

The Paro seal robot: demeaning or enabling?

Amanda Sharkey¹ and Natalie Wood²

Abstract. The Paro seal robot resembles a baby harp seal, and has been designed as a therapeutic robot for use with older people, particularly those with dementia. Its behaviours encourage nurturing behaviour: it has an appealing face, cries out like a seal, and responds to stroking (or hitting). In this paper, claims about the positive effects that the seal robot has on the health and well being of those who interact with it are considered. So too are the objections that have been raised about its use: that it could lead to reduced social contact, and that its use involves the deception, and infantilisation of vulnerable older people, and that it negatively affects their dignity. The benefits and costs associated with the robot are considered in the context of the Capability Account [1] which provides an account of what is required for a life worthy of human dignity.

1 INTRODUCTION

The Paro seal robot has been licensed by the US Food and Drug Administration as a Class 2 medical device. Invented by Takanori Shibata, and developed by AIST, the Paro resembles a baby harp seal and is designed as a therapeutic robot for use with older people, particularly those with dementia. Its behaviours are intended to encourage nurturing behaviour: it has an appealing face, cries out for attention, and is covered with fur that is pleasant to touch. Its sensors enable it to respond to being stroked or hit, to recognise if it is being held, and to respond to sound. It can express ‘emotions’ in response to its treatment by moving its tail and body, and blinking its eyes, and it makes seal-like sounds.

Several claims have been made about the positive effects that the Paro robot can have on the health and well-being of those who interact with it. At the same time, strong objections have been raised about the use of such robot pets. In this paper, the intention is to describe and consider the claimed positive benefits, and the objections, and to weigh them up against each other, using the Capability Approach [1] as a framework.

2 POSITIVE EFFECTS

The marketing website for Paro (<http://www.parorobots.com/>) claims that it

- has been found to reduce the stress of patients and their caregivers
- stimulates interaction between patients and caregivers

- has been shown to have a Psychological effect on patients, improving their relaxation and motivation
- improves the socialisation of patients with each other and with caregiver”

and that it can allow the benefits of animal therapy to be made available to people in environments in which real animals could not be easily accommodated. There are a growing number of studies that present evidence of positive effects of the Paro robot on people with dementia, and for older care home residents, and on carers in residential settings.

There are studies that attest to increased social interactions between older care home residents in the presence of a Paro seal. Wada and Shibata [2] used videos and interviews to study the effect of leaving a Paro in an open area in a care home on 12 of its residents. They report increased an increased level of interaction between the residents. Giusti and Marti [3] report an ethnographic study of the interactions between 3 care home residents in the presence of a Paro robot, finding evidence of increased social interaction in the group. Kidd, Taggart and Turkle [4] investigated the effect of regular group sessions with a Paro over several months on 23 residents of two nursing homes. The effect of an activated Paro was compared to an inactivated (switched off) Paro and no Paro, and they concluded that the Paro increased the level of social interaction. There are further anecdotal examples of the Paro robot helping people with dementia to calm down, and of it encouraging social interaction in people previously very withdrawn and depressed. For example, Shibata describes an example of a female resident with mid-stage dementia who had not communicated verbally for over a year. She joined residents around a table with a Paro robot and began stroking it, and speaking about the farm she grew up on and the animals she cared for [5].

Other claims about the beneficial effects of Paro robots include improved communication, and reduced anxiety, depression and agitation [6]. Wada et al [7,8] found evidence of improved well being and increased levels of interaction 23 older women with varying degrees of dementia attending a day service centre where encouraged to interact with a Paro robot. They also report improvements in well-being and a reduction in ‘burn out’ for 6 nursing staff. Some studies have used physiological measures to look at the effects of Paro robots on those who interact with them. Saito et al [9] used measures of hormones in urine to look at changes in stress in older people and nursing staff in a residential health service facility for those who interacted with a full and a modified version of the Paro robot. Wada et al [10] used electroencephalogram analysis (EEG) to investigate the effects of using Paro with people with dementia. They found some evidence of improved neuronal activity in their sample of 14 people.

¹ Dept. of Computer Science, Univ. of Sheffield, S1 4DP, UK. Email: {a.sharkey}@dcs.shef.ac.uk.

