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Can robots lie? A posthumanist approach to robotic animals and deceptive practices in dementia care

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A R T I C L E I N F O

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A B S T R A C T

Robotic animals are designed to resemble real, living animals, but at the same time, dementia care guidelines and policies often emphasize the value of transparency in relation to robots—people should not be led to believe that robots have capacities that they in fact lack. However, it is not obvious how to separate truth from lies in everyday care practice. Based on participant observations and interviews with certified assistant nurses and nursing assistants in Swedish nursing homes for people with dementia, this article studies how robotic animals become "real" in care practice. The article takes a posthumanist approach to the co-constitution of aging, care, and technology—a perspective that recognizes that not only care staff and nursing home residents, but also robots and other material things, can take an active part in shaping care practice. The analysis results in four typical situations out of which robotic animals emerge as real, living animals: *the cuddle*, with its simple but dynamic embodied actions; *the comfort*, where the robot is used as a resource for distraction and emotional support; *the conversation*, by which robotic animals' agency is both established and challenged; and *the adoption*, through which narratives and props are used to establish the robot as a pet. Robots cannot lie, at least not by themselves; instead, robots' deceptive potential is enabled by a network of actors, which is why it is often difficult to draw a clear line between lying and care workers' empathic following.

The first robotic animal created for use in dementia care was designed to deceive. In 1993, at Japan's National Institute of Advanced Industrial Science and Technology, a team of engineers led by Takanori Shibata designed the robotic seal Paro for use with older adults in need of care (Shibata & Tanie, 2000). The reason Shibata chose a seal as a model animal was that few users would have met a baby seal in real life. The users would have no point of comparison when encountering Paro for the first time which would therefore make it more likely that they would think that they were interacting with a living animal (Shibata, Inoue, & Irie, 1996). But who, or what, is responsible for the deception? Is it Shibata who designed the robot, the robot itself with its tender movements and squeaking sounds, or the assistant nurse who puts the robot in the lap of a nursing home resident? Based on participant observations and interviews with certified assistant nurses and nursing assistants in Swedish nursing homes for people with dementia and additional interviews with managers and health technology experts, this article aims to identify how robotic animals become "real" in care practice. To do so, it takes a relational stance to deception, recognizing that care workers, nursing home residents, and robotic animals, as well as abstract concepts, are all part of conjuring the illusion of a real, living animal "in a web of interrelated effects" (Höppner, 2023, p. 3).

Although robotic animals were originally designed to make users feel that they are interacting with a living animal, deception involving robots in dementia care is not without controversy: their deceptive potential challenges the integrity of people living with dementia and their chances of making informed consent (Blackman, 2013). The Swedish National Council on Medical Ethics (SMER) underlines that it is crucial not to ascribe characteristics to robots that they do not in fact have, as it impedes users' ability to make an educated decision whether and how to use the robot (Statens Medicin-Etiska Råd (SMER), 2014, p. 60). This

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problem of "deceptive" robots also relates to the wider issue of lies and deception in dementia care (Culley, Barber, Hope, & James, 2013; James, Wood-Mitchell, Waterworth, Mackenzie, & Cunningham, 2006). In Sweden, where the present study is conducted, national guidelines for dementia care (Socialstyrelsen, 2017) advise against deceptive practices. In contrast, United Kingdom guidelines state that lying can be justified in person-centered care (see, e.g., The Mental Health Foundation, 2016) and in other countries (e.g., Italy), there are no official guidelines concerning lying at all (Cantone et al., 2019). The varying status of lying in care settings for people living with dementia highlights the potential dilemma of truth and lies in this context: If they lie, care workers risk contributing to difficulties navigating reality for people living with dementia, but by constantly pursuing the truth, they may counteract the beneficial effects of robotic animals. In this article, we examine the informal frameworks for handling deception and lies in interactions between nursing home residents, care staff members, and robotic animals to provide a much-needed empirical contribution for understanding this dilemma.

The study of robots in dementia care exposes the limitations of traditional, humanist ideals. First, the critique against deception in dementia care presupposes the humanist notion of the rational and autonomous subject—a fully able-minded person who at any point can tell truth from lie and remember it over time. Yet, for someone with impeded cognitive abilities and an impaired short-term memory, emotional relationships and embodied habits may be more central to their self-image than propositional knowledge (Matthews, 2020). What is more, a traditional, humanist notion of care presupposes that the carer is human, although machines and animals are widely used in care practices today (Persson, Redmalm, & Iversen, 2022). Therefore, this study draws on a posthumanist approach—an approach that engages in a "critical exploration of Man as a socially constructed entity" (Jenkins, 2017, p. 1491), and regards agency as something that is not exclusively human, but emerges from relations between humans, and between humans and things (Barad, 2007; Cozza, 2021; Quinn & Blandon, 2020). Thus, the present study does not assume a fixed identity for the robots (Peine & Neven, 2021)—robots cannot lie, at least not by themselves. But neither is deception exclusively the result of an active carer manipulating a passive recipient of care. Instead, robots' deceptive potential is enabled by a network of actors that shift depending on the context. This also means that the posthumanist approach does not consider truth, reality, lies, and deception to be static, universal concepts. To deceive is therefore best understood as a wide spectrum of actions that carry family resemblances but which lack one single, uniting characteristic (see Wittgenstein, 1958, p. 32). The present study therefore explores different practices in which robots become "real" animals in care practice and situations where robots are dismissed as "fake," without presupposing that a strict and objective distinction is possible between the two.

