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Robots and Human Dignity: a consideration of the effects of robot care on the dignity of older people.

Abstract: This paper explores the relationship between dignity and robot care for older people. It highlights the disquiet that is often expressed about failures to maintain the dignity of vulnerable older people, but points out some of the contradictory uses of the word 'dignity'. Certain authors have resolved these contradictions by identifying different senses of dignity; contrasting the inviolable dignity inherent in human life to other forms of dignity which can be present to varying degrees. The Capability Approach (CA) is introduced as a different but tangible account of what it means to live a life worthy of human dignity. It is used here as a framework for the assessment of the possible effects of eldercare robots on human dignity. The CA enables the identification of circumstances in which robots could enhance dignity by expanding the set of capabilities that are accessible to frail older people. At the same time, it is also possible within its framework to identify ways in which robots could have a negative impact, by impeding the access of older people to essential capabilities. It is concluded that the CA has some advantages over other accounts of dignity, but that further work and empirical study is needed in order to adapt it to the particular circumstances and concerns of those in the latter part of their lives.

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An old lady sits alone in her sheltered accommodation stroking her pet robot seal. She has not had any human visitors for days. A humanoid robot enters the room, delivers a tray of food, and leaves after attempting some conversation about the weather, and encouraging her to eat it all up. The old lady sighs, and reluctantly complies with the robot's suggestions. When she finishes eating, she goes back to stroking the pet robot seal: "At least you give my life some meaning" she says, as the robot seal blinks at her with its big eyes, and makes seal-like sounds in response to her ministrations.

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The aim of this paper is to consider the ways in which robot care for older people could impact on their dignity. It is important to undertake such a consideration because of the risk of developing robotic 'solutions' to the problems of aging that result in a reduced rather than in an improved quality of life for older people. We begin by illustrating the growing awareness and concern about the preservation of the dignity of vulnerable people as they age, referring to accounts of the poor treatment that sometimes occurs, and also to official reports relating to dignity and its relevance. However, despite a general recognition of the importance of maintaining the dignity of older people, the concept of dignity itself is not necessarily well understood. An exploration of dignity is undertaken here, in a brief review that highlights the contradictory ways in which the word can be

used, and also the different senses of dignity that have been identified by a number of authors.

The accounts of different forms of dignity that are summarized here serve to demonstrate its multifaceted nature and to clarify some contradictions, but they do not constitute a unified framework ready to be applied to the assessment of the likely effects of robots on people's dignity. The Capability Approach is turned to instead, as an influential and more coherent account of what is required to lead a life 'worthy of human dignity'. According to Nussbaum's version of the Capability Approach (Nussbaum 2000; 2006; 2011), a dignified life requires that a person achieves a threshold level of the 10 central capabilities she identifies. The approach is adopted here for the purposes of assessing the likely impact of robot care on the dignity of older people: identifying ways in which robots might either increase, or reduce older people's access to the central capabilities. Following this assessment, a final section of the paper is used to reflect on the adequacy of the approach for this purpose, identifying its strengths and its weaknesses in this regard.

1. Concerns about the treatment and the dignity of older people

There are many care homes for older people that are staffed by kind and well motivated people who provide good care[1], but unfortunately vulnerable older people are not always treated well by their fellow human beings. Evidence of, and concerns about, poor treatment and its effect on dignity have been reported in the media. An example is a disturbing BBC Panorama program screened in April 2012, which provided documentary evidence of the treatment of Maria Worroll, an older care home resident with Alzheimer's and arthritis. Her daughter installed a hidden camera that recorded incidents in which "care givers" neglected to speak to her as they performed tasks such as washing her, roughly pulled and moved her "like a slab of meat" (Mirror, 23rd April 2012), and even slapped her. The Chief Executive of Social Care Institute for Excellence (SCIE) commented on the program saying that the images in the program were 'shocking and criminal ….Older people who live in care homes deserve dignity and respect' (http://www.scie.org.uk/news/mediareleases/2012/240412.asp). Another highlighted case that refered to the notion of dignity is that of Elaine McDonald, a former ballerina, who had suffered a stroke, but who lost her appeal against a decision to deny her a night-time carer. She objected to the decision: "I have the right to live with dignity ... And for me that means to be able to go to bed knowing that I have the help I need to go to the toilet in the middle of the night" (Mail Online, 7th July 2011). There were also reports in the news of a man with dementia who was visited by 106 different carers in the year before his death. His wife, Jeanette Maitland complained: "the stream of different faces sent by agencies working for the council's social work department contravened her husband Ken's basic human right to dignity" (Cramb, The Telegraph, 19th May 2012).

As well as reports in the media, there have been a number of more official reports and investigations that have raised concerns about the poor treatment of older people in the context of discussions of dignity. In February 2011, the UK Parliamentary and Health Service Ombudsman published '*Care and Compassion?*': a report that looked into National Health Service (NHS) care of older people. The report focused on 10 example cases of poor treatment, including the example of Mrs H, who, aged

[1] A Care Quality Commission report (2012/13) found that 'In around 90% of cases, people were treated with dignity and respect and were receiving care treatment and support that met their needs and was safe.', but that 'in around 10% of cases people received poor quality care'.

88, deaf and partially sighted, was moved by ambulance from hospital to a care home, where she arrived with numerous injuries, soaked in urine and dressed in clothes that were not her own and were held together by paper clips. In response to this report and the disturbing cases it contained, a Commission was established to identify 'what is wrong with the level of dignity in the care of older people' (Delivering Dignity draft report). The Commission was established as part of a joint initiative from the NHS Confederation, Age UK, and the Local Government Association and published its draft report in February 2012. The draft report does not provide an explicit definition of dignified care, but makes several recommendations. These emphasise the need for patient centred care, for recognising the needs and preferences of an older person, for promoting independence, and for listening to and involving the older person's family, friends and carers.

In another initiative to address concerns about the dignity of older people, the National Pensioners Convention (the "campaigning voice of Britain's pensioners") released a Dignity Code in February 2012. The code identifies various practices and actions which are unacceptable to older people and advocates their replacement by others. Unacceptable practices include 'Treating older people as objects or speaking about them in their presence as if they were not there', and 'Being abusive or disrespectful in any way', and 'Using unnecessary medication or restraints'. Behaviours to be encouraged include examples such as 'respect for individuals to make up their own minds', and 'comfort, consideration, inclusion, participation, stimulation and a sense of purpose in all aspects of care.

