

Robots, Eldercare and Meaningful Lives

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ABSTRACT

In this paper we examine how the use of robots in caring for elders can impact the meaningfulness of elders' lives. We present a framework for understanding 'meaningfulness in life', and then apply that framework in discussing ways in which the use of robots to assist in activities of daily living can preserve, enhance or undermine the meaningfulness of elders' lives. We conclude with a discussion of if and how having false beliefs about companion robots can affect meaningfulness in the life of the person having those false beliefs.

In discussions of how the use of robots to care for elders can affect the well-being of those elders, one phenomenon that has been neglected is the impact that the use of eldercare robots can have upon the meaningfulness of elders' lives. In this paper we examine how the deployment of assistive robots and companion robots can affect both objective meaningfulness, understood as the causal impact that elders have upon others, and subjective meaningfulness, understood as the experience of activities that are regarded as worthwhile or important. We find that some deployments of robots can preserve or enhance elders' opportunities to create meaningfulness, while other deployments can undermine elders' opportunities for creating meaningfulness in their lives. Insofar as meaningfulness is an important feature of living a good life, those who decide the ways in which robots will be deployed in eldercare have a moral obligation to attend to the ways those deployments impact the opportunities for meaningfulness in elders' lives.

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1. Meaningful Lives

When talking about meaningful lives, a first distinction must be made between meaning *of* life and meaning *in* life. The former term designates a cosmic, external sense of meaning, a purpose conferred on our lives by some source outside our lives. That kind of meaning would answer ‘why’ questions: why are we here? Why am I here? On the other hand, meaning *in* life is an internal meaning that is not discovered but rather created (or not) by our actions. Here questions of meaning are not ‘why’ questions, but practical questions of how we should live, what kinds of lives are worth living. Our concern in this paper is with meaning in life in the internal, this-worldly sense.

There is no consensus in contemporary philosophy on what specific properties or activities make life meaningful in this internal sense. A principal dispute concerns whether meaning in life is an objective feature of lives, or a subjective state, or a combination of the two. Objectivists maintain that the meaningfulness of a life is solely an objective property of that life, for example, the extent to which a person produces good effects in the world (Smuts, 2013). Subjectivists hold that meaningfulness is a matter of a person’s subjective sense of or attitude towards their life. Paul Edwards writes: ‘We are inclined to say: “If his life had meaning to him, then it had meaning – that’s all there is to it”’ (2008, 127). Hybridists claim that meaningfulness requires both a sense of subjective fulfillment and some features (activities, effects) that are “objectively attractive” (Wolf, 2010). For the objectivist, a person’s producing good effects in the world is necessary and sufficient for meaning in life, regardless of one’s attitude toward her own life. For the subjectivist, one’s attitude is necessary and sufficient for meaning, regardless of the effects of that person’s life. For the hybridist, the effects and attitudes they produce are jointly necessary and sufficient for a life having meaning.

Aaron Smuts (2013) defends an objectivist view by presenting the case of the character George Bailey in the film *It’s a Wonderful Life*. Bailey, despondent over the course of events, is contemplating suicide. Clarence, his guardian angel, changes Bailey’s mind by showing him how his life has had a positive impact on many others. Smuts’ intuition about this case is that it is not that Bailey’s life became meaningful only after Clarence’s intervention, but rather that Bailey came to realize that his life was meaningful *before*, even at the time that he lacked a subjective belief in its meaningfulness. On this view, a subject-

tive understanding of the meaningfulness of our lives is not a necessary condition for a life to be meaningful. This seems intuitively correct: individuals can be unaware of profound impacts they have on others, and it makes sense to say that this impact contributes to the meaningfulness of their lives regardless of their awareness of their impact.

If one's intuitions about this example are similar to Smuts, one will think that meaningfulness has to do at least in part with the ways in which a person's life impacts or influences others' lives. Thaddeus Metz (2015) identifies the lives of Nelson Mandela, Mother Theresa, Einstein and Picasso as lives that were "obviously" meaningful in this sense. Christopher Hamilton (2018) asserts that the lives of Kafka, van Gogh, and Dostoevsky were meaningful in this same sense. Framing meaningfulness in terms of a person's effects upon the world implies that meaningfulness has an objective component—that is, that meaningfulness is not, or is not solely, a matter of one's beliefs or attitudes or values regarding one's life. As Mark Bernstein (1998) puts it, meaningfulness is a matter of the extent to which our lives are "robustly integrated into the causal fabric of the world".