The next section gives an insight into how lying and deception in dementia care have been studied and is followed by a presentation of a posthumanist approach to the co-constitution of aging, care, and technology. After an account of the methods used, an analytical section presents four situations in which robotic animals are typically deployed, with different potentially deceptive outcomes: the cuddle, the comfort, the conversation, and the adoption. The article concludes that a posthumanist approach can be used to identify the gray zone practices emerging when it is difficult to draw a clear line between lying and care workers' empathic following. The approach also allows for an understanding of deceptive practices, in which illusions are viewed as joint accomplishments between human and non-human actors.

Lying and deception in dementia care

The debate concerning lying and deception in care for people living with dementia can often become polarized, with some scholars taking a strict stance against lies and deception (Vandemuelebroucke, de Casterlé, & Gastmans, 2018), while others suggest that the use of so-called white lies with people living with dementia can be justified if they adhere to the meaning making practices of the recipients of care (Matthias, 2015; Tuckett, 2004). The scholarly debate is a mirror of actual dementia care practices, in which deception is widely used and, while often accepted, is also controversial and can give rise to ethical dilemmas (James & Caiazza, 2018) and cause care workers to experience moral stress (Gwernan-Jones et al., 2020). In a study of nurses working with people with dementia in Italy, where guidelines concerning lies are lacking, only one in ten respondents claimed that they never used lies (Cantone et al., 2019). Another study of psychiatrists in the United Kingdom showed that 69 % of the respondents had used lies with people living with dementia under their care (Culley et al., 2013). In a British survey of staff in care settings for older adults, 93.3 % responded that they saw benefits with deceptive practices in dementia care, and only 1.8 % stated that they never lied (James et al., 2006). While these studies are based on small samples, they nevertheless suggest that lying and deceptive practices in dementia care are widespread.

Several qualitative studies of deception in dementia care practices also indicate that lying and deception are common practices among doctors, care staff, and family members of people living with dementia. In particular, studies show that deception is widely accepted if it is done with the interest of the person with dementia at heart, and as long as blatant lies are avoided (Gwernan-Jones et al., 2020; Seaman & Stone, 2017). Several synonyms for and practices related to lying can be found in the literature: white lies, deception, and benign manipulation (Hasselkus, 1997); using tricks, going along, distracting, changing the subject, and making up excuses (Blum, 1994); covering up, concealing, keeping, veiling, and not telling (Seaman & Stone, 2017, p. 69–70). While some of these could be read as euphemisms, the long list nevertheless indicates that deception in dementia care is a complex phenomenon consisting of numerous verbal and embodied actions used to both control and care for people with dementia—a set of practices in need of a more fine-grained conceptualization.

Although people with dementia usually prefer to be told the truth about their diagnosis (Russell, 2018), an interview study with people with dementia showed that most of the participants would accept being deceived occasionally, but only if it were in their interest, and as long as those who cared for them used lies based on a thorough understanding of the situation of those they cared for (Day, James, Meyer, & Lee, 2011). However, while care workers caring for people living with dementia as well as the recipients of care may accept deceptive practices to a certain degree, care workers can experience moral stress when deceiving those they care for (Gwernan-Jones et al., 2020). Spenceley et al. (2017, p. 826) observed "a culture of tasks over touch" in a qualitative study of dementia care staff, who testified to lying to maintain a basic level of care when under time pressure. Although the interviewed care workers felt that they needed to lie to people with dementia under their care, it was still something that worried them. Previous research thus suggests that both people living with dementia and those who care for them are ambivalent about deceptive practices. In the UK, some dementia care guidelines adhere to this nuanced way of understanding deceptive practices. The Newcastle Model (Jackman, 2020)—a psychosocial management treatment model for people with dementia that emphasizes the importance of their social environment—suggests that lies can be a tool in interaction to provide comfort if used respectfully, sparingly, and consistently in dialogue between care staff and the relatives of those who receive care. In a report on truth and deception in dementia care, The Mental Health Foundation (2016) also supports the use of lies as a way to empathically follow people with dementia in their own subjective understanding of the world.

While previous research concerning lying in dementia care generally points to the ethical complexity of the matter, the discussion is often less nuanced when it comes to robotic animals: robots are considered deceptive by default, in contrast to humans who can strategically employ a lie in specific circumstances. For instance, The Mental Health

Foundation's report warns that dolls, soft toys, and robot animals may confuse users with dementia and suggests the use of living animals instead of robotic ones, thus sharing a skepticism towards robotic animals with the Swedish guidelines (Statens Medicin-Etiska Råd (SMER), 2014). The robots' capacity "to entice and seduce" (Leeson, 2017, p. 30) is often referred to as "entrapment," a term otherwise used in the gaming industry (Essig, 2012) and in web design (Miller, 2000). By showing that this view of robots as inherently deceitful reinforces a rigid view of a strict distinction between truth and falsehood, disconnected from any lived reality, the current study contributes to the research on lying in dementia care in general and deceit involved in aging with robots in particular. The next section will present the study's theoretical approach, which challenges the understanding of robots as unequivocally duplicitous.

A posthumanist perspective on dementia and robots

Although humanist values have been central to the development of modern care practices, these values also tend "to order sentient beings hierarchically, according to their approximation to the human ideal" (Jenkins, 2017, p. 1494). When a narrow conceptualization of "the human" does not fully encapsulate what it means to live with dementia, it puts the human rights of people living with dementia at stake (Jenkins, 2017; Quinn & Blandon, 2020, p. 37), as they risk losing their status as "normatively human" (Butler, 2004, p. xivf). Accordingly, people with dementia are regularly rendered "outside the realm of the productive, the pleasurable or the democratic" (Quinn & Blandon, 2020, p. 9). Yet, a human being's autonomy is relative, and qualities connected to autonomy, such as independence, characterize only parts of a human's life. As children, we have all been dependent on others for our survival and orientation in the world, and many of us also become dependent on others when we grow old (Jongsma & Schweda, 2018).

