What asking potential users about ethical values adds to our understanding of an ethical framework for social robots for older people.

Heather Draper[1], Tom Sorell[2], Sandra Bedaf[3] Christina Gutierrez Ruiz[4], Hagen Lehmann[5], Michael Hervé[4], Gert Jan Gelderblom[3], Kerstin Dautenhahn[5] and Farshid Amirabdollahian[5]

Abstract. This paper reports and discusses empirical research on the ethical principles that should inform interactions between social robots and their users who are older people. Data were collected from focus groups composed of older people in France, the Netherlands and UK, as part of the Acceptable Robotic Companions for Ageing Years (ACCOMPANY) project. In this paper we report and discuss the implications of some of the results of these focus groups for the design, programme and practical use of social robots.

1 INTRODUCTION

The aim of Acceptable Robotic Companions for Ageing Years (ACCOMPANY) is to develop a robotic companion within a 'smart home' environment, so as to facilitate independent living for older people. ACCOMPANY uses the Care-O-bot® 3 robot platform (pictured below) .It is being developed to provide physical, cognitive and social help in the home, and to enable the householder to perform household tasks and care for him/herself. It is also intended to co-learn with the householder. The aim is to produce a companion robot that is socially interactive, acceptable and capable of empathic interaction, building on computational models of robot social cognition and interaction.

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[1] MESH, Health & Population Sciences, University of Birmingham, B15 2TT, UK Email: h.draper@bham.ac.uk CORRESPONDING AUTHOR
[2] PAIS, University of Warwick, CV4 7AL, UK Email: t.e.sorell@warwick.ac.uk
[3] Hogeschool Zuyd, 300 6419 DJ Heerlen, NL Email: sandra.bedaf@zuyd.nl; gertjan.gelderblom@zuyd.nl
[4] Centre Expert en Technologies et Services pour le Maintien en Autonomie à Domicile des Personnes Agées, 10430 Rosières Près Troyes, FR Email carolina.gutierrezruiz@madopa.fr; herve.michel@madopa.fr
[5] School of Computer Science, University of Hertfordshire, AL10 9AB, UK. Email: hagen.lehmann@gmail.com; k.dautenhahn@herts.ac.uk ; f.amirabdollahian2@herts.ac.uk

The target user-group for ACCOMPANY is older people who need some additional support to remain independent in their own homes, but whose care needs are not extensive and who do not have any significant cognitive impairment.

ACCOMPANY is designed to interact not only older householders, but their informal and formal carers. ACCOMPANY also has a significant ethics component, which is producing an ethical framework to guide the design of social robots capable of playing a care role. A tentative framework was produced, based on some relevant philosophical considerations and background philosophical literature[1]. This framework proposed autonomy, independence, enablement, safety and social connectedness as central values. It was clear, however, that there would inevitably be tensions in practice between these values, and the authors wanted to determine how potential stakeholders would regard the tensions, and whether there were other values that they might wish to have considered in the design and use of a social robot. Accordingly, the ACCOMPANY user panels were consulted. The method used for this consultation is outlined in section 2. In section 3 we report some of the results of the focus groups run with older people. In section 4 we outline some of the potential implications of these results for framing the ethical values for designing social robots.

2 METHOD

Scenarios (Table 1) were generated that were informed by previous work in ACCOMPANY on the ethical values that should govern the use of social robots [1]. The proposed values (autonomy, independence, enablement, safety and social connectedness) may conflict in some situations – captured by the scenarios – and focus groups were asked questions relevant to the resolution of these conflicts.

Scenario	Brief description
1: Marie	Enablement being autonomously resisted, privacy and disclosure to a healthcare professional involved in care
2. Frank	Autonomy and resistance to possibility of social connectedness afforded by online resources
3. Nina	Enabling politeness in human-human interactions by encouraging politeness to the robot
4. Louis	Autonomy in tension with safety in relation to falls (he doesn't want people alerted to his falls) and life-style choices (he likes to gamble online)

Table 1 Brief description of scenarios

A topic guide was designed to ensure that focus groups run in different countries and with different facilitators would be both open and fairly consistent. The focus groups were conducted using the native languages of the French, Dutch and UK participants. A significant challenge for the research team was to conduct a piece of qualitative research in three different languages to be written up in English while still capturing the linguistic nuances present in the non-English transcripts. Another challenge was to take account of the influence of differences in provision and funding of care in each of the countries in which data were collected.