² Sheffield Centre for Robotics (SCentRo), Univ. of Sheffield, S1 3JD, UK. Email: {NWood1}@sheffield.ac.uk.

Questions have been raised about the evidential basis for some of these claims. As Mordoch et al [11] point out, several of the papers report research carried out by the inventor of the robot, or by his colleagues, raising some concern about the objectivity of the findings. In recent work, clearer evidence from controlled studies is beginning to emerge. For example, Moyle et al [12] used a randomized crossover design to compare the effect on Quality of Life (and other measures) in people with moderate to severe dementia of group sessions with a Paro to a reading discussion group, and found the Paro to have a significant positive effect. Robinson et al [13] also conducted a randomised controlled trial with 40 older residents of a retirement home who had varying degrees of cognitive impairment. In the Paro intervention group, residents took part in group interaction sessions with the Paro, facilitated by an activities organiser. In the control group, residents undertook alternative organised activities such as bus trips, bingo or crafts. A comparison was also made between the behaviour of the residents when Paro was present, when the resident (living) dog was present, or when neither was present. The results showed a significant decrease in loneliness scores for the Paro group compared to the control group. They also found that residents touched and talked to the Paro more than the resident dog, and also talked more to each other when the Paro was present compared to when the dog, or neither were present.

3 OBJECTIONS

The main objections that have been raised about the use of the Paro robot with vulnerable older people are (i) loss of social contact (ii) deception and (iii) infantilisation. Concerns about the possible loss of, or reduction in, the amount of social contact for older people following the introduction of robot pets were raised by Sparrow and Sparrow [14]. Their argument is that older people are likely to suffer a reduction in the amount of human contact that they experience as more robots are introduced into elder care facilities. They suggest that even the introduction of a floor cleaning robot could result in the loss of social interaction with the human cleaner it replaces.

The accumulating evidence summarised in the preceding section provides a counter argument to some of Sparrow and Sparrow's claims [14]. Although more research is needed, it seems that there is good reason to believe that Paro robots can result in an increased level of social contact for older people in a residential setting, particularly for those with dementia. Empirical and anecdotal evidence suggests that the presence of seal robot on the lap of an older person can encourage other people to talk to them, and that a Paro can foster increased social interactions when encountered in a group. Of course this does depend on skilled and sensitive deployment of the robot; it seems that many of the benefits resulting from its use depend on its deployment in a social setting. It is not clear what benefits would result if an older person were left alone with the robot.

Sparrow and Sparrow [14, 15] also object to robots and robot pets on the basis that they necessarily involve deception. They argue that that any beneficial effects of robot pets or companions are a consequence of deceiving the older person into thinking that the robot pet is something with which they could have a relationship, and are adamant that this should not be encouraged. Sparrow [15] argues that any apparent relationships between

older people and robot pets "are predicated on mistaking, at a conscious or unconscious level, the robot for a real animal. For an individual to benefit significantly from ownership of a robot pet they must systematically delude themselves regarding the real nature of their relation with the animal. It requires sentimentality of a morally deplorable sort. Indulging in such sentimentality violates a (weak) duty that we have to ourselves to apprehend the world accurately. The design and manufacture of these robots is unethical in so far as it presupposes or encourages this", [15]. Wallach and Allen [16] in a discussion of the ability of robots to detect basic human social gestures, and respond with human-like social cues, similarly suggest that, "From a puritanical perspective, all such techniques are arguably forms of deception" [16].

A problem with this argument is that although the Paro is designed to resemble a real animal, the extent to which it necessarily involves deception, or even self-deception, is not quite as clear as Sparrow suggests. As discussed by Sharkey and Sharkey [17], people enjoy anthropomorphising technology. Zizek [18] describes how people can choose to act as though something were real, "I know very well that this is just an inanimate object, but none the less I act as if I believe that this is a living being". Similarly, people often behave as though their cars or their computers were alive, cajoling them to work, or castigating them when they go wrong.

Admittedly it is possible that older people and people with dementia could have a greater tendency to anthropomorphise a robot than other people. Epley and colleagues investigated the factors affecting the levels of anthropomorphism a person displays and found a desire for social contact to be a major factor. Epley et al [19] were able to demonstrate that when feelings of loneliness were induced, people were more likely to be anthropomorphic.