Instead of dementia's "narrative of loss" (Quinn & Blandon, 2020, p. 19), dementia can be understood as "a state to be accepted and explored with a view to the meanings it might yield" (Sedgwick, 2013, p. 320), or as Quinn and Blandon (2020, p. 24) put it, "a new and potentially productive form of being." Consequently, Lukić (2023, p. 15) has argued that "dementia might contribute to worlds-making beyond anti-ageist neoliberal agendas of productivity, innovation, and self-realization." The constellation of carer, robot, and the person cared for can produce unexpected, meaningful outcomes, not reducible to an active carer manipulating a passive care recipient with a robotic tool. A posthumanist approach allows for a detailed study of "the uncanniness and stickiness of the intimate" in human-robot interactions that is easily overlooked in science and technology studies (STS) (Latimer & López Gómez, 2019, p. 249).

Posthumanism recognizes the agency and subjectivity of beings found in the margins of, or outside, the sphere of humanity (Wolfe, 2010, pp. 117–119). Barad (2003, 2007) has developed a theory of posthumanist performativity, also referred to as agential realism, placed under a broader theoretical umbrella of new materialism. According to Barad, reality fundamentally consists of phenomena, defined as "ontologically primitive relations—relations without preexisting relata" (Barad, 2007, p. 139). What we usually think of as individual actors using various objects is better understood as components emerging from an essentially inseparable "intra-action," a process in which relations unfold and in which it is only possible to speak of clearly circumscribed subjects and objects retrospectively. The way someone makes a situation meaningful is dependent on an "agential cut," leading to some components being regarded as subjects and others as objects, including the meaning-making subject (Barad, 2007, p. 140). There are both human and nonhuman forms of agency as an agential cut can put either or both as central agents in the unfolding of the intra-action (Barad, 2007, p. 66). Rather than an attribute that someone or something has, "*[a]gency is 'doing' or 'being' in its intra-activity*" (Barad, 2007, p. 178, emphasis in original). Both materiality and meaning "come to matter" only as they emerge from intra-actions (Barad, 2003, p. 817), and in doing so, both matter and abstract concepts can be viewed as agents as they affect the continued intra-action (Barad, 2007, p. 336). Agential cuts have "ethico-onto-epistemological" implications because they have material consequences and change our way of understanding the world, while at the same time, the emerging agencies also have ethical implications for how we ascribe responsibilities (Barad, 2007, p. 185). Thus, culture, nature, technology, and conceptualizations cannot be essentially separated in an analysis of what it means to be an aging person with dementia (Höppner, 2023). Agential cuts often simplify complex phenomena, and the scholarly objective is therefore to remake these cuts and accentuate neglected relationalities—in the current case, by including both technological devices and abstract conceptualizations as potential agents in the analysis (Lukić, 2023).

This approach is in line with an STS approach to artifacts that "does not assume that a technology has a fixed identity outside specific relations of their appropriation and use" (Peine & Neven, 2021, p. 2852). Instead, robotic animals have what Chevallier (2023) calls "ontological flexibility": a chunk of cords, plastic, and fake fur emerges as a robotic animal care robot only through an intra-action of care. In this process, concepts of animality and ideas of cats or dogs will also play an integral role (Redmalm, Persson, & Iversen, 2022). Aging is itself co-constituted with technology, as the use of technology can affect the aging process and one's understanding of it (Cozza, 2021; Peine & Neven, 2021). Aging can thus be seen as a "dynamic change" (Wejbrandt, 2014), a "*multiple, unstable and indefinite*" (Cozza, 2021, p. 81, emphasis in original) transformation that is distributed in networks of humans, technology, and conceptualizations (Höppner, 2023) through which care as a phenomenon can also be understood as "an emergent process" (Cozza, Bruzzone, & Crevani, 2021, p. 310). This approach to the concept of care is influenced by an "ethic of care" (Tronto, 1993)—an ethics that is not guided by abstract principles but realized in a process of trial and error unfolding in actual relationships between the carer and the person cared for. Mol et al. (2010, p. 13) have described care practice as a metaphorical and ethical "tinkering" in the search for "a compromise between different 'goods'" and often also a literal tinkering with chemical substances, measuring equipment, and technological artifacts. Robots can be an active part of this tinkering and engage the user in interaction—previous research has shown that users tend to be more interactive with robotic animals than regular stuffed animals (Moyle, Bramble, Jones, & Murfield, 2018). Yet, whether deception is part of these interactions is an empirical question that must be answered through observations of the intra-active tinkering through which agents emerge. In line with Stacey and Suchman, (2012, p. 24) strategy for studying automata in STS, paying close attention to everyday tinkering is a way "to slow down the rhetorics of life-like machines and to attend closely to the material practices of their realization" and to open up for a discussion concerning "what conception of life and liveliness is in play" in the use of robots in nursing homes for people with dementia.

A posthumanist perspective responds to several challenges in research on deception in dementia care. First, the use of the word "lie" in relation to dementia care practices has been criticized because it is morally loaded (Russell, 2018) and because it is too narrow and excludes subtleties such as leading questions, evasiveness, looks, and gestures (Schermer, 2007, p. 15). A posthumanist perspective does not presuppose that deception is simply a matter of a liar manipulating a passive recipient, but instead studies it as something that emerges from intra-actions where not all agents are necessarily human. Second, posthumanism's understanding of the self as fundamentally relational responds to scholars' call for a revised understanding of self-identity in relation to dementia (Lukić, 2023). Although people with dementia may lose their episodic self, a person's self-image can still be maintained through their relationships, their habits, and their moral self-orientation (Matthews, 2020). Third, a posthumanist approach challenges the idea of "time as a succession of evenly spaced moments" (Barad, 2007, p. 179) and pays attention to the "different time-space" (Lukić, 2023, p.

