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2 **Why Robot Nannies Probably Won't Do**
3 **Much Psychological Damage**

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8 While the issue of robot child care is obviously of critical importance, an ap-
9 praisal will not benefit either the field or society if it unrealistically exaggerates a
10 threat, any more so than if it unrealistically trivialises danger. Thus while I largely
11 concur with Sharkey and Sharkey (hereafter S&S) on many substantial and im-
12 portant points, I find it necessary to write a commentary critical of their primary
13 outcome.

14 To explain why robots are unlikely to cause significant psychological damage
15 to children, I will begin where S&S end, with the legal framework in which com-
16 mercial child-care robots will be marketed. From this I will look at the likelihood
17 of deception — both commercial deception through advertising and self deception

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1 on the part of parents. Finally I will reexamine the probability of psychological
2 damage to children.

3 I believe that in most respects robot nannies are no greater danger than other
4 artifacts and child-care practices already present in our society. There is however
5 one substantial difference that AI child care and most current child care: AI inter-
6 actions are more reliable and predictable. This may have a negative psychological
7 consequence that S&S have overlooked. Some children may reduce attachment
8 with parents and other interlocutors that are less predictable in favour of their
9 robot. Thus although in the main my commentary argues that S&S are overstating
10 the dangers of robot nannies, I will close with an additional note of caution and
11 some recommended research.

12 **1 Information Will Result from Liability**

13 With respect to the law, I agree with S&S on two very important points. First, it
14 should be dismissed out of hand that the robots should themselves have any liabil-
15 ity. They are just tools owned by parents and marketed by corporations (Bryson,
16 2010). Second, there will need to be codes of practice and possibly legislation to
17 enforce realistic advertising and warn about appropriate use. But in contrast to
18 S&S, I predict that this legislation will come as a result of manufacturers *under-*
19 *selling* the AI and interactive capacities of their robots.

20 The key point of my legal argument is this: no company will want liability
21 for damage to children. As a result, it is extremely unlikely that any robot will
22 be marketed as anything other than a toy or monitoring device. Neither television
23 manufacturers nor broadcasters are liable when children are left for too long in
24 front of their television. Robot corporations will want to be in the same position, so
25 we should be able to communicate this model to them: make your robots reliable,
26 and describe what they do accurately. Then except for the exceptional situation of
27 errors in manufacture that all such device makers are prone to (e.g. parts that come

1 off and choke children) the legal liability will rest entirely with the parent or other
2 responsible adult. As it should, and as it does now.

3 Consequently we can see our primary responsibility as robotics professionals:
4 educating parents on the proper use of robots, and doing research on their impact
5 on children. I predict that just like any other new child-oriented strategy or tech-
6 nology, information on robot nannies will rapidly disseminate through chat shows
7 and mother's magazines. There will be a plethora of theories, articles and received
8 wisdom about the right and wrong way to use robots with children.

9 If anything, what robotics manufacturers should worry about is that robots will
10 be banned due to incredibly rare cases of neglect or misuse. This has happened to
11 several extremely popular children's toys, such as assisted walkers. A very small
12 number of parents did not adequately block the top of in-house stairways, and
13 their children fell down the stairs while in the walkers. Rather than the parents
14 being blamed themselves, the product was rapidly banned. No legislator wants to
15 be associated with dead babies. However, legislative banning is not inevitable. No
16 one has yet banned a much more prevalent cause of child death and injury — au-
17 tomobiles. Automobiles are seen as too critical to our economy and our individual
18 freedom to be banned despite a horrific cost in loss of life and well being, to say
19 nothing of environmental damage. If robotics become as essential to our economy
20 as automobiles, they will also become immune to arbitrary legislative bans.

21 **2 Deception Will Be Largely Self-Imposed**

22 My prediction then is that robots will be sold primarily as toys, surveillance
23 devices, and possibly as household utilities. They will nevertheless be brightly
24 coloured and appealing to both parents and children. Parents will discover the
25 robots (deliberately designed) ability to engage and distract their child. Robotics
26 companies will provide programs geared to parents and children, just as televi-
27 sion broadcasters do (with another meaning of *program*.) But robots will always
28 have disclaimers “This device is not a toy and should only be used with adult su-

1 pervision,” or “This device is provided for entertainment only. It should not be
2 considered educational or to replace responsible supervision.”

3 But parents will notice that they can leave their children with robots, just as
4 they notice that they can leave their children with TVs, dogs and other children.
5 Humans are phenomenal learners and very good at detecting regularities and ex-
6 ploiting affordances. Occasional horror stories will make the news and remind
7 parents of how to use robots responsibly, just as they do now with respect to guns,
8 dogs and wading pools. Similarly, there will be stories of robots saving children
9 in unexpected ways, as there are now with young children and dogs. This will not
10 make people think that robots are generally the right thing to leave your children
11 with, but they will make parents feel that little bit more comfortable — until the
12 next horror story makes the news.