On the other hand, on the subjectivist position meaning is a matter of what we value or what we find important or worthwhile. It is expressed in our plans, projects and commitments. A meaningful life is one in which a person is able to do what matters to them, whether that be collecting baseball caps or working with Habitat for Humanity. What makes it meaningful is the subjective attitude or experiential state one has regarding the activity.

When psychologists talk about meaning in life, they are talking about meaning in the subjective sense. The psychological literature on meaningfulness differs from the philosophical literature in its focus, which naturally enough is on people's psychological states as they relate to meaningfulness. Broadly put, the focus is on *personal meaning*, which can be roughly understood as a construction arising from ways that people organize, interpret and evaluate their experiences and actions in order to create a sense that those experiences and actions are worthy of investment and commitment—i.e., that they are meaningful (Wong and Fry, 1998).

Psychological approaches seem naturally aligned with the subjectivist philosophical perspective on meaning, insofar as a subjective sense of meaningfulness is central to both. A significant part of the psychological literature on meaning is empirical research on what people say adds meaning to their lives—

in other words, people's beliefs and attitudes about what matters to them. Melissa Grouden and Paul Jose (2014) summarize findings from ten studies:

It is evident that there is quite some variation between studies as to how sources of meaning are categorized. However, one consistent finding is that interpersonal relationships have been found to be the most frequently reported source of meaning across numerous studies (e.g., Baum & Stewart, 1990; Debats, 1999; O'Connor & Chamberlain, 1996; De Vogler & Ebersole, 1981; Yalom, 1980). Social connection appears to be essential to evaluating one's life as meaningful (Lambert et al., 2010). However, when the next most important sources are probed, a varied picture emerges with no consistent pattern. Examples of the second most important sources of meaning include preservation of values (Bar-Tur & Prager, 1996; Prager, 1998), personal growth (Prager, 1996), creativity (O'Connor & Chamberlain, 1996), and work (Debats, 1999; Delle Fave et al., 2010). (30)

Most people consider their relationships to be the principal source of personal meaning in their lives. One central feature of relationships is that they present us with opportunities to transcend our own personal concerns and make differences in the lives of others: we can learn from and support one another. Recall the people that objectivists asserted to be intuitively obvious examples of individuals whose lives were meaningful: Nelson Mandela, Mother Theresa, Einstein, Picasso, Kafka, van Gogh and Dostoevsky. The feature their lives share is their impact on others. They "made a difference". Most of us will not become the next Mandela, Einstein or van Gogh. But we can and will have an impact on others, in particular our family and friends. Relationships can be both objectively and subjectively meaningful.

As for the other leading sources of personal meaning identified by Grouden and Jose, preservation of values fits under the heading of making a difference in the lives of others. While personal growth, creativity and work could be completely self-focused, they could equally result in making a difference in the lives of others.

This indicates that we often find personal meaning by means of activities through which we make a difference in the world. While subjective (personal) meaning and objective meaning do not necessarily coincide, neither are they completely separate. What people say matters to them aligns to a significant extent with what "should" matter to them on objectivist views. The psycho-

logical research indicates that much of what is found to be subjectively meaningful is activities that have meaning in the objectivist sense. Thus the two conceptions often point to the same things.

While the features in life that are subjectively meaningful are often the same as what is objectively meaningful, the concepts are not coextensive. People can find activities to be subjectively meaningful, such as running marathons or baseball cap collecting, that have little or no causal impact on the world. And people can have a causal impact by means of their activities without a subjective sense of meaningfulness arising. For example, a grandparent could profoundly influence a grandchild's life, without either of them coming to have a subjective awareness of that influence. So neither form of meaning is a necessary or sufficient condition for the other. Thus the concepts should be kept separate, and we will do so going forward in this paper.

2. Assistive Robots and Elders' Meaning Making

In this section we address the issue of how robotic assistance in activities such as eating, walking, driving, and getting out of bed can affect the objective meaningfulness and subjective meaningfulness of elders' lives.

Objective meaningfulness is a matter of having a causal impact. People have causal impacts through their words and actions—sharing ideas, advising, solving problems, and creating objects, policies and institutions. There are many ways that robots can assist people to communicate and act, thus aiding them to have a causal impact. For example, the Vasteras Giraff is a mobile telepresence robot that can be directed to locate an elder in their home and to initiate communication with family, friends, health care professionals, and others. Robotic exoskeletons and cars can enhance mobility, for example, transporting an elder to the local yarn shop so that she may continue to knit and donate sweaters for infants and toddlers. By assisting with activities of daily life such as eating, bathing, and getting out of bed, and by guiding elders through physical rehabilitation activities after injury, robots help maintain conditions under which elders can impact the lives of others.