14) or "plural temporalities" (Höppner, 2023) that emerge through intra-actions. The linear understanding of lie—deception—disclosure can be difficult to grasp for someone with an episodic memory impairment (Schermer, 2007). Furthermore, interactions with people with dementia are often retrospective, where the question of who the person was before the diagnosis guides the interaction (Jongsma & Schweda, 2018). These posthumanist insights guide the study's methodological approach.

Methodological reflections

Care interventions for people with dementia generally aim to increase functionality of people living with dementia, often with a focus on improving their capacity to remember (de Medeiros & Basting, 2014, p. 344). These interventions tend to be evaluated based on measurable impact—in the case of social robots, quantifiable factors such as for example behavior (Liang et al., 2017), stress (Wada & Shibata, 2007), or blood pressure (Robinson, MacDonald, & Broadbent, 2015). Deception, in contrast, is a more ambiguous outcome from the use of robots and is not easily measurable. Therefore, the present article aims to nuance the understanding of lying in dementia care by identifying and analyzing intra-actions involving robots in which ethical ambiguities arise. The nursing homes included in the study used cat and dog robots from one and the same manufacturer, Ageless Innovation's Joy for All Companion Pets, which are cheaper and technologically simpler than Shibata's Paro. It can be argued that these simpler robots do not raise ethical concerns to the same extent, as they do not create the same kind of elaborate illusion of a living being (Blackman, 2013). However, as we discovered during fieldwork, some residents nevertheless seemed to perceive the robots as real animals (Iversen, Persson, & Redmalm, in press; Persson, Ferm, Redmalm, & Iversen, 2023).

The study is based on fieldwork between 2020 and 2022 in six nursing homes in Sweden for people with dementia. Qualitative interviews were conducted with 44 care staff members, four managers, and eight care technology experts working strategically with technology implementation in dementia care. In addition, some interactions between care staff and residents involving robots were video recorded, amounting to a total of 211 min of recorded material. The staff members were either certified assistant nurses or nursing assistants without a specific education. The nursing home visits lasted between one and five days, and interviews spanned from 20 to 70 min. Participants who agreed to be interviewed or video recorded were given an information sheet about the study and signed a consent form. We also made sure that people we interacted with more briefly during our fieldwork were informed that we were researchers studying the use of health and welfare technology (Schuster, 1996). The project plan was vetted by the Swedish Ethical Review Authority (no. 2020-01853).

The interview questions included both general inquiries about the interviewees' work and the nursing homes they worked in and questions specifically concerning their experiences with using robotic animals. The questions focused on how robots were used, how they were perceived by care staff, and how nursing home residents reacted to them, to allow for different ways of discussing how robots can create the illusion of real, living animals. Questions about deceptive practices were not included in the interview guide but emerged as a theme during the analysis of the initial interviews. Therefore, during the later stages of the fieldwork, we would ask follow-up questions concerning deceptive practices in relation to the robots, guided by the initial results. Given the many synonyms for and practices related to lying identified in previous research about deceptive practices in dementia care (Blum, 1994; Hasselkus, 1997; Seaman & Stone, 2017), we were attentive during the interviews to the different ways in which this topic was broached. Interviewees brought up issues related to deceptive practices using a variety of terms, such as lying, white lies, pretense, and following.

Through an initial thematic analysis (Braun & Clarke, 2006; Vaismoradi, Turunen, & Bondas, 2013) we noted that a few employees stated that they generally were truthful with people living with dementia under their care, others said that they never lied, but would sometimes "follow" the fantasies of those they cared for, and yet others recognized that they used lies in their work with people living with dementia. Accordingly, we began categorizing the empirical material according to these different strategies concerning truth and deception. In this process, we gradually realized that all three strategies—being truthful, following, and lying—were compromised in different ways. "Truthful" care staff members would sometimes find themselves in situations where it was virtually impossible to thoroughly explain the robots' constitution and functions to residents. In these situations, they often treated the robots like they would treat real, living animals and thus recognized that they were not completely truthful with the residents. Similarly, the "followers" regularly treated the robots as living animals if the nursing home resident did so and were consequently deceiving residents through their actions. Finally, staff members who said that they regularly told straightforward lies still said that they had to lie with care, since residents would not accept any lie, and since excessive lying could cause stress and confusion. This meant that a strategy of lying in many ways also implied an attentive following—a constant concern with the lies the residents accepted and which they did not. Through further analysis, we noticed how different kinds of deceptive actions could be observed in different situations, and therefore we instead categorized observations and interview accounts based on various ways of using the robot.

With this new focus, four intra-active phenomena emerged from the material: *the cuddle*, where simple, embodied actions are in focus; *the comfort*, where the cat is used as a resource for distraction and emotional support; *the conversation*, by which robotic animals' agency is both established and challenged; and *the adoption*, through which narratives and props are used to give the robot the status of a pet. In line with a posthuman approach, the focus in the analysis is on relations and exchanges rather than attempting to speculate whether users really think that the robots are alive or not (cf. Quinn & Blandon, 2020, p. 36).

Results

Four intra-actions were identified in which robotic animals play a part: the cuddle, the comfort, the conversation, and the adoption. While these intra-actions can be analytically separated into distinct categories, a single intra-action can take on the character of two or more of these four categories.