All focus group sessions were audio-recorded and transcribed. A representative transcription of each group (older persons, informal and formal carers) in the Netherlands and France were translated into English. These, together with samples from the two centres in the UK, were analysed independently by two team members (Draper & Sorell), and the resulting themes discussed until agreement was reached. The results were then shared with the rest of the team who had run focus groups (Bedaf, Gutierrez Ruiz, Lehmann, Hervé) to ensure that there was a shared understanding of the analysis process and themes that seemed to be emerging from the data. The remaining original language transcriptions were then independently analysed with a view to confirming initial themes and finding new themes that may not have been reflected in the sample translations. Illustrations were drawn from the transcripts and translated into English.

21 focus groups were convened comprising a total of 123 participants (see Table 2).

Type Country	Older people	Informal carers*	Formal Carers*
France (MadoPA)	3 (7,8,4)	3 (7,5,3)	3 (7,7,4)
Netherlands (Zuyd)	2 (7,3)	2 (6,5)	2 (6,8)
UK (UH&UB)	4 (5,7,7,7)	1 (4)	1 (6)
Totals	**9 (55)**	**6 (30)**	**6(38)**
*The results of these groups will not be reported in this paper			

Table 2. Number, type of and countries where groups were conducted (with numbers of participants in brackets).

3 RESULTS

The most prominent themes to emerge from the older people's groups and their inter-relatedness are represented in Figure 1.
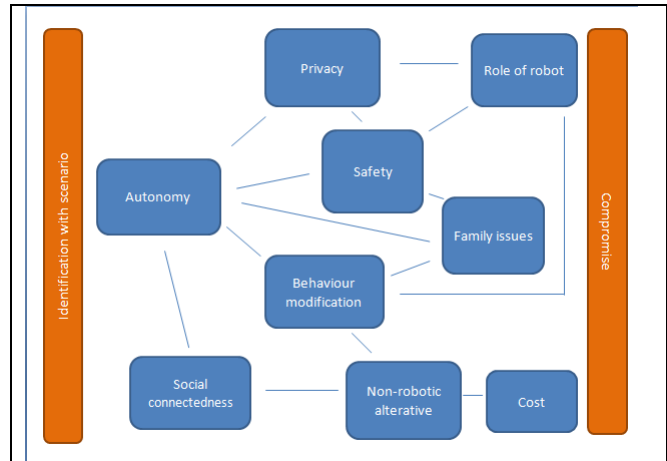

Figure 1. Mind map of emerging themes for the older people focus groups

The interrelatedness of the themes is important to note. For instance, the participants' views about autonomy were connected to their views about e.g. family involvement, potential harms the householder could experience, and the way in which they conceptualised the robot (e.g. as a servant or extension of the healthcare professional). In reporting our results we have attempted to give a sense of the interrelatedness of the views expressed whilst simultaneously trying to avoid repetition.

The participants related well to the scenarios, commenting on how realistic they thought they were in portraying their own attitudes, and the behaviour of older people they knew, or had cared for.

I'm also such a person, so I can tell you that I don't always do what they tell me to do. (ZUYD OPFG 2 E3)

...a neighbour of mine who's just died she fitted that scenario...she was rude to her carers, so they left. She was rude to her daughters, had her daughters in tears, and yet she was fine with everybody else. (UoB OPFG1 P6)

The participants were also keen to try to resolve the tensions portrayed in the scenarios through a process of problem-solving. That is, the participants did have a sense that some values were more important than others, but they often tried to suggest compromises that would give some weight to values that may otherwise be overridden.

Yes, if necessary you could program the robot different during the evening, so you still have the time to watch something. Or that you could indicate: "I want to watch this and we can walk over 1,5 hours." (ZUYD OPFG1 E7)

If it [the robot] *couldn't* [get her a hot drink], *she could have a little flask, I mean the robot could carry a little flask and then just take the top off* (UH OPFG P1)

Predictably, the participants did not use the term 'autonomy' (or other kinds of recognisable philosophical terminology) but they spoke frequently about respecting the views of the householders

in the scenarios, or respecting their wishes, or about its being a householder's life, or that the householders should have control over what happened to them, or that they should not be treated like a child. We agreed to draw all of these kinds of references under the general theme of autonomy.