'Dignity ambassadors' have been appointed by the 'Dignity in care' network, hosted by SCIE (Social care institute for excellence): first, Sir Michael Parkinson, and more recently Dame Joan Bakewell. Parkinson's report on his experiences, includes descriptions of 'incidents he called "inexcusable and downright unacceptable", he told how one woman had written to him saying her mother had been left naked, covered in urine and in full view in a side room at a hospital, while others had complained of patients' use of alarm bells being ignored for so long that they soiled themselves' (Parkinson, 2010).

The disturbing examples of poor treatment described here show that we cannot assume that an older person's dignity will always be preserved when human carers are involved. Could the introduction of robots as carers and companions improve the situation? Some people might think that it would. For instance, they might point out that robots are not going to become tired, stressed and overworked. They might argue that a robot could not be cruel and unkind, and for instance, would not be able to become angry and slap a frail older person. They might suggest that a generous supply of robots capable of assisting vulnerable older people with their toileting and feeding needs would improve their lives and reduce their physical and mental stress. The same robots could be programmed to engage in some conversation and to offer some entertainment.

To counter such suggestions it should be pointed out that current robots are poor substitutes for human company. Robots may not exhibit the worst sides of human behavior, but neither are they capable of real compassion and empathy or understanding. If older people were to be predominantly looked after by robots, and as a consequence were not able to have access to human companionship, many people would consider their lives to be unacceptably impoverished. As well as a socially isolated life being perceived as an impoverished one, social isolation is also known to have health implications; for example, being single and living alone has been shown to be a risk factor for dementia (Fratiglioni et al, 2000). Saczynski et al (2006) found, in a study of 2513 men that

decreased social engagement from midlife to late life was associated with an increased risk of dementia, and Wilson et al (2007) found a link between measures of loneliness and an increased risk of Alzheimer's disease in senior citizens in Chicago studied over a five year period.

There are many reasons to try to ensure that exclusive robot care for older people does not become an option (Sharkey and Sharkey, 2012a, 2012b), but could robots be introduced in ways that had a positive effect on the dignity of their charges? A major challenge to be faced in trying to answer such a question is finding a clear account of what *dignity* actually is. As will become more apparent in the following section, despite the frequent references made to dignity in the context of aging, it turns out to be a complex multifaceted concept that defies simple definition.

2. What is dignity?

The word 'dignity' is used in such a variety of ways that some bioethicists have argued that it is both overused and under-defined. In a provocative article, Macklin (2003) claimed that, despite its frequent invocation in a medical context, dignity means no more than respect for persons and their autonomy, and could be eliminated "*without any loss of content*". A similar point is made by Pinker (2008) in his criticisms of a report commissioned by the President's Council on Bioethics, '*Human Dignity and Bioethics'*. Pinker derides the utility of dignity, and describes it as "*a squishy, subjective notion, hardly up to the heavyweight moral demands assigned to it*" (Pinker, 2008).

Other writers have remarked on the contradictory uses of the word, 'dignity'. Schroeder (2008) points out that in debates about euthanasia, the 'Death with Dignity' campaign appeals to the notion of dignity to support arguments about the right to avoid prolonged end of life suffering, whilst anti-euthanasia groups also base their objections to assisted suicide on the dignity of human life. Thus the idea of dignity is used to support two completely opposed positions. Another contradiction can be found between the idea that every human has dignity, and the notion that some inspiring individuals such as Nelson Mandela exhibit a dignity that is not found in ordinary people.

Similarly, if we believe that all humans have dignity, why is it so often claimed that poor and degrading treatment strips people of their dignity? Nordenfelt (2003) considers the paradox involved in the classical example of the concentration camp, in which the prisoners are degraded, and "robbed of their dignity" by the inhuman treatment they receive. At the same time it is generally recognised that everyone is of equal value, and has a dignity which cannot be taken away. Contradictions or paradoxes such as these seem to lend weight to claims that dignity is a useless concept.

A number of authors have attempted to resolve such contradictions and lack of clear definitions by making distinctions between different forms and uses of the word 'dignity'. Schroeder (2010) for instance identifies five concepts of dignity; Nordenfelt (2004) identifies four; Bostrom (2008) identifies three. All of these authors effectively make a distinction between (a) the inviolable or universal dignity, (*Menschenwűrde*), that is an inherent property of human beings, and which does not depend on their behaviour, their beliefs, or their circumstances, and (b) other forms of dignity which can be held to varying degrees.

Inviolable dignity is just that: it cannot be removed by dint of poor and degrading treatment. It is closely related to the concept of human rights. For instance, the preamble for the 1948 Universal

Declaration of Human Rights states that 'the recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world'. Human rights and inviolable human dignity are closely intertwined. As Schroeder (2012) points out, the inviolable dignity of all humans is often used to justify human rights for all.

In contrast to the human rights related notion of inviolable dignity, the same authors identify other forms of dignity that can be held to varying degrees and that can be affected by the behaviour and beliefs of people. Schroeder terms these 'aspirational dignity', and identifies three different types: (i) aristocratic dignity, whereby outward characteristics indicate rank and position, (ii) comportment dignity, or the "*outwardly displayed quality of a human being who acts in accordance with society's expectations of well-mannered demeanour and bearing*", and (iii) meritorious dignity, a virtue, that may or may not be possessed, or deserved by an individual. Meritorious dignity is shown by those acting in an honourable way, particularly when they do so in adverse conditions. Schroeder bases the notion on the Aristotelian concept of virtue: and argues that 'perfectly dignified beings will display *all* the virtues [wisdom, justice, temperance and courage] including a good sense of self worth' and that such dignity 'cannot possibly be a characteristic of all human beings. In fact, it will be a characteristic of a diminishingly small number of human beings' (Schroeder, 2006 pp 193).

The varieties of aspirational dignity are divided up slightly differently by Nordenfelt and Bostrom. Nordenfelt identifies three types in addition to inviolable human dignity: dignity of merit, dignity of moral or existential stature, and dignity of identity. Bostrom (2008) recognises two: dignity as a quality, and dignity as social status. Although there are subtle differences, some of these distinctions can be mapped on to Schroeder's definitions. Schroeder's aristocratic dignity appears to correspond to Nordenfelt's 'dignity of merit', and Bostrom's 'dignity as social status'. Her 'meritorious dignity' seems to correspond to Nordenfelt's 'dignity of moral or existential stature' and Bostrom's 'dignity as a quality'.