The cuddle

Cuddling with the robots—holding them, patting their heads and backs, and stroking their fur—was a common way in which the robots were used. Although people can cuddle with objects, staff members' way of cuddling with the robots implied that they were living creatures, through the way they held the animals and how they sometimes talked to them. This impression was enhanced by the robots' black box design: their technological components are well hidden, including the battery slot and power switch covered by a flap of fake fur. Some staff members we talked to had developed a smooth maneuver through which they were able to secretly turn on the robot—suddenly exposing the battery cover and power button would be "cruel" to a resident orienting towards the robot as if it were real, as an assistant nurse pointed out.

Some nursing home residents' expectations that the robots would act like real animals guided the care staff members' handling of them. One of the members of the research team was reprimanded by a resident for carrying the cat by the neck: "That's not how you hold a cat." Staff members told us of similar situations—one nursing assistant was once loudly told off when she handled a robotic dog rather roughly: "I definitely shouldn't have done that, so now it's like lifting a child." In one nursing home, the staff would regularly crouch beside residents whom they knew enjoyed the company of the robots and then carefully toss a cat robot into their lap—something that was usually appreciated as it produced the illusion of a cat choosing to jump into the resident's lap. These kinds of maneuvers demanded some "dexterity," as an assistant nurse explained. Yet, the handling of the robot as a real animal seemed to have become natural and habitual to many of the care staff members. To present a robotic animal as an animal to cuddle with, the staff members needed to treat the robots as "cuddlable" through their own touch—a mutuality central to the cuddle as intra-action.

An assistant nurse, who was also a technology consultant for nursing homes in her region, said that transparency was central when robotic animals were introduced and gave an example of what she would say to a resident: "Look here, this is new technology, it's a robot that looks like a cat, do you want to pet it?" Yet, she also acknowledged that many of the residents she met would quickly forget her initial words: "You could be introducing this [robotic] cat several times a day because they have forgotten what it is and why it's there." Thus, in the actual intra-action the very idea of transparency is challenged, as there is no clear point at which transparency is secured in relation to a person with dementia. The transparence of the very concept of transparency is often taken for granted in policy documents, but in practice, examples like these highlight the difficulty of consistently adhering to an ideal of transparency productive. More commonly, care staff members were vague about the robot's nature. This vagueness was often productive: the robotic animal became a joint project, something to make sense of together. In one videorecorded sequence, an assistant nurse introduces a robot by addressing a resident: "Have you seen this, [name of resident]?" The resident begins petting the robot's ear and asks, "Is it alive?" and then answers her own question: "No." The assistant nurse does not attempt to explain the robot's function and thus leaves some room for ambiguity. The resident then turns her attention to the robot and says, with emphasis, that it is beautiful. When the robot meows, she acts with amazement: "Oh dear!" The kind of vagueness exemplified here was described by the interviewees as "playing along," "following," or joining their "their world," "their way of thinking," or "their reality."

The video-recorded material documents several situations like this one, where care staff members and residents cuddle with robotic cats and dogs and respond with excitement when robots react with sounds and movements—even when it is obvious that all involved know that they are cuddling with a robot. A nursing home manager said in an interview that one resident had said about a robotic cat: "I know it's not real, but it's still fun." A member of the research team observed a similarly ambiguous attitude when having coffee with two residents. When a member of the staff placed a cat in the middle of the table, one of the residents showed no interest whatsoever, while the other, unimpressed, explained that the cat was not real. She showed how to stroke the cat—first on the head, then under the chin—to make it lie down and then meow. The resident had obviously observed the cat's behavior before and had by now decoded its algorithm. Yet, when the cat lied down on its back and meowed as predetermined, the resident turned to the robot and talked to it: "Oh yes, oh yes!" The cuddle was still a meaningful gesture for the woman, although she knew that the robotic cat did not actually have a subjective experience of it. In the situation, the robot emerged as an agent, and the research team member and the resident both became engaged in the cat's expression of wellbeing, although nobody involved engaged in an intentional act of deception.

However, "the uninformed cuddle," when care staff members treat robots as real without explicitly naming them as such, involves interpersonal risks. Every now and then, users would express that they felt tricked and take offense when realizing that the cat or dog were, in fact, robots. One assistant nurse especially remembered one session during which a resident got worried when studying a cat robot's ears. The resident first suggested that the cat should be taken to a veterinarian, but then realized that the cat was not real after all and confronted the assistant nurse: "Why are you trying to trick me?" The assistant nurse then realized that, in this case, it would have been better if she had been clear about the robot's character right away.

Through the embodied act of the cuddle, a piece of plastic covered with fake fur, with relatively simple machinery, can gain a unique status. The very potential of the robotic animal to emerge as a real cat or dog through intra-active cuddle shapes the postures and movements of carers as they act habitually around the robot as if it were real, thus in turn most probably facilitating users' experience of robots as real animals. As such, the cuddle has the potential to become "a form of material poetry formulated through the body" (Quinn & Blandon, 2020, p. 54)—an intra-action that is not focused on utility, but is meaningful for agents emerging from it, thus sidestepping "anti-ageist neoliberal agendas of productivity" (Lukić, 2023). This creative productivity was also seen when users had an ambivalent approach to the robotic animals—they could sometimes attribute agency to a robot through the way they acted towards it, even when describing it as a passive piece of machinery. This makes it difficult to locate the exact point of deception: although care staff members have access to more information in these contexts, simply telling it like it is would, in many cases, collide with their view of ethical care, and go against what would feel natural in the situation. Deception can thus be said to emerge from the cuddle, rather than from care staff members' active decision to lie to a person with dementia under their care.

The comfort

Several of the interviewed care staff members described how the robots could be used to provide comfort and reassurance to residents who used the robots regularly—an effect that has been measured in previous research (e.g., Robinson et al., 2015; Wada & Shibata, 2007). A few of the interviewees also said that they could sometimes use the robots instead of medication when a resident suffered from anxiety and explained this with reference to the way robots would attract users' attention and distract them from stressful situations.