> *Elderly people still have their personal freedom and if they say no it should be no, shouldn't it?* (MaDOPA OPFG1 P1)

> *No I don't think a robot should be able to treat somebody as if they're a naughty child... Not somebody of seventy, no* (UoB OPFG1 P6)

Our participants often gave considerable weight to the autonomy of the person into whose home and for whose benefit the robot was being introduced (i.e. the householder). They tended to take for granted that the robot had been introduced into a home with the householder's agreement, and that the householder's views should be respected. There was often a strong – but not unconditional – sense that the householders should be able to live their lives as they wanted to, even where others did not agree with the choices made, and sometimes even if others were inconvenienced as a result.

> *After all, it's his money, he can do what he wants with it, but he needs to be protected to make sure that afterwards he doesn't have trouble paying his bills and everything else (MaDOPA OPFG1)*

> E3*: No* [the daughter should not be allowed to programme the robot]. *You should still respect the opinion of that person. I really think that.*
> R1*: Even if Frank really enjoys the internet after a while?*
> E3*: Yes but you can always show it, but he... Yes...* [silence] *I still think the person himself... You should not ignore his opinion.* (ZUYD OPFG1)

> *She ought to be involved in the programming. That if they said to her 'You tell us how, what you want to say' and they programme it in the way she asks for it to be programmed rather than giving her a programme* (UoB OPFG3 P7)

The participants did not assume that all potential householders would necessarily be autonomous. Some referred, for instance, to people in the scenarios as being of 'sound mind', or not suffering from conditions they associated with mental deteriorations.

> *...with these none of them* [people in the scenarios] *have dementia or going that way when they can't make a decision. They're all of sound mind to make their own decisions* (UoB OPFG1 P2)

> *...it is up to him what he does with his money... as long as he is not mentally ill in any way it's his choice* (UH OPFG P1)

Although the participants rated autonomy highly, they tended to distinguish between persuasion and the undermining of autonomy. In the scenario of Frank especially, many participants tended to think that it was acceptable to put him under some pressure (or to re-programme the robot so as to encourage him) to try to use an online fishing forum to achieve more social connectedness. We might regard these views as expressing some agreement with autonomy-promoting paternalism.

Experience it. If he still doesn't like it after a couple of times it's fine. That they should change to program back. (ZUYD OPFG1 E5)

> *It doesn't mean that he's got to use it, she* [the daughter] *can just put the programme there for him and maybe he uses it of his own accord. Is that not right? She's not forcing him to do it, it's just if she can just manipulate it and add that to what he's already got well then he has a choice, maybe when nobody's about he'll have a little play and find it by himself, if he hasn't got it he can't do that. So it's not as if she's interfering she's just adding it to his range of possibilities and it's there – he can either do it or not as he wishes presumably.* (UoB OPFG2 P7)

> *You could pretend you pressed the wrong button on the robot or something and saw it by chance. By the time he's tried to find out what's happened or you tell him the truth, he'll have seen the channel and may well be interested. Sometimes you have to use fair means and foul to change people's minds...* (MaDOPA OPFG1 P4)

At other times they favoured more outright paternalism, privileging safety over autonomy

> *P2: Well I think the Care-o-bot has got to be programmed to alert if he falls.*
> *P1: Yes, serious falls I think because if he got ill, that is a problem.* (UH OPFG)

Some participants drew a distinction between programming or actions that completely prevented the householder from doing something he or she wanted to do, and those which encouraged a certain behaviour without preventing the householder from choosing not to comply. In this respect some distinction was being drawn between strong and weak paternalism.

> *They don't just take something from him. They come with an alternative. Instead of the crutches they give him a walking frame which makes it less likely for him to fall. It's not like they take away him walking.* (ZUYD OPFG1 E7)

Responses to the Nina scenario were mixed. In most of the groups there was at least some support for the view both that Nina could be rude to the robot and that her behaviour was up to her even if either she or her carers/daughter suffered as a result. The focus groups run in the Netherlands tended not to see things this way. Here a much higher value was placed on being polite – even to the robot – though this was not a unanimously held view, and there was much more acceptance of programming the robot so as to encourage Nina to behave more politely. Elsewhere, there was some, but not unanimous, resistance to using the robot to modify Nina's behaviour, though all groups tended to think that programming the robot to help people to remember things, for instance to take medication, was a good thing.