There do not seem to be ways that the introduction of robots *per se* into eldercare precludes elders from having a causal impact: robots do not necessarily impose barriers to elders' communication and action. However, there is one frequently raised concern: that the introduction of robots in elder care will lead humans who are normally responsible for performing care activities to 'let

the robot do it'. If robots can feed, bathe, and lift elders, monitor for falls, remind elders to take medicines, and so on, then interactions with humans might decrease, which could in turn limit the opportunities for elders to make a difference in the lives of others (Sparrow and Sparrow, 2006; Sharkey and Sharkey, 2012). Each human-robot interaction is one less human-human interaction, and thus one less opportunity for objectively meaningful activity.

We believe that this is a legitimate concern, but that there are mitigating factors. For one thing, interaction with others is not always necessary for having an impact on others' lives: the woman who knits and donates sweaters for children may do so in relative isolation, never meeting any of the children who receive her sweaters. Secondly, in cases where interaction with others *is* a condition for making a difference in their lives, we note that the use of robots such as the Giraff and self-driving cars can be a means to increased interactions between elders and others.

The risk that critics point to seems to center on the use of robots in assisting people in activities of daily living (ADLs) such as bathing, eating, getting out of bed. If humans allow robots to replace them in assisting elders in ADLs, then the number of opportunities for elders to interact with other people will be reduced. In response, we point out that fewer opportunities for interactions with others does not imply less causal impact in the lives of others, i.e., less objective meaningfulness. None of us has unlimited opportunities to make a difference in the lives of others. We are limited by external circumstances and our individual abilities, as well as our need for "me time" to relax and recharge. To the extent that a robot can assist an elder to relax and recharge by means of a hot bath or a walk in the park, the robot can be helping that elder to prepare themselves to engage with others in meaningful ways.

This is not to deny that replacing humans with robots in caring for elders *can* lead to loss of opportunities for objective meaningfulness in those elders' lives. Rather, we are arguing that if our choices of when and how to use robots are mindful of what makes life objectively meaningful, the use of those robots need not undermine, but can preserve and enhance, opportunities for elders to make differences in others' lives.

With regard to subjectively meaningful lives, we first note that, while the categories of features that people identify as creating personal meaning in their lives are largely consistent across individuals and cultures, the specific vary greatly. Some things that are subjectively meaningful to an unmarried Japanese philosopher may not be at all meaningful to a Danish carpenter and father of two

young children. And things that are meaningful to a Brazilian accountant early in her career may fade in significance later in her life. It is a matter of which specific goals and activities are part of an individual's conception of (or plan for) their life.

Consider robotic assistance in ADLs such as eating and bathing. While it is surely the case that most people wish to be able to perform ADLs independently, such activities are not typically ones that people regard as carrying significant meaning. It would be an odd person who wished their epitaph to be "She fed and bathed herself to the end." Rather than independence in ADLs, the psychological research cited above indicates that the quality of relationships is the most important meaning-conferring feature of life. Wendy Lustbader (1999) discusses the importance of relationships in an assistive context:

If I do reach the point where I can no longer feed myself, I hope that the hands holding the fork belong to someone who has a feeling for who I am. I hope my helper will remember what she learns about me and that her awareness of me will grow from one encounter to another. Why should this make any difference? Yet I am certain that my experience of needing to be fed will be altered if it occurs in the context of my being known....If she would talk to me, if we could laugh together, I might even forget the chagrin of my useless hands. We would have a conversation, rather than a feeding. (22)

Can one have a conversation, rather than a feeding, with a robot? Perhaps. But can a robot and person genuinely "laugh together"? If robots lack an emotional life, the answer would seem to be no, which in turn suggests that the use of robots to help people eat deprives elders of an opportunity for a subjectively meaningful relationship.

But if, as we assert above, the subjective meaningfulness of activities is relative to individuals and context, the matter is more complex. While there are likely many cases in which the person needing assistance to eat desires "a conversation rather than a feeding", there can be other cases in which this is not so. Like the young boy who wolfs down his dinner so that he can get back outside and play with his friends, some elders might prefer to eat quickly in order to resume some other activity that they find meaningful. In such cases the assistance of a robot would be no hindrance to meaningfulness.