During our fieldwork, we learned of several residents who were especially attached to a robotic cat or dog. With these people, the robots were often key to resolving difficult situations. One resident who regularly acted out against staff members, screaming and throwing things, would calm down when she had a robotic dog in her lap. She never threw away the robot—in her eyes, the robot was not a "thing," according to staff members who cared for her. The woman often refused showering, but if they first brought the dog to the bathroom, she followed along, and the staff members could then help her to shower while talking about the dog sitting beside them. A staff member therefore described the robotic dog as her "lifeline." During a visit to her room by one of the researchers, the resident showed great affection for her dog. She talked about how much she appreciated her dog and said, "I would never do him any harm." The robotic dog seemed to provide comfort because she perceived the dog to be in need of care. In other words, the cared-for nursing home resident here emerged as a carer in relation to the robotic dog.

However, for some users, the robots' perceived need for care could become a burden, especially when they were barking or meowing. One assistant nurse explained that some residents would begin to worry when the ward's robotic cat began meowing—that it was hungry or that it needed help. Instead of providing comfort, in these cases, the robotic animals were perceived to be in discomfort, and in need of comfort. An assistant nurse told of an incident when staff members forgot to turn off a woman's cat in the evening, which kept the resident awake all night. After the incident, the assistant nurse turned the robot's machinery off permanently. This only made the resident even more attached to her robot. The assistant nurse said that the resident often complimented her cat, saying things like, "This is the nicest cat in the world, and he lies there, and he sleeps, and he is so kind." One of the researchers was invited to visit her room and could see pillows, embroidery, and paintings with cats on them, as well as a cat toy on her sofa,—it was clear that she had a history with cats, and the cat robot was a way for her to connect to her past as a cat owner. The cat comforted her, not because of its algorithmically activated movements and sounds, but because she had an embodied and cultural relationship to cats as a "companion species" (Haraway, 2003; Redmalm, Persson, & Iversen, 2022).

In contrast to the cuddle, where both the resident and care staff member try to yield a reaction from the robot, the comfort prevents users from feeling anxiety and other negative emotions and diverts them from aggressive behaviors. The comfort is usually initiated by the care staff member, while the robot emerges as an agent by the way it looks, feels, moves, and sounds. The residents' history with animals, and their general ideas of and associations with cats and dogs will shape the robotic animals' agency in these situations. But robots can also be too active: once the agential cut is made in a way that attributes agency to the robot, its actions may lead to unforeseen consequences, for example, by enhancing someone's anxiety through its intrusive, persistent sounds. The care staff members' way of strategically shutting robots off is a kind of tinkering, not only with the robot but with the relationship between robot and resident, bringing back an unruly robot into the fold to hopefully restore its calming and comforting effect.

The conversation

Robotic animals have been shown to facilitate conversations and increase interaction between care workers and the people they care for (Liang et al., 2017). A focus on conversations may be seen as anthropocentric as it presupposes the capacity of verbal communications (see Quinn & Blandon, 2020, p. 16). Yet, animals are also in various ways pulled into human conversation and affect it through their presence, actions, and vocalizations (see, e.g., Tannen, 2004). For instance, humans often repeat pets' vocalizations (Harjunpää, 2022), which was something we recurrently saw residents doing in response to robotic animals' barking, meowing, and purring. By doing so, they adjusted their actions to the robots' prosodic expressions and showed other human interlocutors how they heard the robots.

Several of the interviewed assistant nurses and nursing assistants confirmed that robots spurred conversations with residents—the robots' presence would open up conversations about dogs and cats that residents had lived with in the past. Conversations were also had about the robots in front of them, for example, about how the robotic animals were doing or if they had eaten today. Staff members engaging in such conversations would thus intimate that the robots were real animals. Some of the care staff members referred to this way of talking about the robots as "white lies"—one staff member even said that it was outright lying. Yet, as several of the interviewees pointed out, this was the most reasonable thing to do when residents approached the robots as real animals. An assistant nurse explained:

> They regard them as living. If I were to say, like, "But that's not a real one," then they would've been like, "What?!" Then they get more stressed, so you have to talk with them as if they were real and like, "Have you fed it today then?" "Yeah, he's eaten loads of food," they can say then.

Some interviewees downplayed these lies by comparing them to the other lies they told regularly in conversation with residents—for instance, saying that a family member or relative asked for repeatedly would visit "tomorrow" or using different kinds of deception to make residents take their medication. We witnessed a few such lies in everyday situations in nursing homes, and these were used seemingly spontaneously, usually at times when residents were anxious or upset.

Robotic animals also enabled non-verbal exchanges to take place between care staff members and residents: gazes, winks, and facial expressions. One of the researchers visited a nursing home at which a resident had a robotic dog with her most of the time, often carried in the basket of her walker. The robot was usually turned off when she came into the common room, and the staff turned it on when she was about to sit down. The resident used only short sentences, but when the robot dog started barking, she usually looked up, wide-eyed with a surprised expression, and sought eye contact with other people in the room. Care staff members sometimes responded with a similar, affirmative expression. The researcher also engaged in this exchange of facial expressions on several occasions and described in the field notes how it would have been impossible not to reciprocate the enthusiasm. The robotic dog here enabled a shared emotional moment and an exchange that would not have taken place, at least not in the same way, without it. When the staff, as well as the researcher, engaged in these exchanges, it could be seen as pretense, as there was nothing surprising about the robotic dog's barking. This showed the difficulty of separating truth from lie. It also highlighted how difficult it generally is to avoid fueling the illusion of robotic animals as living beings, as even a glance can make all the difference in certain contexts.