It is less easy to find a corresponding match between Schroeder's varieties of dignity, and Nordenfelt's Dignity of Identity (although there is some overlap with Schroeder's 'comportment dignity'). Dignity of Identity is 'the dignity we attach to ourselves as integrated and autonomous persons, persons with a history and persons with a future with all our relationships with other human beings' (Nordenfelt, 2004 p. 75). In his account, Nordenfelt emphasises the way in which dignity of identity can be affected by the behaviour of others. According to him, it 'can be taken from us by external events, by the acts of other people as well as by injury, illness and old age' (Nordenfelt, 2004). Dignity of identity involves a person's self-respect, and tampering with someone's integrity and autonomy is usually associated with 'a feeling of humiliation or loss of self-respect on his or her part'. As such, the notion of dignity of identity, (proposed by Nordenfelt in the context of a research project on 'Dignity and Older Europeans'), seems particularly pertinent to the topic of robotics and eldercare because of the attention it pays to the individual's experience.

These identifications of different forms of dignity provide some resolution to the contradictory uses of dignity mentioned earlier, and help to explain how a person's dignity can be compromised by poor treatment even though all people possess an inviolable dignity. It is also possible, to a certain extent, to use the different varieties of aspirational dignity to consider the ways in which robot care and companionship might impact the dignity of older people.

First, the form of dignity that Bostrom (2008) refers to as 'dignity as social status' (a form that seems to equate to Nordenfelt's dignity of merit, and Schroeder's aristocratic dignity) seems particularly relevant to older people. Older people can suffer from a loss of social status: in discussions of dignity

in care, the point is often made about the ways in which care staff may demean their dignity by addressing them in an overly familiar manner, or by behaving in an infantilizing and disrespectful manner towards them. Older people may feel they deserve more rather than less respectful treatment as a consequence of being older and more senior than others: expressed concerns in the media and elsewhere suggest that there are many who would agree. In a trivial sense, robots could be designed with the aim of positively influencing this form of dignity. They could be programmed to address older people in a respectful manner: to be polite and to accept commands, thereby potentially increasing their experience of 'dignity as social status'. At the same time, the actual effect of such robot behaviour is unknown: it is possible that the way in which a robot addresses an older person would have a minimal impact on their feelings of dignity, and that only the behavior of people matters in this respect.

Of the forms of dignity that have been discussed here, the one that seems most important in the context of robots for elder care is a person's Dignity of Identity. Since someone's Dignity of Identity can be changed by their treatment, it follows that the insensitive use of robots in elder care could create feelings of humiliation and a loss of self respect in the recipients of that treatment. For instance, a robot that moved a person without their permission and as if they were an object, could impact on their feelings of dignity. Similarly, a robot that dealt impersonally with an older person, without knowing or using their name or their preferences would also be likely to negatively affect their feelings of dignity. At the same time, the reverse might also be possible: the careful use of robots in care could result in an increase in a person's self respect, for instance by improving their feeling of control over the environment and reducing their dependence on other people, or by using stored knowledge of their previous life and preferences in order to customize their attentions.

Comportment dignity, the "outwardly displayed quality of a human being who acts in accordance with society's expectations of well-mannered demeanour and bearing", could also be affected by robot behaviour. A robot could have a negative effect on the appearance of dignity in an older person. For instance, a robot that transported a person by carrying them like a baby, or a robot pet that encouraged an older person to interact with it in a child-like way, could affect their comportment dignity. A robot might also be able to positively affect comportment dignity if it was successfully used to help to keep an older person dressed, and groomed in an appropriate way. A robot's effect on the comportment, or appearance of an older person could influence their experience of dignity and self respect, in manner that reinforces the overlap suggested here between comportment and dignity of identity. Perhaps comportment dignity should be seen as a component, or a contributing factor, to a person's Dignity of Identity.

These discussions, and the identifications of different forms of dignity, do shed more light on the concept. Although the term is often used in conflicting ways, the important and clarifying distinction between the inviolable dignity of all humans, and the forms of aspirational, or variable dignity helps to resolve the confusion. In addition, it is possible, as seen above, to use the forms of dignity described here to consider some of the different ways in which robots could impact on the dignity of older people. In particular, robots could negatively (or positively) impact on people's dignity of identity, and on their feelings of self respect or of humiliation. There is also the possibility that robot interventions that affected a person's comportment dignity, or outward appearance, could thereby affect the attitudes and behaviours of other people towards that person. That in turn could affect their subjective feelings of dignity.

As in this example, several of the different forms of aspirational dignity considered here do seem to implicitly refer to the subjective internal states of humans, and their experienced feelings of dignity, or its absence. However, although they inspire interesting questions about the psychological determinants of the subjective experience of dignity, these descriptions and definitions of dignity do

not provide a full account of them. The relationships and overlaps between the different forms of dignity are also not entirely clear. For instance, there seems to be some overlap between comportment dignity and Dignity of Identity, and between dignity as social status and Dignity of Identity. In the future, further empirical study could be usefully undertaken to elucidate the distinguishing characteristics of these categories or types of dignity, and the extent to which they should be viewed as distinct from each other. In the meantime, it is concluded that the picture of dignity that emerges from these analyses is not entirely coherent, and does not form a sufficiently clear basis for the evaluation of the effects of robots on the dignity of older people.

The Capability Approach (CA) offers an alternative, and apparently more unified account of dignity. It is to this that we now turn. As will become apparent, the Capability Approach provides an account which places less weight on the subjective internal manifestations of dignity, and more on the opportunities offered to individuals.

2.1 The Capability Approach

The Capability Approach (CA) provides a different and arguably more comprehensive perspective on human dignity than is offered by the definitions we have been considering so far. The CA has been made use of by a number of writers on robot ethics (Borenstein and Pearson, 2010; Coeckelberg, 2010; Vallor, 2011). It focuses on social justice, and on the provision of an account of what is needed for a life worthy of human dignity (Nussbaum, 2000, 2006, 2011; Sen, 1999). Its roots lie in welfare economics, and it is increasingly influential in policy. From 1990, it formed the basis of the Human Development Index, which replaced the use of GDP (Gross Domestic Product per capita), as a means of measuring progress in the United Nations Development programme.

