as privacy, restraint, deception, accountability, and psychological damage should be further analyzed. In this contribution some of these issues are commented on.

2. Main argument

From our perspective, the following additional elements need to be taken into account when analyzing the use of robots for childcare:

(i) **Robot usage regulation.** The use of robots for childcare purposes can and should be regulated, as is regulated the use of standard toys, video games, medicines, and some sport and therapy installations or devices (e.g. saunas, jacuzzis, solariums, swimming pools). In general, toys are labeled with some guidance, such as "Not recommended for children under X years old", "Do not use without the supervision of an adult", or "Do not use for long periods of time". In the case of sport and therapy installations or devices, warnings inform about the maximal period of time that the device should be used (sauna, jacuzzi or solarium), whether the device can be used by children or not, whether the device can produce damage to health (e.g. use of a solarium [sun-bed/tanning booth] can cause skin cancer, Diffey, 1987; Montague et al., 2001), or that children under X years old can not be left alone in the installation (in the case of swimming pools).

Similar messages could be used in the case of robot nannies. Studies such as the one presented in the paper under analysis will help in the setting-up of guidelines for

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the development of proper regulations. Besides, additional prevention measures such as mandatory training courses for parents who will use robots for childcare, or as in the case of medicines, the mandatory inclusion of very strict instructions about robot usage in the product package could also be applied. We can even think of the mandatory inclusion of informative messages about the nature of the robot every time it starts its operation, as for instance, "Hello, my name is R-nanny. I am a robot; I am not human." This reminds us of Asimov's robot laws that should be included in the robot's so-called positronic brain (Asimov, 1950). Some basic ethical messages or behaviors could be hardwired in the robot-nanny's firmware.

(ii) Differential analysis depending on the children's ages. As pointed out in the article, psychological damage can potentially arise from the extended use of robots in caring for babies and children under 5 years old. This is especially problematic when the robot is used as a primary care-giver, because of the affective bond that is produced in the child, which could affect the child's further emotional, social and cognitive development. However, we believe that the situation in children older than 5 years is different. It has not been demonstrated that the interaction with robots can produce damage after this age, and when the interaction is properly regulated, it can be beneficial: the robot can take care of the child when the parents are working or busy, the interest of the child in the robot can be used to enhance its curiosity in science, technology and education in general, and the robot can even be used to keep the child at home, away from bad influences (e.g. street youth gangs and drug dealers). In summary, a differential analysis and different regulations depending on the child's age are required.

(iii) Ethical use of stored information. As mentioned in Sharkey and Sharkey's article, there are ethical concerns about the possible misuse of records of children's lives taken and stored by robots (pictures, videos, and recordings of conversations), which concerns children's rights to privacy. This issue should be analyzed carefully. The current situation is that parents normally record parts of their children's lives using digital cameras, or even home surveillance systems. They have the control over these records, and normally they manage them properly. In the case that children's behavior would be recorded by third persons in schools or extra-curricular school activities, then these recordings must be destroyed. If robots would be involved in the recording process, then the same ethical criteria should be used. Therefore, recordings taken by own-home-robots should be managed by the child's parents, using the same criteria applied to the case when they record the digital material directly. Recordings taken by other robots should be destroyed. These procedures need to be law enforced, and similar regulations to those applied in cases of surveillance, and biometric and medical data management (e.g. Ethical, 2009), should be developed.

(iv) **Superiority of robot care over minimal care.** It is very important to analyze this idea further. The case of orphanages (in Romania) has been analyzed, but there is another negative situation that is much more common than children in orphanages: children left alone at home for a large part of the day (after school time), and without proper care because the parents work for long periods of time. As mentioned by the American Academy of Child & Adolescent Psychiatry, “*Every day thousands of children arrive home from school to an empty house. Every week thousands of parents make decisions to leave children home alone while they go to work, run errands, or for social engagements. It is estimated over 40% of children are left home at some time, though rarely overnight ...*” (AACAP, 2009). Leaving children alone at home is a very common phenomenon, for instance in the USA, a 2002 Census survey reported 9.75% of all children between the ages of five and fourteen years spending between 2–9 hours home alone (Overturf, 2005). Children affected by this situation are called latchkey children: “*latchkey kid or latchkey child refers to a child who returns from school to an empty home because his or her parent or parents are away at work, or a child who is often left at home with little or no parental supervision*” (Wikipedia, 2009).

Children who find themselves home alone can be affected in different ways: (a) Psychological damage can arise from being continuously left home alone; children have nobody to talk to and they become non-social isolates. The result is that they tend to have higher levels of behavioral problems such as depression, and lower levels of self-esteem than other children (Mertens, 2003); (b) Children can be introduced to illegal activities (e.g. traffic in drugs, youth gangs) at early ages, because nobody controls their activities, they have plenty of time, and they do not receive proper advice during the day; (c) Potentially unsafe situations can arise, for instance medical emergencies, alcohol and drug abuse, fire, gun manipulation, etc. As mentioned in Mertens (2003), latchkey children are more likely to enter into risk behaviors like drug and alcohol abuse; (d) The academic efficacy of children can be affected. For instance, in a study reported in Mertens, (2003), academic efficacy is 10% lower in middle grade students who are left home alone for three hours or more compared to students not left home alone. (e) Children can have easy access to “adult” cable TV, and/or adult web sites, and thus can learn inappropriate behaviors; and (f) Teen pregnancy may increase by the fact of being home alone without the proper parental or care-giver control. Robots, together with other mechanisms, such as after-school community programs, could play an important role in avoiding or reducing these situations. As already mentioned, the availability of a robot nanny to interact with children can be very beneficial for them. The robot nanny can provide entertainment, companionship, supervision and educational support (motivation, information, housework support, help with

repetitive exercises, language training, etc.), and even moral advice, although probably not in the near future.

3. Conclusion

In summary, we believe that the use of robots for childcare needs to be regulated and that studies such as the one presented in the paper under analysis present important elements and concepts to be used in the discussion of the specific regulations. We also think that it is very important to analyze carefully the pros and cons of using robots for childcare. In the case of latchkey children, older than five years old, we feel that the use of robots for childcare could be very beneficial.

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