Sometimes the conversations would fall flat. Usually, this happens when there is a disagreement among the residents about a robot's ontological status. An assistant nurse, who in the interview warned against using technology as a quick fix in dementia care, described a reaction to the robots that she regularly got: "Some say right away that that's a toy, and then it's just goodbye: 'Seriously, who is going to play with that thing?'" Such reactions could create a divide between those who viewed robots as passive objects and those who approached them as agents. At other times, users would just not show interest in the robots—during our fieldwork, staff members sometimes actively encouraged residents to engage with the robots for us to see how they were used, and it was not uncommon for attempts like these to fail and the robot to be dismissed as a "gadget" or "toy." In such cases, the resident emerges from the intra-action as an agent resisting engagement, whereas the robot is never involved as a party in the conversation and is dismissed as a passive object.

To sum up, the posthumanist analysis of conversations in relation to robotic animals showed how robots' animated liveliness—their presence, sounds, and movements—enabled conversations, but also how the robots could provoke users to dismiss or distance themselves from the robots if they were perceived as an unsophisticated technological device. In both cases, intra-actions would generate conversations, albeit of a very different character. In these intra-actions, even small conversational cues, such as facial expressions, could support the illusion of the robot being a living, sentient animal.

The adoption

While the cuddle, comfort and conversation were demarcated in time and space, a fourth intra-action was multi-sited and stretched out over time: the adoption. The nursing homes we visited had purchased robots for their wards—communal robots for everyone to use. However, some residents brought a robotic cat or dog to their rooms, and treated it as their own, something that the staff members usually allowed them to do. It was the residents who took the initiative to care for the robots, but then residents and care staff members began a mutual job of building up a story around the robot. To keep this story consistent was a communal task—"it's very important that we staff members say the same things, so things don't go wrong," as an assistant nurse put it. This would sometimes be accomplished with the help of props; some staff members had helped residents by buying food and bowls for the robotic animals. One assistant nurse had also bought a leash for a resident's robotic dog, which led her to go out for walks with the dog in the walker. For dog owners, much of the contact is mediated through a leash, and Michael (2000) has argued that it is possible to analyze the human-leash-dog constellation as one single "co(*a*)gent." In the current case, material objects like leashes and food bowls became part of conjuring up the robotic pet as a real animal and the resident as a pet owner. When introduced by care staff, the props help to establish and maintain the user's intimate bond with the robot, highlighting the way "intimacy is made of and with multiple entangled materialities" (Latimer & López Gómez, 2019, p. 254).

The robots' background stories would sometimes change depending on a resident's capacity to remember. For example, during our fieldwork, the name of a resident's dog changed from day to day. Despite the name changes, the resident would regularly come back to the dog's background story—according to the resident, she had become the dog's guardian after her mother could no longer take care of him. Focusing on memories can be a way to cope with the confusion in the present that dementia can cause (Quinn & Blandon, 2020, p. 48), but in this case, an imagined memory became something to hold on to and created continuity in her life at the nursing home. The resident, usually cared for by others, emerged from the adoption as someone caring for another being, highlighting her agency in a context of dependency.

It became clear during our fieldwork that the robots aged—we saw some rather worn robots, as well as robots that had stopped working. Because of the close connection between some residents and their adopted robotic animals, it could be a challenge when a robot needed cleaning or when it broke down. Staff members had found ways of sneaking robots away to wash them when their owners were occupied with other things. However, the woman who used her robotic dog as a "lifeline" always had it with her for comfort, and therefore, it was difficult to find opportunities to clean the robotic dog. "In her world, it is a real dog, and it's her dog," a nursing assistant explained, and therefore she could get upset if her dog was suddenly gone. However, the robotic dog needed a regular wash since the resident often "fed" it—when a member of the research team visited her room, the robot had dried-up cheese and bits of sausage in its mouth. To tackle this problem, one assistant nurse had the idea to simply swap the dog with an identical one when needed. Having an identical spare dog proved to be invaluable when the dog broke down, which had happened two times prior to our visit. Baudrillard (1998) has pointed out how consumer capitalism is based on the idea that an object can be mass produced while still being perceived as authentic and unique. In this case, the fact that the robots are industrially manufactured makes it possible to quickly replace them, which in turn facilitates residents' perception of the robots as unique, irreplaceable companions, kept over longer periods of time.

One resident had adopted not only a robotic and cat dog, but several other stuffed toy animals that she had found in the ward and brought back to her room. "When we tried to bring them out again," said an assistant nurse, "she came out and like, 'Oh, look, there's my dog' and then she took it back again." A member of the research team visited the resident briefly in her room together with a nursing assistant, and when asked about her dog, the woman shone up and showed it, allowing the researcher to pet it. The nursing assistant explained that no one has asked for the animals that kept on disappearing from the common areas, so the staff let them stay in the resident's room with the argument that we all need to have some fun in life, as she put it. It did happen occasionally that two different residents tried to adopt the same robotic animal, but these conflicts could usually be resolved, if nothing else, by simply purchasing an additional robot. Here it can be pointed out that while apathy and passivity are common symptoms of dementia (Gilmore-Bykovskyi, Block, Johnson, & Goris, 2019), the woman collecting animals in her room as well as many other residents in the study engaged regularly in active efforts to care for the robots.

In this section, we have shown how the residents treat the robots as real companion animals, while staff members engage in an active effort to enable that conception through what Stacey and Suchman (2012, p. 28) talk of as the "invisible labours of maintenance and care that even robots require." The washing, repair, and replacement of dirty and broken robotic animals are actions invisible to the user, but central to the experience of a robotic animal as a unique, sentient, and living being. At closer inspection, other agents also emerge from the adoption as intra-action. The introduced props helped give the experience of having a companion animal a sense of continuity and context. A successful adoption is also enabled by the robots' design and even the dynamics of consumer capitalism. Last, for some of the residents, this intra-action also encouraged them to take initiative in caring for the robots, and allowed them to emerge as agents of care from the intra-action.