The CA is related to the notion of inviolable dignity, or *Menschenwűrde*, as discussed above, and is closely linked to human rights. Nussbaum (2006) writes, 'Indeed the capabilities approach is, in my view, one species of a human rights approach, and human rights have often been linked in a similar way to the idea of human dignity'. One of the great strengths of the Capability Approach, particularly as articulated by Nussbaum (2000, 2006, 2011), is the way in which it provides a specific account of what is needed for a life worthy of dignity. The emphasis in the CA is on what an individual is able '*to be and to do*' and on creating an environment that offers everyone opportunities for such essentials as health, and affiliation to others, whilst emphasising the individual's freedom to choose which opportunities to realise. Nussbaum's version (*ibid*), on which we concentrate here, employs a specific list of 10 central capabilities (see Table 1). Achieving a threshold level in all the central capabilities is held to be necessary for a life with dignity.

Capabilities are, "the answers to the question, '*What is this person able to do and to be*?'" (Nussbaum, 2011, pp 20). An individual's set of 'combined capabilities' are the set of opportunities they have for choice and action in their specific situation. A distinction is made between capabilities and functionings, because the approach stresses the freedom to choose. Thus a person with a specific *capability* may choose not to realise it as a *functioning*. Nussbaum uses an example of Sen's to explain the difference: 'a person who is starving and a person who is fasting have the same type of functioning where nutrition is concerned, but they do not have the same capability, because the person who fasts is able not to fast, and the starving person has no choice' (Nussbaum, 2011 pp 25).

Box 1: Nussbaum's 10 central capabilities

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 recognise 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. Being able to participate effectively in political choices that govern one's life; having the right of political participation, protections of free speech and association. (B) Material. Being able to hold property (both land and movable goods) and having property rights on an equal basis with others; having the right to seek employment on an equal basis with others; having the freedom from unwarranted search and seizure. In work, being able to work as a human being, exercising practical reason and entering into meaningful relationships of mutual recognition with other workers.

Although Nussbaum's formulations of central capabilities are closely related to human rights, she holds that they have certain advantages over standard rights accounts. Nussbaum claims that the CA articulates the relationship between human rights and human dignity more clearly than other rights accounts (Nussbaum, *ibid*), since the central capabilities are defined in part in terms of dignity. A further strength of the CA is that it grounds rights claims in 'human birth and minimal agency, not in rationality or any other specific property' (ibid). This means that it is intended to apply to all human beings, including those with cognitive disabilities. This circumvents problems identified by Schroeder (2012) that arise as a result of relying on Kantian and Christian justifications for human dignity. Christian doctrine affords dignity to all individuals whatever the circumstances, but it is grounded in religious belief, and as such less relevant to an increasingly secular world. Kantian dignity does not afford dignity to all. Dignity is assumed to be the property of those beings with a capacity for rationality: an assumption that leads to some problems when considering humans with severely diminished capacities for reasoning, such as those with late stage dementia (Schroeder, 2010).

Nussbaum (2006) explicitly discusses the 'unsolved' question of disability in the context of the CA. Her argument is that the goal of social justice should be to ensure that all humans achieve a threshold level of all of the capabilities; pointing out that this will require further investment, cost, and help, for those with physical and cognitive disabilities. She argues that the target set of threshold capabilities still applies to those with disability, and that efforts should be made to help them achieve them. For those with severe mental disabilities, Nussbaum acknowledges that although they have needs in all the areas covered by the capabilities, how these are achieved will depend on the nature of the person's impairment. She writes that 'good care for a person with a mental impairment (including older people with dementia or Alzheimer's) is individualised care' (2006, pp 170). Nonetheless, she does not advocate a reduced list, arguing that it is too easy to assume that certain capabilities cannot be achieved when in fact they could. For example, it used to be assumed that 'a person who was blind or deaf couldn't participate in higher education, that a person in a wheelchair could not participate in sports or perform in a wide range of jobs' (2006, p 188). Such assumptions she claims offer an easy way of getting off the hook and avoiding the difficult task of finding ways to help disadvantaged people to gain access to the full range of capabilities.

The capability approach has a conceptual heritage that can be traced back to Aristotle's virtue ethics. It has a close relationship to John Rawls and contractarianism, although Nussbaum (2006) explains that it is based on an outcome oriented conception of justice, as opposed to the procedural account given by Rawls' contractarianism. The CA starts with an intended correct outcome, and attempts to design procedures that will achieve that outcome, whereas Rawls is concerned to design 'a procedure that models certain key features of fairness and impartiality, and relies on these procedures to generate an adequately just outcome' (Nussbaum, 2006 pp 81). Nussbaum suggests that the CA can be viewed as 'an extension of or complement to Rawls' theory' (Nussbaum, 2006 p 69).

The approach also bears some relation to Utilitarian approaches to social justice. However, it places less emphasis on the happiness or satisfaction of individuals than is the case in Utilitarian theory. The main reason given for this is the phenomenon of *adaptive preferences,* whereby people who live in unjust and restricted circumstances may learn to accept, and even to prefer them. As Nussbaum (2006, p 73) explains, 'people adjust their preferences to what they think they can achieve, and also to what their society tells them a suitable achievement is for someone like them'. Thus there are some problems in a Utilitarian focus on the state of satisfaction or happiness which the Capability Approach avoids.

How does the CA relate to the forms of dignity outlined before? As already indicated it incorporates the notion of inviolable dignity or *Menschenwűrde*, since it is assumed to apply to all human beings regardless of their mental or physical capacity. However there isn't a clear mapping between the forms of aspirational dignity and the list of central capabilities. For instance Dignity of merit (or social status) has no obvious parallel in the list of central capabilities, and none of the central capabilities seem to relate to the idea of meritorious dignity. However there are some resemblances to Nordenfelt's Dignity of Identity: in particular it resembles (*7) Affiliation (B*) where 'Having the social basis of self-respect and nonhumiliation; being able to be treated as a dignified human being whose worth is equal to others' refers to the internal experience and feeling of dignity.