However, behaving anthropomorphically towards something does not necessarily mean believing it to be alive. It is possible that people with dementia can enjoy interacting with the Paro seal whilst being aware that it is a machine of some kind, and not a living entity. As Turkle [20] has discussed, (and Melson et al, [21] have demonstrated) robots can be seen neither as being sentient, nor as objects, but as falling "betwixt and between" known categories. Although the Paro robot resembles a real baby seal, its machine nature is apparent in its need for recharging, and in the slight whirring noise of its machinery. The mandatory training required for those purchasing the robot from its European distributors emphasises the need to avoid referring to it as a real animal, and suggests that it should instead be presented as a 'seal robot'. Anecdotal observations by the first author of this paper of a man with dementia interacting with the robot led her to the conclusion that although he evidently enjoyed the encounter, and was encouraged by it to talk about pets he had owned, he also understood that it was not a real animal, saying "whoever made you was very clever".

Nonetheless, despite these caveats, the Paro robot could still be said to involve some forms of deception. It can also be objected to on the grounds of infantilisation. Objections about infantilisation have often been raised in the context of people with dementia. For instance, although doll therapy can create

positive effects in vulnerable people, it can be objected to as treating them like children. Similarly it could be argued that encouraging vulnerable older people to interact with a robot seal is both deceptive, since the robot is only artificially responding like a pet, demeaning and infantilising.

Cayton [22] held doll therapy to be deceit. Mackenzie *et al* [23] and James *et al* [24] report that some carers, some visiting relatives, and some fellow residents, saw the doll therapy as demeaning, patronising and inappropriate. It would be useful to establish the extent to which the same is true of the Paro seal robot. If a person with dementia blows kisses to a Paro and talks to it as if it were a pet, does that demean them in the eyes of others? Further empirical work is needed here, but it is possible that the seal robot might be viewed more positively than dolls. Partly because it is a robot and people tend to be interested in robots. Also, the Paro robot seems to invoke a more genuinely positive response in most adults. And finally because, unlike dolls, robot seals were not available as childhood toys to current adults and so they do not have the childish connotations that dolls have.

4 DIGNITY AND THE CAPABILITY APPROACH

Objections about infantilisation and deception are related to the concept of dignity. Concerns are often expressed about the importance of maintaining the dignity of people as they age. Encouraging older people to interact with the Paro could be seen as having a negative impact on their dignity. However, there is a certain lack of clarity and agreement about what the term ‘dignity’ actually means. There is advice about the maintenance of dignity in reports such as the 2012 National Pensioners Dignity Code, but there are contradictions in the way the term is used. For instance, is dignity something that is intrinsic to all human beings, or is it something that can be diminished by poor treatment? Nordenfelt [25] refers to the paradox in the classical example of the concentration camp, in which prisoners are considered to be degraded and ‘robbed of their dignity’ by the inhuman treatment they received. At the same time, it is generally recognised that everyone is of equal value and has an inviolable dignity that cannot be taken away. One way of resolving these contradictions is to identify further forms of dignity that, unlike the intrinsic inviolable dignity of all people, can be affected by their behaviour and treatment by others [26].

The Capability Approach (CA) [1] [27] provides a valuable perspective on dignity that can be used to identify some of the benefits and risks that could result from the introduction of Paro robots. The CA has been made use of by a number of writers on robot ethics [28-30]. It focuses on social justice and on the provision of an account of what is needed for a life worthy of human dignity. According to the approach, a dignified life requires achieving a threshold level for a set of 10 core capabilities, which equate to the opportunities a person has ‘to be and to do’ (see following Table for a list of the capabilities). Related to human rights, these capabilities vary from the capability of Bodily Health, to the capability of Attachment. A distinction is made in the CA between capabilities and functioning, because the approach stresses the freedom to choose. For example, a person who is starving and a person

who is fasting have the same type of *functioning* with respect to nutrition, they do not have the same *capability*, because in contrast to the person fasting, the starving person has no access to food, and no choice about whether or not to eat.

The CA is intended to apply to all human beings, including those with cognitive disabilities. Nussbaum’s argument [1] is that the goal of social justice is to ensure that all humans achieve a threshold level of all the core capabilities; pointing out that this will require further investment, cost and help for those with physical and cognitive disabilities.