Conclusion

In this study, we have relied on a posthumanist approach to dementia, aging, and care (Cozza, 2021; Cozza et al., 2021; Höppner, 2023; Lukić, 2023; Quinn & Blandon, 2020) to show how both human and nonhuman agents emerge from several different intra-actions: the cuddle, the conversation, the comfort, and the adoption. These intra-actions are sometimes demarcated in time and space and at other times intertwined, as cuddles can lead to conversations and adoptions can enable comfort in ways not limited to a particular place or moment in time. Having identified how robotic animals emerge as agents and as seemingly living, sentient beings in care practice, we offer a new angle in the discussion about deception in dementia care.

With a posthumanist approach, we have shown the different ways in which robotic animals' liveliness emerges in caring intra-actions and how this liveliness is sometimes questioned or challenged in other ways, thus highlighting the robotic animals' "ontological flexibility" (Chevallier, 2023). By doing so, we have challenged the idea of robotic animals as inherently fraudulent objects built "to entice and seduce" (Leeson, 2017, p. 30)—a view that can be found in policies concerning robotic animals (The Mental Health Foundation, 2016; Statens Medicin-Etiska Råd (SMER), 2014). According to these policies, the robots' deceptive design poses a threat to the personal integrity of people with dementia. But being able to tell a real animal from a robotic one is not necessarily central to one's sense of self (Matthews, 2020). Posthumanist scholars have criticized how a humanist conception of personhood based on the idea of the autonomous, rational subject marginalizes people with dementia (e.g., Cozza, 2021; Quinn & Blandon, 2020). The lie—deception—disclosure chronology presupposes an intact episodic memory and is therefore not always applicable in dementia care, as someone with dementia may not fully understand a disclosure or may quickly forget it (Jongsma & Schweda, 2018; Russell, 2018). As Matthews (2020) has pointed out, people struggling with their episodic selves may still maintain a self-image through their relationships. In support of this, our analysis showed how some residents maintained a notion of themselves as devoted pet owners through acts of care for their robotic pets, in which the robots were treated like real animals. Thus, while there are concerns that robots can put one's personal integrity at risk (Blackman, 2013), they may also be tools for maintaining one's personal identity. The fabricated biography of the robotic pet can be seen as an alternative chronology available when someone has difficulty comprising a biographical account. The analysis therefore contributes to the posthumanist problematization of a linear conception of time in social relationships (Barad, 2007; Höppner, 2023; Lukić, 2023).

A central aim of a posthumanist analysis is to bring forth otherwise neglected agencies by offering alternatives to established agential cuts (Barad, 2007; Cozza et al., 2021; Lukić, 2023). In the current case, we showed how the joint work of human and nonhuman agents—concrete and abstract—generated and maintained the illusion of a robotic animal as a living, sentient animal. The resulting illusion is not best understood as a straightforward, one-way rational manipulation of one actor by another actor, but as the outcome of an intra-action involving human and non-human agents. The analysis thus also contributes to a posthumanist critique of the unreflective humanism often underpinning dementia care (Jenkins, 2017; Quinn & Blandon, 2020). Such an approach does not imply that all agents are equal. The role of the care worker is still associated with a greater number of possible lines of action and can, unlike a person living with severe dementia, switch between their own and users' different understandings of the robots. However, the analysis of the cuddle, the comfort, the conversation, and the adoption shows that care staff members often adjust the way they approach the robots in nursing homes to the residents' way of acting towards the robots. Although a care staff member theoretically can expose the robot's true qualities to a resident who is treating the robot as a living being, this possibility is rarely acted upon in a relationship of care in which the care recipient's interests are in focus.

A posthumanist approach safeguards against rough and over-simplified agential cuts by engaging in an ethico-onto-epistemological exploration of the world—by showing how materiality and meaning-making are connected to ethical concerns. By "cutting up" deception into qualitatively separated intra-actions from which different agencies emerge, the analysis sheds new light on deception in dementia care. Treating lies and deception in dementia care in a binary way—as a question of whether or not to lie—ignores the many ways in which fantasies, illusions, and playful pretending emerge from complex interplays between both human and nonhuman agents, often in the interest of the person cared for (Day et al., 2011; Seaman & Stone, 2017).

In a care setting where using deception is an established practice and where life-like robotic animals are widely used, it is difficult to point to individual care staff members as solely responsible for creating the illusion of the robots as living, sentient animals. Yet, there is a risk that the relatively strict guidelines in Sweden concerning deceptive practices in dementia care in general, and in relation to robots in particular, move the full responsibility for maintaining transparency onto care workers in a context where many agents will not be able to grasp the full meaning of transparency. As argued in this article, transparency is itself an all-but-transparent concept, as it is not clear what transparency would mean for a person with severe dementia. A related and more general point is that few fully grasp the nature of the technological devices they use daily—whether they live with dementia or not—which means that transparency is always relative to the specific context in which the device is used. The discrepancy between policies and practice results in ethical dilemmas that are up to care workers to resolve. In this article, a posthumanist approach has enabled a redistribution of some of this responsibility by showing how deception can be understood as a relational phenomenon emerging from intra-actions involving robots, nursing home residents, care staff members, and abstract concepts.

Ethics statement

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CRediT authorship contribution statement

David Redmalm: Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Clara Iversen:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Marcus Persson:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

None.

Data availability

The data that has been used is confidential.

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