The CA can also be related to some aspects of the dignified treatment advocated by the reports on dignity in care described earlier. For example, the National Pensioners' Dignity code calls for 'comfort, consideration, inclusion, participation, stimulation and a sense of purpose in all aspects of care", and "respect for individuals to make up their own minds'. These points could be mapped on to several of the capabilities, including (6) *Practical Reason*, and (10) *Control over one's environment*. Ensuring access to the full range of central capabilities for older people could protect them against elder abuse – consider the relevance for example of (3) *Bodily integrity*, and (7) *Affiliation B* in this context.

It seems that the CA captures many of the aspects of dignity that have been highlighted in our earlier discussions. In addition, it provides a more coherent and considered philosophical background and justification. We shall now endeavour to use it as a framework to assess the likely effects that robots used in eldercare could have on the dignity of older persons

3. Dignity and the effects of robot elder care

The following consideration of the effects of robot elder care on dignity is formulated under three category headings: (i) Assistive robots and robotics (ii) Monitoring and supervising robots and (iii) Companion robots. Under each heading, a summary of representative examples, (many of which are commercially available), is provided before reflecting on their possible effects.

3.1 Assistive robotics: Assistive robots are robots designed either to help older people to overcome some of the problems of aging, or to help the carers of older people. Examples of assistive robots include the Japanese Secom "My Spoon" automatic feeding robot, and the Sanyo electric bathtub robot. The 'My Spoon' robot can enable people with limited motor control to feed themselves. The bathtub robot provides an automatic washing facility. The RIBA (Robot for Interactive Body Assistance) robot developed by Riken is a large robot with a teddy bear face that can pick up and carry humans from a bed to a wheelchair. The EI-E robot can be instructed to perform various tasks such as picking up objects, or opening drawers. Further recent examples include the Panasonic hair washing robot, which has two hands and 24 fingers to massage the scalp, and Panasonic's bed which transforms into an electric wheelchair (http://panasonic.co.jp/corp/news/official.data/data.dir/en110926-2/en110926-2.html).

Another important branch of assistive robotics is that of exoskeletons. Exoskeletons could improve the mobility of frail older people, or could help their carers to have the strength to lift and move them. A number of different companies have produced exoskeletons: the Cyberdene HAL (Hybrid Assistive Limb) suit is available for rent by medical and welfare facilities in Japan, and is probably one of the most well known. The HAL exoskeleton uses electromyography sensors to record the

electrical activity across a muscle, and then activates the exoskeleton in a scaled response to the human muscle activity. Honda has also developed a number of walking machines: the Stride Management Assist, and the 'Walking Assist' devices (New Scientist online, November 2008). Other examples include the ReWalk, the eLEGS, and the Rex exoskeletons. A recent addition to assistive robotics that is would increase mobility is Hitachi's ROPITS car (Robot for Personal Intelligent Transport System), developed for older and disabled drivers. It is designed to travel on pavements and footpaths, and to autonomously transport the user to given (nearby) locations (http://www.guardian.co.uk/artanddesign/architecture-design- blog/2013/mar/27/driverless-robot-car-elderly-disabled-mobility).

Using the CA as a framework for assessment, it is possible to identify several ways in which assistive robotics could have positive effects, and enable older people to have increased access to a number of capabilities. Exoskeletons, and driverless cars such as the ROPITS could provide fragile older people with improved 'Bodily Integrity', and increased ability 'to move freely from place to place' (*3. Bodily Integrity*). Assistive robotics that increased the mobility of older people could improve their access to other capabilities. For instance, improvements in mobility could enhance their ability to engage in various forms of social interaction (*7 Affiliation A*), and affect their social bases of self- respect and non-humiliation, (*7 Affiliation B*) and even increase their access to pleasurable experiences such as experiencing religious, literary and musical events (*4 Senses, imagination and thought*). Improved access to a wider range of capabilities can be seen as leading to a life that is more worthy of human dignity.

Assistive robots for elder care could also provide benefits to carers, and to care workers. The CA applies to all, so it incorporates concern about access to capabilities for those who look after vulnerable older people as well as the older people themselves. Assistive robots that helped with the heavy work involved in lifting older people could alleviate some of the burden of carers and care workers. Of course, it would be important to use such robot lifters in a sensitive way (see van Wynsberghe, 2012 for a detailed consideration of what this might mean).

At the same time, insensitive use of assistive robots could have a negative effect on the access of vulnerable seniors to certain capabilities. For instance, if robots were used to lift and move people in a manner that implied they were objects, this could have the effect of reducing their self-respect, and making them feel humiliated (see *7 Affiliation B*). The provision of exoskeletons to vulnerable older people who were unable to use them safely would pose risks to their own, and other people's bodily health; threatening impedance to the capabilities of *Bodily health (2) and Bodily Integrity (3).* Increased use of assistive robots in general could lead to a reduced number of interactions with humans, and so reduce older people's opportunities for social interaction and affiliation with others *(7 Affiliation A).*

3.2 Monitoring robots: There are many examples of monitoring and supervising robots that are being developed for the care of frail older people. Tele-operated robots are being used in hospitals and residential facilities: for instance, RP-7 (Intouch Health) is a tele-operated robot that has been used to facilitate doctor-patient interactions at the Silverado Senior Living Apsen Park (Winner, 2007). Companies are developing robots that could both monitor the behaviour of frail older people, and serve as mobile entertainment and communication devices. Gecko Systems are developing the CareBot™, a personal robot that can follow an older person in their own home, and that is capable of delivering medicine, remote video monitoring, and the delivery of verbal

reminders at predetermined dates and times. Care-O-bot® II, developed by Fraunhofer, was built in 2002 and equipped with a manipulator arm specifically developed for household use that is able to handle household objects such as plates, mugs and bottles. It can also act as an intelligent walking guide and has adjustable walking supporters. RoboSoft, a French robotics and automaton manufacturer introduced the Kompai robot, a mobile robot that can find its way around the home, respond to simple spoken commands, and provide access to the internet. It can allow family members to call up via Skype, whereupon the robot would detect the location of the person being called, and navigate to them so that they could communicate with the caller via its multitouch tablet PC and webcam. The EU project Companionable is developing HECTOR, a mobile companion robot that interfaces with a smart home, and offers care support facilities that include fall detection, diary management and reminders about taking medicines, as well as being able to provide remote video- conferencing with family members.