Filippo Santoni de Sio and Aimee van Wynsberghe (2016) make a similar point in discussing the use of robots to lift people:

For some people in some circumstances lifting is just about moving from one place to another; for those people human company or even the presence of other people is not a part of the activity of lifting....In other words, an elderly person who endorses this view of the nature of lifting may reasonably prefer to be enabled by a machine to safely, efficiently, autonomously lift as opposed to be caringly, compassionately, empathetically assisted by a human carer in lifting. (1753)

For some people, lifting is simply be a task to be performed so that they can move on to the activities they value. For others, the act of being lifted is more than a task: insofar as the person being lifted is vulnerable, and must trust the one doing the lifting, the act is as an expression of the bond between the two. Since being lifted can carry different significance for different people, the use of a lifting robot may be a hindrance to meaning making for some but not others.

So too, whether the use of a hair washing robot or a robot monitoring for falls affects meaningfulness in life can only be assessed case by case, by determining how that use of that robot fits into the life of the person being assisted. If there are opportunities for subjectively meaningful activities readily available, having one's scalp massaged by a robot may not diminish the meaningfulness of a life in the least. For a person who is able to converse with friends and family, play games, and volunteer for the Red Cross, robotic assistance with eating or bathing, while not necessarily desired, might be nothing more than a minor nuisance. Conversely, for a man who is socially isolated and disengaged, dependencies on others, whether robots or not, for basic bodily functions could take on much greater significance: the loss of the ability to independently do what 'even animals' can do will matter more in the absence of the ability to perform more personally meaningful activities.

In sum, assistive robots can allow elders opportunities to engage in both objectively and subjectively meaningful activities. Thus there is nothing inherent in the use of assistive robots that necessarily undermines opportunities for meaningfulness in the lives of those being assisted; if meaningfulness is negatively impacted, it will be due to features of the lives and situations in which robots are deployed, not the properties of the robots or their interactions with humans per se.

In addition to attending to the implementation of robots in elders' lives, it is important to recognize another avenue for creating and enhancing meaningfulness in elders' lives, namely, if elders are provided with opportunities to influence the design of assistive robots. Rogers *et al.* (2022) note how inviting

elders to engage in “participatory design” (PD) of robots to meet their needs and preferences makes it more likely that elders will accept those robots in their lives. An elder who contributes to the design of the robots that they or others will interact with is obviously enhancing the objective meaningfulness of their life. In addition, we believe it is highly likely that at least some elders involved in PD would find those experiences subjectively meaningful as well.

3. Companion Robots, False Beliefs and Meaningfulness in Life

Companion robots are designed to be engaged with by humans in a ‘social’ way. For example, the Paro robot is a fur-covered, seal-like robot that responds to being stroked by moving its tail and body and blinking its eyes. It was designed to be used therapeutically with older people, to encourage nurturing behavior. There are also robotic dogs, cats, dinosaurs and dolls that people can interact with. Sharkey (2014) reports on studies and anecdotal accounts claiming that the use of companion robots can reduce fear and anxiety, promote playfulness, and encourage social interaction with other people by acting as social facilitators.

With regard to meaningfulness, a number of authors raise the concern that, for robots to effectively serve as companions, people must believe that the robots are something that they are not, namely entities that both have a well-being of their own and care about the well-being of others. Many of these authors frame the issue in terms of deception on the part of those who design companion robots (Sparrow and Sparrow, 2006; Wallach and Allen, 2009; Sharkey and Sharkey, 2011; Mathias, 2015). But deception would seem to require intention, and it is not clear to us that the designers of robots intend that robot users acquire false beliefs; it may suffice for the designers’ purposes for robot users to *pretend* that robots have certain properties, rather than that they acquire false beliefs about the robots.

For our purposes the cases of interest involve people, such as elders with cognitive impairment, who go beyond pretending, to actually believing that robot companions need their attention or have become their friends. In such cases, elders come to have false beliefs, whether those false beliefs are the product of deception or not. We will examine the impact that such false beliefs can have on the objective and subjective meaningfulness of elders’ lives.

