



The Woman with the Dog: Relationships between Pet Robots and Humans in a Danish Nursing Home for People with Dementia

Simone Anna Felding,^{1,2} Prof. Lena Rosenberg,^{3,4} Dr. Karin Johansson,³ Dr. Sonja Teupen,^{1,2} Prof. Dr. Martina Roes^{1,2}

simone.felding@dzne.de

¹ German Center for Neurodegenerative Diseases (DZNE), Witten, Germany

² Faculty of Health, School of Nursing Science, Witten/ Herdecke University, Witten, Germany

³ Division of Occupational Therapy, Department of Neurobiology, Care Sciences and Society, Karolinska Institutet

⁴ Department of Rehabilitation, School of Health and Welfare, Jönköping University

Abstract

In this article, we explore how pet robots come into being in a Danish nursing home for people with dementia, based on five months of ethnographic fieldwork. We argue that the researcher and the robot become an assembled temporary figure in the nursing home: *the woman with the dog*. We show how pet robots are characterized by their fluidity and can go from being mechanical robots to living animals in a matter of seconds during interactions with nursing home residents. The social robots are fragile technologies that disappear and cease to be used if people in the nursing home stop caring for them. Through relationships, the pet robots come into being together with other actors in the nursing home – a process that requires tinkering (Mol, Moser, and Pols 2010) and flexibility from those working with the robots. We argue that *the woman with the dog* can develop caring relations with the residents, but although there are hopes that pet robots are one of the technologies that can save a welfare state and care system under pressure, this is not something that can be done by the pet robots alone. Rather, the robots need care and tinkering to become embedded in the nursing home.

Keywords: *Dementia; Social robots; Care; Nursing homes; Denmark*

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Simone Anna Felding,^{1,2} Prof. Lena Rosenberg,^{3,4} Dr. Karin Johansson,³ Dr. Sonja Teupen,^{1,2} Prof. Dr. Martina Roes^{1,2}

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Introduction

Petra asks me if the dog has to pee. Do I have a diaper for it, or how is it handled? I tell her that the dog does not need a diaper. “Do you then just take it outside in time?” she asks me. I tell her that I do. She asks me how long I have had it. I feel like the pet robot has now become a real living dog. Petra cares for it, helps it stand up straight, keeps an eye on it. She asks me if it has fallen asleep. Then, she suddenly says, “There must be something stiffening inside that doll. Isn’t there?” (Fieldnote; December 15, 2021)

Social robots, including pet robots, for older adults and people with dementia have received much attention in recent years, and many funds – both private and public – are going into the development, evaluation and testing of social robots. There is a belief that social robots will be an important tool to meet the growing need for dementia care, acknowledging present and future demographic changes and an aging population (Wright 2023; Leeson 2017; World Health Organization 2022). In this paper, we focus on pet robots implemented in a Danish nursing home for people living with dementia. We will provide a brief overview of nursing homes in Denmark, the use of assistive technologies and the introduction of social robots into nursing homes, before presenting methods and results from our study.

In Denmark, it is common for people with dementia to enter nursing homes as their dementia progresses. It is estimated that more than 60% of all residents in nursing homes have dementia (Ældre Sagen 2019). Thus, Danish nursing homes frequently become part of the disease trajectory for people with dementia. Some nursing homes offer integrated dementia care units, where dementia care is provided in nonspecialized nursing homes, and others have segregated units, specialized in dementia care where all residents have a diagnosis of dementia (Palm et al. 2019).

Providing dementia care is part of the social contract of the Danish welfare state, a universalist welfare system that is widely accepted and strictly shapes the average life trajectory in Denmark (Jöhncke 2011). It is one of the most decentralized welfare states in the world, where municipalities have many administrative competencies (Ploug, Henriksen, and Kærgård 2004). The municipalities are responsible for nursing homes and make decisions concerning, for example, how they are operated and which technologies to buy.

In Denmark, assistive technologies are called welfare technologies – a term that refers to the digital transformation of the welfare provided by the state (Frennert and Baudin 2019). These technologies are

seen as pertinent to how care will be provided in the future. Denmark invests heavily in these technologies based on a political consensus that there is great potential in improving eldercare and making it affordable and sustainable in a welfare state under pressure. Further, investing in these technologies is considered a potential business venture for private companies as well as an investment that will reduce expenditures for the welfare state (Leeson 2017; Aaen 2022, 23-8).