Monitoring robots can be seen in a positive light as expanding the range of capabilities for seniors, where their effect is to increase their ability to have good health (*2 Bodily Health*). They might also increase people's ability to 'move freely from place to place', or 'to be secure against violent assault' (*3 Bodily Integrity*). Monitoring robots could also offer the possibility of increased communication, since robots could be used to facilitate an older person's access to the internet, and to social networks. As such, a monitoring robot could increase their ability to 'engage in various forms of social interaction' (*7. Affiliation (B)*). Similarly monitoring, (and companion robots, see below) could be used to increase an older person's ability to be informed and cultivated by an adequate education, and to use imagination and thought to produce works and events of one's own choice, *(4. Senses, imagination and thought),* since they could provide access to educational, and creative software.

Monitoring robots could also improve the lives of carers and care-workers. Indeed, the Gecko CareBot is promoted in its advertising literature as helping the families of vulnerable older people, by giving them the opportunity to leave their charges for periods of time, since they would be alerted in the case of problems. Similarly, the relatives of an older person might feel less anxiety and stress about them if they were able to use a monitoring robot to check on their activity and health.

At the same time, the Capability Approach can be used to warn of the possible negative consequences that monitoring robots could have. Although the ability to monitor the activities of an older person might set the minds of their relatives at ease, intrusive monitoring could be an unpleasant experience for the recipient. The right to privacy is not explicitly included by Nussbaum in the list of capabilities, but the need for some privacy could be derived from (*7. Affiliation (B))*, expressed as, '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'. It is also possible that an effect of the use of monitoring and communicating robots would be to reduce the amount of social contact (*7 Affiliation A*) experienced by an older person, since as Sharkey and Sharkey (2012a) suggested, 'If a monitoring robot were used to make virtual visits to elderly parents, fewer real visits might take place.'

Furthermore, if robots were used for more than monitoring their vulnerable charges, and were able to stop them from performing certain actions, this would be seen as problematic within the CA framework because it would amount to limiting the freedom of individuals. A robot that monitored

the whereabouts of a person with dementia and, for example, stopped them from exiting the building, or from stepping into traffic, could be seen as limiting their ability 'to move freely from place to place' (*3 Bodily integrity*). However, it is also possible that the use of a monitoring robot for a person with dementia, even if it restricted their freedom in some respects, ultimately increased their well-being and self-respect, because it made it possible for them to live independently for longer. We return to the question of possible trade offs in decisions about robotic care in Section 4.

3.3 Companion robots: There are a growing number of 'companion' robots. These are usually smaller and more affordable, although some of the monitoring robots are also intended to double as companions. For instance, the Gecko CareBot is described as 'a new kind of companion that always stays close to them enabling friends and family to care from afar'. There are several examples of robot pets of which the seal-like Paro robot is probably the best known. The Paro is covered with anti-bacterial fur, and is about the weight of a human baby. Its sensors enable it to respond to being stroked, and it can express 'emotions' in response to its treatment by moving its tail, and body and blinking its eyes. It was designed as a therapeutic robot for use with older people, and its behaviours are intended to encourage nurturing behaviour. Other robot pets include the Sony AIBO dog, the Pleo dinosaur, and Omron NeCoRo, a robotic cat. Primo Puel is an interactive doll that has proved popular with older people in Japan. Babyloid is a robot baby developed in Japan. It indicates moods by means of LED lights, and has a round face with two eyes and a mouth – when crying blue LED tears it can be rocked back to sleep (New Scientist, 12 December 2011).

Despite concerns about robots in eldercare reducing the amount of social interaction experienced by older people (Sparrow and Sparrow, 2006), the Capability Approach provides a perspective from which it is possible to see how companion robots, particularly robot pets, could expand the set of capabilities available to vulnerable older persons. There is accumulating evidence that such robots can encourage social interaction (see Mordoch et al 2013), acting as social facilitators (Sharkey and Sharkey, 2012a). By doing so, they can be seen as promoting access to the capability of Affiliation (*7 Affiliation A*) by creating more opportunities to engage in social interaction. They can also be seen as increasing the opportunities for having attachments to things (*5 Emotions).* For instance, there is evidence that interacting with Paro robots can result in a reduction in stress and anxiety (*5 Emotions, not being blighted by fear and anxiety).* Robot pets could also be seen as promoting, or increasing access to the capability of Play *(9 Play),* since they might provide the opportunity to '*laugh, to play, to enjoy recreational activities'.* All of these benefits are likely to be especially important for those with dementia or other cognitive impairments that make regular social interactions with other people more difficult. There are a growing number of anecdotal examples of the Paro robot helping to calm down, and reduce the stress of people with dementia, and of encouraging social interaction in people previously very withdrawn and depressed (Shibata, 2012). For example, Shibata describes the example of a female resident in mid-stage dementia who had not communicated verbally for over a year, joining residents sitting round a table with a Paro robot on it. 'She showed no interest first, and then she reached for Paro and pulled him toward her. She began stroking him and spoke about the farm she grew up on and the animals she cared for. Since that time, she has shown minimal communication with staff and family, but more than she did before being introduced to PARO' (Shibata, 2012, pp 2533).

There is also some evidence that the introduction of robot pets can improve the lives of the *carers* of those with dementia, and that they can reduce their levels of stress (e.g. Wada et al, 2004; Shibata, 2012). Pet robots like the Paro may be able to lighten the mood of those it comes into contact with

by providing something that is fun to interact with. Carers could benefit from enhanced opportunities to (9*) Play*, and from better affiliation with those they care for (*7 Affiliation A).*

Of course*,* creating benefits for older people depends on the sensitive use of robot pets. Thrusting a robot pet into the lap of someone with dementia and leaving them alone with it would probably not work very well. Many of the benefits that can be obtained are likely to be the result of the skilled and careful deployment of the robot pet by carers and family members. There is still a risk that such robots could be deployed in ways that reduced the amount of social contact that an older person experienced; it might be assumed for instance that their need for interaction was being met by the companion robot. Sparrow and Sparrow's (2006) main concerns were that such robots would result in a reduction in the amount of social contact experienced by an older person. The evidence cited above suggests that such concerns may be unnecessary; although more detailed studies are needed.