But first we must address John Danaher’s position that if people come to have beliefs that robots have capacities such as the capacity to care for people,

such beliefs may not necessarily be false. Danaher (2020) addresses cases of what he calls “superficial state deception”, defined as when “the robot uses a deceptive signal to suggest that it has some capacity or internal state that it actually lacks”. People coming to think that a robot needs their attention or that a robot has empathy for them would seem to be good examples of this kind of deception. But according to Danaher, coming to have such beliefs about robots may not be a case of deception at all, but in fact those beliefs may be warranted. Danaher adopts an epistemological “ethical behaviorism” to determine what we are warranted in believing about robots (and others for that matter): the strongest evidence we have that an entity has certain capacities/mental states is its behavior. His position is that

According to ethical behaviourism, if a robot appears to have certain capacity (or intention or emotion) as a result of its superficial behaviour and appearances, then you are warranted (possibly mandated) in believing that this capacity is genuine. In other words, if a robot appears to love you, or care for you, or have certain intentions towards you, you ought, *ceteris paribus*, to respond as if this is genuinely the case. There is no inner state that you need to seek to confirm this. This means that, contrary to what Sherry Turkle and like-minded critics might suppose, simulated feeling can be genuine feeling, not fake or dishonest feeling. Consequently, if ethical behaviourism is true, then superficial state deception is not, properly speaking, a form of deception at all. This is because superficial states provide the best epistemic warrant for believing in the presence of the relevant mental states or capacities, at least for ethical purposes. (17)

Danaher rejects the idea that we should discount the behavioral evidence in the face of claims we might make about some internal properties of organisms versus robots, such as the claim that organisms but not robots have sentience, and thus the whimpering of a dog has different ethical significance than the whimpering of a robot. In response he writes:

But really there is no reason to think that evidence concerning biological constitution should trump or undermine behavioural evidence, at least if that behavioural evidence is consistent and complete. In other words, if a robot consistently acts in a way that suggests its whimpering is genuine, then there is no reason to deny it an ethical significance that is granted to the dog, apart from an unjustifiable fealty to biology. (18)

In response, we call attention to moral intuitions about our behavior towards robots and organisms. If we tire of or get annoyed with a robot, we might simply

turn it off. In turning off a robot, our intuition is that no morally salient issues arise (assuming that turning it off did not inconvenience or harm another person). Conversely, if a person tires of or gets annoyed by a dog and as a result has the dog put into a coma, our intuition is that something morally salient arises regarding this action. Why do our intuitions diverge in these cases? We suggest that it is because the dog has a life of its own—it is an independent locus of experience—and that is why suspending the dog's life to serve the purposes of another raises moral questions. Since a robot does not have a life of its own, shutting it off has no moral quality. So too, our intuition that causing a dog to whimper is morally significant in a way that causing a robot to whimper is not reveals how our understanding of the nature of these entities is a morally relevant consideration rather than an “unjustifiable fealty to biology”. If a robot whimpers, we know that it is because its designers have given it that property, and we also know that the designers have done so in order that the robot might *appear* to be a kind of being that can suffer. Our understanding of what is “behind” a robot's behavior—the motives of robot designers—allows us to deny that the evidence provided by robot behavior is a sufficient warrant for believing that robots can suffer.

Thus we maintain that coming to believe that companion robots have properties such as sentience, empathy and loyalty is indeed a case of coming to have false beliefs. We next turn to how having such false beliefs can affect the meaningfulness of our lives.

Imagine a situation in which you falsely believe that your colleagues admire your work. Presumably you would find it satisfying to believe that you are appreciated. But for most people this situation lacks the subjective meaningfulness possessed by a situation in which one's work was truly appreciated: if asked which scenario they would prefer, we are confident that most people would strongly prefer the second scenario (where one's work is truly appreciated) to the first (where one falsely believes that one's work is appreciated). For most of us, having our beliefs match how the world is has value to us, independent of the felt quality of our experiences, which would be identical in the two scenarios above. We prefer that our partners truly be faithful and that our colleagues truly think we are assets to our organizations, rather than that our partners deceive us about their fidelity and our colleagues deceive us about our value. In general, having true beliefs is more valuable—has more subjective meaningfulness—than having false beliefs. (We will examine some counterexamples to this generalization below.)

As for objective meaningfulness—one's causal impact on the world—if one has the false belief that one's colleagues admire one's work, this suggests that one's work does not have the impact one thinks it does. While having the false belief does not cause this lack of impact—it is not the cause of one's work not being appreciated—possessing the false belief does hinder one from acting in ways that could address the situation, insofar as it prevents one from recognizing that there is a problem. If you did not know that your colleagues do not find you to be helpful, or that your partner is not faithful, you would not see that there is a problem to be addressed, and thus you would be denied an opportunity to alter the causal impact you have in your organization or relationship.

The use of companion robots could hinder objective meaningfulness if elders come to falsely believe that their companion robots truly need their attention. Attending to what they perceive as the robot's needs, they would mistakenly believe they were having a meaningful causal impact in the world. In focusing on the robot, the elder might thus be precluded from engaging with real organisms in objectively meaningful ways.