> *Personally I'm not sure that the robot should act like that. Basically it's there to help her, she lives with it. If her daughter doesn't like it, she can just visit her mother less often.* (MaDOPA OPFG1P3)

> *I think if you put yourself in this position, if you can imagine if you have a machine in your house to which you must say please and thank you like a three year old, y'know and its gonna say* [talking like a parent to their child] *'What's the magic word?' before it*

gives you a cup of tea or something that's infantilising (UoB OPFG3 P6)

But I don't think the robot should be reprogrammed to do whatever Nina wants. She could be a bit nicer, even though it is a machine. I think you still need to be polite. (ZUYD OPFG1 E3)

Co-operating with the robot when it was trying to fulfil a therapeutic function was generally regarded as being something that the householder should try to do. Participants were sympathetic to Maria's reluctance to walk around, because this was uncomfortable for her to do, but at the same time some participants thought that in agreeing to have the robot in the home, the householder had agreed to work with the robot to get better.

I'm assuming that this isn't forced on her she agreed to have a robot, so stay at home and have a robot rather than sort of saying 'Right, if you don't have it you have got to go to care' so it's not something she has got to have. It's something that she makes the choice to have the robot and I think you made that choice she has got to pay a little attention to it even if it is a robot. (UH OPFG P2)

E1: Yes, and you should participate."
E3: Indeed participate… You have that thing in your home to receive help. And you should stick to it (ZUYD OPFG2)

Thus, on the question of whether robots should enable a change of behaviour, views tended to differ according to the type of behaviour in question: reminders to do something were generally regarded as useful, whereas altering characteristic behaviour was not. Perhaps this difference is due to the fact that reminders are very familiar forms of help, and sometimes self-help, and that when they are provided by machines or even people, they facilitate the execution of, rather than determine, a person's plans.

Attitudes to householders being obliged to co-operate with the robot to improve their health were more mixed. This may in part have been due to the way in which the scenarios were designed, but also to the participants' concept of what the robot was for (servant or extension of the care provider, especially professionals, but also informal carers and family members). Attitudes also connected to notions of privacy. Some participants tended to think that it was acceptable for healthcare professionals to have access to data collected by the robots.

If she really does have to get up and walk around, the robot will have to keep saying things like "Come on, we're going for a walk!!" just like a nurse or a physiotherapist would (MoDOPA OPFG1 P4)

I would feel comfortable about a robot recording the actual amounts of movements that was being done and to report back to somebody for them to then do something about it and issue their discretion I think that would be fine (UoB OPFG 2 P2)

…it is a bit like the nurse coming in and saying 'Shall we have a game of poker?' isn't it. And you wouldn't expect that (UoBOPFG3 P7)

Safety was also a consideration. Participants were concerned in the case of Nina that she could come to harm if the robot refused to do something asked of it, and in the case of Louis some participants thought that the robot should disregard his wishes

about having his falls disregarded if he had fallen and lain for some time. Views about Louis coming to financial harm as a result of gambling were more mixed, with many participants voicing the view that his money was his own to enjoy as he wanted and others concerned that he could be left badly off as a result of his gambling, and feeling that this could justify some limits being placed on his gambling, or even on his access to the gambling site.

Many participants were sceptical about whether a robot could be a companion in the sense of providing them with company. In response to all of the scenarios, the participants either wanted or assumed that human contact would also be available. Being socially connected and having human contact was regarded as important.

I'm alone the whole day for over 8 years now. And you can't replace that empty hole. Also not with a robot. (ZUDY OPFG1 E2)

4 DISCUSSION

We have been unable in the space provided by this paper to elaborate on all of the rich data that we have collected from the older people who participated in our focus groups. And we have not referred at all in this paper to the data collected from formal and informal carers. Nonetheless, even this brief exploration of one of the data sets suggests several interesting avenues for exploration in terms of the design/programming of social robots.

The need for the robot to have some default safety features (e.g. in relation to summoning help in the event of a fall) seemed to be widely accepted. Although the participants often felt that the householders' decisions should not be resisted by the robot, there was also an assumption that it would be wrong for a robot to fail to respond if the householder was at serious risk of harm, even if this was something that the householder did not want. But there was no clear consensus about what constituted the threshold for a necessary intervention. A couple of participants seem to take it for granted that a robot should not collude in a suicide, for instance, a position that is endorsed by Sharkey and Sharkey [2]. With reference to Louis wanting the robot not to summon help in the event of his falling, participants were sympathetic to the notion that he was entitled to at least try to stand up on his own, but were uncomfortable with the idea that Louis should be able to programme the robot never to summon help even if he was unable to get himself up. There seemed to be a general presumption that if the robot was present it should provide something of a safety net for the householder, whether by summoning a family member or by contacting a central call centre (as with telecare fall alarms). This position was consistent with a more generalised sense of control over the programming of the robot having to be negotiated between the older person living with the robot and that person's other support networks of formal and informal carers. The older person's wishes, though generally regarded as very important, might sometimes be outweighed.