Sparrow and Sparrow (2006) were also adamant that any attachment to robots implies deception. Questions about the extent to which the encouragement of human-robot relationships involves deception have been raised and discussed elsewhere (c.f. Sharkey and Sharkey, 2011; Sharkey and Sharkey, 2006). People can enjoy playing along with an illusion, and behaving 'as if' a robot was able to understand them. Nonetheless, robots are often designed to encourage anthropomorphism, and vulnerable humans - the very young or those with cognitive limitations -may not be clear about their abilities. In addition, it could be argued that it is important to form real as opposed to virtual, or pretend, relationships. However the real/virtual distinction does not seem to have been anticipated by Nussbaum, and is not reflected in the list of central capabilities– a point we return to below.

Could interacting with a robot pet interfere with the capability of having the social bases of self-respect and non-humiliation *(7 Affiliation B)?* It is possible: if playing with a robot pet was all that was available to do, a neglected person might engage in it, but feel humiliated as a result. It is also possible that the relatives of those with dementia might feel that their older family member was suffering a loss of dignity and some form of humiliation by being given a robot pet to interact with. Similarly, the sight of someone interacting with a robot pet as if it were real might reduce their appearance of dignity in the eyes of others: poorly trained care workers for instance. Similar concerns have been raised in the context of doll therapy (Cayton, 2006).

4. Strengths and weaknesses of the Capability Approach to dignity

In the preceding section, the CA was used to consider the possible impacts of different forms of robot care on the dignity of older people: conceptualizing that impact in terms of the extent to which robots increase or decrease their access to central capabilities. Here we reflect on the adequacy of the CA this purpose; considering both its strengths and weaknesses.

It is apparent that the CA can be used to identify both benefits, and risks of using robots in the domain of elder care. First, it is clearly possible to use the framework to distinguish areas in which robotics could be used to extend the range of capabilities that older people have access to. In particular, as discussed in Section 3.1, assistive robots that enabled increased mobility and independence could facilitate access to several central capabilities. Monitoring robots (Section 3.2) could be used to improve older people's access to different forms of communication, and to stay in touch with other human beings. And as discussed in Section 3.3, companion robots could help those with dementia and Alzheimer's to interact with other people, to have reduced levels of

stress and anxiety, and to have something to be attached to. It is also possible to see how robot care could also help the *carers* of older people to have better access to certain capabilities; assistive robots could reduce some of the burdens associated with care such as lifting; monitoring robots could help them to have some free time; and companion robots might help to reduce their stress and encourage pleasant and even playful interactions with their charges.

It is also possible to identify some of the risks of robot care within the CA framework. As discussed above, the insensitive use of assistive robots could have the effect of diminishing the social bases of self respect and non-humiliation for older people. Monitoring robots used to restrict the freedom of their charges could be seen as limiting their access to certain capabilities such as being able to move freely from place to place. The need to ensure that older people have access to the capability of Affiliation (particularly 7 *Affiliation A*), and the ability 'to live with and toward others', and 'to engage in various forms of social interaction' can be seen as capturing the concerns about loss of social contact raised by robot ethicists (e.g. Sparrow and Sparrow, 2006).

Evidently, the CA can be used as a basis for a consideration of the effects of robots in elder care. Others (Coeckelberg, 2010; Borenstein and Pearson, 2011; Vallor, 2011) have used the CA for similar purposes, although with less explicit focus on dignity than is the case here. It is interesting to consider what the CA offers over and above other accounts of dignity, and previous ethical considerations of benefits and risks of robot elder care. One of its major strengths, as identified earlier, is that it provides a view that is both wider, and more specific, about what it means to live a life of dignity. The views of dignity captured in the reports and codes reviewed in Section 1 emphasise the need for respectful treatment of older people, and of the importance of maintaining a dignified appearance. Codes such as the National Pensioners Dignity Code list many requirements for dignity; including the need to respect an individual's ability to make up their own mind, their values, cultural and linguistic background, and for formal terms of address unless invited to do otherwise. But the CA reminds us that there is a greater set of experiences and behaviours that vulnerable older people should have access to. For example, it reminds us of the need for encounters with the world of nature (*8 Other species*), and of the need to 'laugh, to play, to enjoy recreational activities' (*9 Play*). An additional strength of the CA is that as well as being concerned about frail older people, it also pays attention to the needs of those who care for them. As Nussbaum (2000) discusses in her book on Women and Human Development, it is often the case that a heavy burden of care is placed on women. There is similarly reason to be concerned for the lives of those in the care industry, where the work is often undervalued, and under paid.

Nonetheless, even though the CA has proved useful for the present assessment, it does have certain weaknesses. Having been developed as an approach to global development and justice, it does not pay detailed attention to the requirements of the particular subset of people we are concerned with here. The approach would benefit from further development and consideration of the particular issues and problems that beset people towards the end of their lives. There are aspects of dignity that seem to be especially important to older people but which are not explicitly addressed within the CA. For instance, the need for privacy always seems to be mentioned in any reports on dignity in care, but receives no explicit treatment within the CA.

Another weakness of the approach, touched on earlier, is that it pays only limited attention to some of the aspects of dignity evoked and implied by the definitions provided by Schroeder, Nordenfelt and Bostrom (see section 2, What is Dignity?). The need to maintain a dignified appearance, and the

effect that the outward appearance of dignity can have on the attitudes and behaviours of other people as outlined earlier does not seem to be covered by the CA. The CA makes only limited reference to the mental well-being of older people, and the effect that various treatments and behaviours of others towards them might have on their feelings of humiliation and self-respect. However it is clear that the experienced feeling of a loss of dignity, or humiliation, is very salient to individuals, and is something that is often emphasised in accounts of poor care or elder abuse. Coeckelberg (2010) makes a related suggestion when he says that the CA 'could be improved by putting more emphasis on the 'insider' experience of people'.

A further weakness of the approach in terms of our present purposes is that it places equal weighting on all the capabilities in Nussbaum's list, when it seems likely that some will be more crucial than others for people in the later stages of their life. For instance, although it is important that people in general should have access to an adequate education (*4 Senses, imagination and thought*), this may be less of a concern later in life. Similarly, the right to seek employment on an equal basis with others (*10 Control over one's environment A)* is likely to seem less pressing. Of course, Nussbaum is clear that her list is 'a proposal' (Nussbaum, 2011 pp36) and that it may be contested. Nonetheless, it seems likely that the increasing physical and cognitive disabilities often associated with aging are likely to give rise to the need for compromises and tradeoffs between different capabilities (Sharkey and Sharkey, 2010). For example, as touched on earlier, we can imagine a robot being used to monitor the activities of a person with mild dementia. It could, for instance, follow them when they left the house and alert carers if they left the house at night, or even prevent them from leaving. This would have the effect of limiting that person's freedom to go where they wished. But that robot might make it possible for that person to live at home with a degree of autonomy not possible in a care home. Similarly, someone with Alzheimer's interacting with a pet robot seal might suffer a reduction in their apparent dignity in the eyes of others, but the health and social benefits that they gained as a result might justify that reduction.