The CA provides a perspective from which it possible to see how companion and pet robots like the Paro could expand the set of capabilities available to vulnerable older persons. As reviewed above, there is evidence that the Paro could act as a social facilitator and encourage social interaction between a person with dementia and the human beings around them. As such they can be viewed as promoting access to the capability of (7) *Affiliation* (see the following table for the numbered list) by creating more opportunities to engage in social interaction.

The Paro robots are designed to encourage nurturing behaviour. As such, they can be viewed as offering increased opportunities for having attachments to things and people outside ourselves (5 *Emotions*). As discussed earlier, there is evidence that interacting with the robots can result in a reduction in stress and anxiety. The seal robots could also be seen as promoting, or increasing access to the capability of Play (9 *Play*) since they can provide the opportunity to ‘laugh, to play, to enjoy recreational activities’. It is also possible that interacting with the Paro could result in improved health (2 *Bodily Health*).

At the same time, the risk that a robot pet such as the Paro could result in some loss of apparent dignity can also be captured within the CA, if it were seen to interfere with the capability of having the social bases of self-respect and non-humiliation (7 *Affiliation B*). If playing with the seal robot was all that was available as an activity, a neglected person might do so, but feel humiliated as a result. It is also possible, as previously mentioned, that the family members of those with dementia might consider that their relative was suffering some form of humiliation by being given a robot pet to interact with. Poorly trained care workers might make fun of someone interacting with a seal robot.

Nonetheless, considering the Paro robot in the context of the CA makes it possible to identify ways in which it could increase the access of people with dementia to a number of capabilities. The benefits that it offers are likely to be especially important for those with dementia or other cognitive impairments that make regular social interactions with other people more difficult.

It could be argued that the combined risks of humiliation, loss of perceived dignity and deception could be avoided if real animals were made available rather than using a fake robot animal. Indeed, one of the core capabilities refers to the opportunity to be able ‘to live with concern for and in relation to animals, plants and the world of nature’ (9 *Other species*). However, the Paro was originally developed to offer the benefits of animal-assisted therapy in situations where real animals could not readily be

1. *Life*. Being able to live to the end of a life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.
2. *Bodily health*. Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.
3. *Bodily integrity*. Being able to move freely from place to place; to be secure against violent assault, including sexual assault and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.
4. *Senses, imagination, and thought*. Being able to use the senses, to imagine, think and reason – and to do these things in a “truly human” way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing works and events of one's own choice, religious, literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to have pleasurable experiences and to avoid non-beneficial pain.
5. *Emotions*. Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development).
6. *Practical reason*. Being able to form a conception of the good and to engage in critical reflection about the planning of one's life.
7. *Affiliation*. (A) Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another. (B) Having the social bases of self-respect and nonhumiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of non-discrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, national origin.
8. *Other species*. Being able to live with concern for and in relation to animals, plants and the world of nature.
9. *Play*. Being able to laugh, to play, to enjoy recreational activities.
10. *Control over one's environment*. (A) Political. (B) Material

Table 1: Nussbaum's 10 central capabilities [1]

accommodated. In addition, a problem with real animals such as cats or dogs is that they have their own agenda, and will not necessarily agree to sit on someone's lap on demand, or for very long. Our intuition is that the very simplicity of the Paro robot is itself a strength for someone with dementia – it makes minimal demands, and appears to respond appreciatively simply to being touched and stroked. A real squirming cat with claws will not always be so accommodating

5 CONCLUSIONS

Ultimately, there are reasons to expect the Paro robots to offer some benefits to vulnerable older people, but there are also some risks. The risks include the involvement of some forms of deception, and the possibility that some people might view the robot as having a demeaning effect and as creating a perceived reduction in dignity (although more evidence on this point is needed). At the same time, a consideration of the robot's effects in the context of the Capability Approach make it possible to identify ways in which it could be seen as enabling because it can increase the access of people with cognitive impairments to a wider range of capabilities than would otherwise be possible. At the present moment, the likely benefits could be seen as justification for the risks. In the future, if the balance of the evidence tips more decisively towards the positive benefits of the Paro, it could even be argued that they *should* be made available to those people with dementia likely to benefit from them.

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