13 If any legislation emerges, it will most likely be requiring warnings about how
14 addictive the technology can be for some children, or as S&S suggest, for maxi-
15 mum recommended time spent per day with a robot of a certain level of engage-
16 ment. However, note that no such legislation has yet been written for televisions
17 or computer games.

18 **3 Psychological Damage (or at Least Change) Will Happen**

19 My main concern with the S&S account is that while focusing on exactly the right
20 issues e.g. liability and attachment, they paint such an extreme story of psycholog-
21 ical damage that they run the risk of making the important parts of their warnings
22 ignored. The vast majority of parents will see how similar robots are to television.
23 As with TV, they will largely ignore published medical guidelines (Vandewater
24 et al., 2007), but they will also not assume that the robot itself will provide suffi-
25 cient care. S&S speculate about how far away a parent can work and still get back
26 to their child “in time” — the answer will be the same as it is now. Robots are
27 much more likely to be used to compliment human care than to replace it. There
28 will always need to be someone responsible near enough to handle emergencies.

1 What may change is how much attention that person can devote to other things, or
2 how many children that person can manage without stress or exhaustion.

3 I have one significant concern with respect to robotic care which S&S don't
4 broach. The one thing that makes robots very different from television and dogs is
5 that they provide interactivity of a very, very reliable sort. This extreme reliability
6 can be partially ameliorated by noisy sensing and artificial affect (Bryson and
7 Tanguy, 2010). But ultimately it will be impossible that children will not detect on
8 some level that their robots are more predictable than humans. My concern is this:
9 that just as television increases the probability that children will have attention
10 deficits, robots may increase the probability that children have bonding issues with
11 their parents and friends. Not all children, but some, will prefer the more reliable
12 style of interaction they find in machines — just as now some prefer the simpler
13 interactions they find with animals or the high-bandwidth, low-risk stimulation
14 they find in books.

15 We know that a child's ability to bond with their parents has long-term impact
16 on their ability to form friendships, romantic relationships and generally integrate
17 with society. Those children who prefer predictable interactions may be setting
18 themselves up for a life-long preference for machines to humans. This is an im-
19 portant possibility to examine, but one that we can already explore experimentally,
20 by looking at children and other people who prefer AI vs. human opponents in on-
21 line gaming.

22 Of course, even if we find a correlation between children who choose to in-
23 teract preferentially with AI and other forms of introverted behaviour, this does
24 not mean necessarily that the AI is bad for the children. Indeed, the AI may be
25 providing stability and comfort that reenforce their sense of self worth. This is a
26 possibility not seriously addressed by S&S. Given how little is known about chil-
27 dren and AI, we should not overlook the possibility that AI companions might be
28 beneficial in unexpected ways. There is a very real chance that protracted experi-

1 ence of AI might in fact enhance a child's understanding of themselves and what
2 it means to be human (Bryson and Kime, 1998).

3 **4 Our Ethical Obligations as Academics**

4 In summary, I have argued that companies will not ultimately over-represent the
5 caring potential of their products, but rather will rapidly converge on under-representing
6 these in an effort to avoid liability. The problem with deception then will be ad-
7 dressable through public education and popular media. Regardless of this, there
8 will be parents who will use and perhaps overuse robots as child minders, but
9 this is not significantly different from the current situation with other artifacts and
10 care mechanisms. Children will be changed by interacting with robots, and indeed
11 probably already are being changed by game AI. We as academics need to look
12 into how and to what extent.

13 In making these arguments I have made a number of predictions about what
14 I consider to be fairly inevitable market outcomes. But even if I am correct that
15 these will be the final state of affairs, that does not mean that we as roboticists
16 have no further ethical obligations. Unfortunately, academic roboticists are some
17 of the leading sources of deception (including self-deception) about the capacities
18 and desired cultural roles of of our robots. We need as individuals to reexamine
19 our goals, the likely outcome of our work and its impact on society.

20 With active engagement with the media and discussions such as the present
21 one, academics can help bring about an accurate understanding of AI and its im-
22 pact on human lives. We can and should accelerate the rate with which our society
23 comes to understand AI. This will in turn help parents, companies and legislators
24 make responsible choices.

Bio

Joanna Bryson holds a first degree in Behavioural Science from Chicago, Masters degrees in Artificial Intelligence and Psychology from Edinburgh, and a PhD in Computer Science from MIT, where she worked on action selection for cognitive systems in the Artificial Intelligence Laboratory. She has held research positions at the Primate Cognitive Neuroscience Laboratory at Harvard and the Human Communication Research Centre in Edinburgh. Since 2002 she has been at Bath, where she founded Artificial Models of Natural Intelligence. She has been publishing on the topic of AI, human society and ethics since 1998.

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