Nussbaum insists that the set of capabilities is not fungible, and that capabilities cannot be traded off against each other since, in her words, 'respect for human dignity requires that citizens be placed above an ample (specified) threshold of capability in all ten of those areas' (2010, p36). However, in her recent discussion of Wolff and De-Shalitt's work on disadvantage (Nussbaum, 2011), she seems to have moved towards a recognition that some capabilities are more important than others. Wolff and De-Shalitt (2007) introduce the twin concepts of 'fertile functioning' and 'corrosive disadvantage'. Fertile functionings refer to certain capabilities, such as affiliation, that when enabled, tend to promote other related capabilities. For instance, increasing the mobility of older people can open up many other options. Corrosive disadvantage is the flip side; a deprivation that has large effects in other areas of life. For example, subjection to domestic violence, or feelings of humiliation, could affect other capabilities related to health, well being, affiliations, and practical reasoning. Nussbaum acknowledges that in situations of 'tragic choice' (Nussbaum, 2011, p37) where the achievement of one or more capabilities is at the cost of others, some capabilities may take priority over others if they could be considered either to represent a fertile functioning, or to remove a corrosive disadvantage.

Wolff and De-Shalit's work on disadvantage is based both on abstract philosophical theory, and on empirical research. They interviewed disadvantaged people in Israel and Britain, questioning them about their views on failing to achieve Nussbaum's 10 capabilities. The interviews led them to conclusions about what it means to be disadvantaged, and how disadvantage can be best addressed.

As Wolff and De-Shalitt point out, there are some advantages to augmenting an approach such as the CA by means of more empirical forms of enquiry, or 'dynamic public reflective equilibrium', by which they mean ' consultation with people from a wide variety of walks of life; analysis of surveys, and the like' (Wolff and De-Shalit, pp 40). It would be very interesting in future work to take a similar approach to an investigation of the meaning of dignity in the context of elder care: to find out more about the relative importance of different capabilities for older people and to explore the contexts in which tradeoffs between them might be acceptable or even welcomed.

There is another aspect to the consideration of robot care for older people to which little attention is paid in the CA. As touched on earlier, this is the need for real, as opposed to virtual care, and for real as opposed to virtual social interaction. The development of robots for the care and companionship of older people increasingly opens up the possibility of meeting some of their needs by means of technology. In the vignette provided at the beginning of this paper, a frail old lady's needs for food, conversation and companionship are being (partially) met by means of robots, but as suggested at the outset, many people might consider such a life to be lacking in meaning. Coeckelberg (2012) considers a similar fictional scenario, in which the social needs of 'Grandpa' are met by means of interacting with other people on social networks whilst he remains isolated in a sealed pod, away from physical human beings. Many writers have expressed concern about the substitution of virtual care for real care (Coeckelberg, 2010), or fake attachment to objects for real attachment to living things (Turkle et al 2006). Perhaps the list of capabilities should be modified to reflect such concerns. These issues are likely to become increasingly important in the light of our ever expanding engagement with technology. Both the CA, and human rights approaches in general, have largely been formulated without consideration of the possibility that the humans that affect our lives could be replaced by automated procedures and algorithms, and by their physical embodiment in the form of robots. It might be, as Coeckelberg (2012) suggests, that our expectations and beliefs will change with advancing technology until we see such things as ethically equivalent to living creatures. Or we may come to realise the need to insist on our rights to be cared for and looked after by real human beings – at least some of the time.

5. Conclusions

We have considered here the ways in which being looked after by robots could affect the dignity of older people. After highlighting concerns about dignity and elder abuse, and examining some of the complexities of the concept of dignity, the Capability Approach was adopted as a framework to guide a more detailed consideration of the effects of three categories of elder care robots. Since the CA offers an account of what is required for a life worthy of human dignity, its use as a framework for evaluating the effects of robots on the dignity of older people equates to assessing the ways in which robots can increase, or impede their access to the central capabilities. Our evaluation found examples of both: some forms of robot intervention that could increase frail older people's access to central capabilities, and some uses that could reduce their access. In this sense, the CA permits a valuable and balanced perspective on the relationship between robots and the dignity of older people, highlighting some positive consequences that could result from the careful deployment of certain forms of robotics and warning of potentially negative ones.

In the last section of the paper, the CA was reflected upon as a framework for this assessment. It was found to have both strengths, and some weaknesses. The wider and well developed perspective on the meaning of dignity that it provides is an important strength. So too is its ability to incorporate many different aspects of dignity, as is its ability to simultaneously reflect the needs of both vulnerable older people, and those who have the job, or the obligation, to care for them. The approach however places less emphasis on the internal experience of individuals and their feelings of self-respect than is apparent in some discussions of dignity. This could be seen as a limitation. Another limitation is that Nussbaum does not yet seem to have considered the increasing likelihood that technology could be used to replace humans in

important roles. There is also little recognition within the CA of the compromises and tradeoffs between capabilities that may have to be made when reduced physical and cognitive abilities make it difficult to achieve the full set of central capabilities. These weaknesses could be overcome in future developments. It is suggested that further empirical study, using the CA as a starting point, could improve our understanding of the best ways to use robotic technology to help maintain our dignity as we age.

Nussbaum (2011) describes the Capability Approach as being offered as 'a contribution to national and international debate, not as a dogma that must be swallowed whole'. Its adoption here enables us to take a step towards an increased understanding of the relationship between human dignity and robot care. Admittedly there are aspects of dignity that are relevant to the experience of older people that it fails to capture. Nonetheless the approach provides a unifying basis for identifying the potential effects of robots. It leads to the conclusion that certain forms of robotics, sensitively used, can increase the access of vulnerable and frail older people to a wider set of "substantial freedoms" (Sen, 1999).

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