With regard to subjective meaningfulness, the issue at hand can be framed in terms of the genuineness of relationships, by which we mean the extent to which a person's beliefs about the beliefs, desires, and attitudes of the other(s) in the relationship accurately reflect the actual beliefs, desires and attitudes of the other(s). If an elder values genuineness in their relationships, then falsely believing that their companion robot liked them, respected them, and cared about them would undermine the subjective meaningfulness of their life. Like the person who falsely believes that their colleagues admire and respect them, the relationship is not what they think it is. If one of the things that the person finds subjectively meaningful is the accuracy of their beliefs about their relationships, an ingenuine relationship will not have the subjective meaningfulness that they want and believe it to have.

Sparrow and Sparrow (2006) argue that nearly all cases of coming to have false beliefs harm believers for two reasons:

First failure to apprehend the world accurately is itself a (minor) moral failure. We have a duty to see the world as it is. It is a sad thing to be deceived about the world; it is a bad thing to perpetuate and prolong such deception ourselves. Thinking that an expensive and sophisticated toy is really our friend is sentimentality of a sort we should avoid.... Second, and more importantly, such deception is a bad thing because our preferences are unlikely to be met, our interests advanced, or our well-being served, by illusions.... Indeed, we are likely

to be substantially worse off because without knowledge of the way the world really is we are unable to realize our desires—which refer to states of the world. (155)

We agree in general with the claim that having false beliefs is a bad thing. We have argued above that having false beliefs about the nature of robots or of our relationships with them can hinder our striving for objective and subjective meaningfulness in our lives.

However, we believe the matter is more complicated. Having false beliefs about the nature of companion robots need not preclude opportunities for objectively and subjectively meaningful activities. Consider this analogy: suppose someone has an extensive set of false beliefs about the composition, structure, and functioning of their car. This person uses their car to deliver medicine and food to people living on the street, and finds great satisfaction in doing so. We submit that the objective and subjective meaningfulness of this person's life is unaffected by the false beliefs they have about their car, and that if they gained true beliefs about their car, the meaningfulness of their activity would not be enhanced.

Focusing again on relationships as a source of both objective and subjective meaningfulness, we note how companion robots can serve as social facilitators, giving the elders using such robots something to talk about with other people. By fostering interactions between people, the deployment of companion robots can create opportunities for objective and subjective meaningfulness. Sharkey and Sharkey (2011) report:

For instance, when Wada and Shibata...videoed interactions between a Paro robot seal and a group of elderly care home residents, they found that the social interactions between the residents themselves increased at the same time that physiological indicators showed reduced stress levels. It seems that Paro even encouraged positive communication and resulted in a reduction of backbiting that had previously characterized their interactions. (36)

We can readily imagine one elder having false beliefs about a companion robot under these circumstances and another elder not having false beliefs about that robot, yet both elders having a similar causal impact in the relationships they foster, and both finding subjective meaningfulness in those relationships. If so, elders having false beliefs about the nature of their relationships with companion robots is consistent with the creation of opportunities for subjectively and objectively meaningful activities.

4. Conclusion

We have examined how the use of robots in caring for elders can affect both the causal impact that elders can make in the lives of others (objective meaningfulness) and elders' ability to engage in activities they find worthwhile (subjective meaningfulness). With regard to assistive robots we find that, on the one hand, their deployment can undermine objective meaningfulness if it deprives elders of opportunities to interact with other people. If, as is typical, elders value relationships as a source of meaning in their lives, then if assistive robots replace humans in elders' lives, elders can experience a loss of subjective meaningfulness as well. On the other hand, the use of assistive robots does not necessitate a reduction in interactions between elders and others, and in fact there are ways that the use of robots can preserve or enhance such interactions. In addition, inviting elders to contribute to the design of robots can enhance both objective and subjective meaningfulness in their lives.

We have also explored the possibility that deployment of companion robots can lead to elders coming to have false beliefs. We recognize that this is possible, and that it is generally undesirable to have false beliefs. But, contrary to what others have asserted, we have argued that elders having false beliefs about robots does not necessarily undermine either the causal impact or the subjective fulfillment elders have when using companion robots.

Our assessment suggests that those who implement the use of robots in eldercare need to attend specifically to the ways in which the deployment of robots can affect opportunities for elders to make differences in others' lives and to pursue those activities that they find worthwhile.

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