It is significant that at least some participants volunteered the view that where robots were being provided for specific reasons (e.g. enablement) that the older person had agreed to, then the cooperation of the older person with enablement was part of the

agreement. Although the participants generally favoured persuasion over coercion, some also felt that it was consistent with respect for autonomy to expect householders to deliver on their side of the deal. This view is consistent with that discussed elsewhere by Draper & Sorell suggesting that patients do have responsibilities, in particular, to follow through on care that has been voluntarily sought [3]. What requires further consideration, however, is how providers of social robots with e.g. enablement features should enforce the householders' obligation to cooperate with those features.

If the norms of healthcare ethics are applied, householders would have to be provided with the opportunity to refuse continued consent to care. Anyone who really does not want to work with the robot should not therefore be compelled by the robot or anyone else to cooperate. A failure of cooperation could, however, reasonably lead to the robot being withdrawn, regardless of how desirable to the householder other features of living with the robot might be (e.g. its ability to act as a servant to some degree, or even its providing some form of companionship, features that a simpler and less expensive robot might possess). Autonomy is compatible with having difficult decisions to make, and also with accepting the consequences of one's actions. On this basis an otherwise reluctant householder may feel compelled to live with what s/he regards as the less desirable features of the robot in order retain the robot in his/her house so as to be able to keep the features that are valued. Provided that the enablement goals are not unreasonable and were understood in advance, such an outcome falls short of coercion and is compatible with respecting the autonomy of the householder.

Nor should cooperation be regarded as an adaptive preference under these circumstances. It is not that the user decides to settle for less autonomy by tolerating less control over information about e.g. falls or the absence of a veto on connecting with others socially; instead, it is an autonomous choice to accept the advantages of a companion robot alongside some policy-reflecting programming in the robot that goes against the individual grain. In the same way, one might autonomously accept a car, with its advantages, even if there were strings attached, like giving rides to the neighbours.

Accepting the policy-reflecting goals of the robot could also involve the autonomous acceptance of the withdrawal of the robot. One might envisage circumstances where a robot is withdrawn because its presence in the householder's home has achieved the enablement goals that were set for its installation. Loss of the robot in these circumstances is not unfair. It is on a par with returning crutches once a broken leg is mended. Nonetheless, the more generally useful and the more effective a companion the enabling robot is, the more likely it is to be missed by the householder when it is withdrawn. This is especially true of the withdrawal of multi-functioning social robots, which might be missed for their fetching and reminder functions, even their activity prompts are not. Dividing the same functions between different types of less complex robots might provide householders with a greater range of choices, and a more flexible and responsive service.

The potential loss of the robot might act as a deterrent to giving full cooperation with enablement features, since the longer the householder takes to recover independence, the longer he or she can argue that the robot's presence is still necessary.

In short, the process of withdrawing a robot once provided needs to be carefully thought out in advance of its being placed in a home. The householder needs fully to understand and agree the terms under which it is present, as well as having a say in how it is programmed.

Although the programming of robots in the ACCOMPANY context requires negotiation between older people and their formal and informal carers, our data also suggests that at least one approach - the 'let's do it together' strategy – may itself undermine autonomy by (unconsciously, perhaps) infantilising the older person. The ACCOMPANY project tends to treat resistance to the prompts of the robot as occasions for the robot or for carers to insist that they carry out the prompted activity *with* the older person, as if their refusal or reluctance to cooperate was the disguised expression of the need for sympathetic support and companionship in a task. This might be the way to interpret a child's refusal to eat some food that was good for them or to wash or to brush their teeth; but one would need special reasons not to take clear refusal or reluctance in an adult older person as a prima facie expression of an explicit autonomous preference. That is the way a younger adult's reluctance or refusal would normally be taken. The ethical framework in ACCOMPANY as well as the views of the focus group point to the conclusion that the norms of respecting the wishes of younger, able-bodied adulthood should not cease to apply in old age, unless they have been autonomously relaxed.

ACKNOWLEDGEMENTS

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