One of these welfare technologies is social robots. Behavioral psychologist Arlene Mannion and colleagues. (2019) define social robots as “robots that have social skills which enable them to communicate with human users in an acceptable manner” (Mannion et al. 2019, 535). There is no universal definition, but most definitions emphasize social interactions and communication with humans (Mannion et al. 2019; Frennert and Östlund 2014; Blond 2019). Social robots are present in nursing homes in Denmark and across the world (Felding et al. 2023). *Paro* – the robot seal – has been one of the most widely used and researched social robots and is often used with people with dementia in Danish nursing homes (Hung et al. 2019; Koh, Ang, and Casey 2021; Budak et al. 2023). Other pet robots, such as robotic dogs or cats, are also used but to a lesser degree. Humanoid social robots have entered nursing homes as well, albeit on a smaller scale. They have been tested in Danish nursing homes (Blond 2018; Leeson 2017), but to our knowledge, they are currently not in use.

Social robots for older adults have received much research interest beyond the social sciences with studies and reviews about their development and effectiveness, as well as their performance in labs and implementation measures (Scerri, Sammut, and Scerri 2021; Koh et al. 2021; Felding et al. 2023). There remains, however, limited knowledge regarding what happens when robots are introduced as a regular part of everyday life. To date, there have been few ethnographic studies of social robots in elder care (Blond 2018; Leeson 2017; Chevallier 2023). There is a need for more qualitative research on the subject, as the implementation of social robots depends on the social interactions of human users and therefore must be studied in real life, embedded in situated practice (Strandbech 2018; Blond 2019; Wright 2023).

Using ethnographic methods, the aim of this study is to understand how pet robots are embedded in everyday practices in a nursing home for people with dementia and what and how they become in the nursing home. Throughout the paper, both the pronouns ‘we’ and ‘I’ will be used. ‘We’ refers to all authors and the collective process of interpretation and writing behind this article. ‘I’ refers to the first author, who conducted the ethnographic fieldwork.

Ethnographic Methods

Working ethnographically with people with dementia

Doing qualitative research with people with dementia involves specific methodological considerations – especially when they are in moderate to late stages of dementia, which was the case for the residents in the nursing home. People with dementia often develop aphasia or other language difficulties (Suárez-González et al. 2021) and may have difficulties presenting coherent narratives as well as verbalizing their position on the research (Driessen 2019). Anthropologists Ida Marie Lind Glavind and Hanne Mogensen (2022) argue that ethnographic methods have the potential to capture nonverbal interaction and communication, which is crucial to understanding and writing about people with dementia in research.

The familiarity that comes from sustained interaction during participant observation made it possible to include people with dementia in research, a group of people who have previously been excluded for many years (Toubøl et al. 2020; Gjødsbøl and Svendsen 2018). Glavind and Mogensen argue that the fieldworker must remain attentive toward and participate actively in the “fragile storytelling” of people

with dementia. This entails listening and allowing for silences and topic changes but also filling in where needed and helping people with dementia communicate. People with dementia may lose words as well as a sense of time and place, but still try to tell stories and communicate. Knowing the person over time makes it possible for the researcher to guess and fill in the blanks helping their stories unfold (Glavind and Mogensen 2022). Anthropologist Tyler Zoanni (2018) uses the term ‘signature’ to describe the recognizable traits of a person who may not be able to verbalize who or how they are as a person but nevertheless have something that sets them apart.

By ‘signature’ I mean a distinctive, embodied mark of being in the world, an imprint or an impress, elaborated and stabilized through living in relation to others. Signatures, of course, are not always clear or easy to read, nor are they necessarily consistent. But they are recognizable, and they have a kind of currency and circulation that makes them socially legible and establishes their bearers as social persons. (Zoanni 2018, 72)

Part of doing anthropology with people with moderate to late-stage dementia is to remain attentive to the signatures of people and participate in their fragile storytelling.

The design of the fieldwork was inspired by sensory ethnographic methods as described by anthropologist Sarah Pink (2015), which include reflective practices of the researcher’s own positioning and sensory and emotional experiences in the field. As described above, people with dementia cannot always communicate clearly through words, but this does not mean that they cannot communicate. Nonverbal communication is crucial in these interactions and is experienced through interconnected senses that cannot be separated but add up to an understanding of what the person is communicating. This became especially clear when analyzing transcribed interviews with people with dementia whom I understood clearly in the interview situation, but later when reading the transcripts, I found parts of the written text incomprehensible. Here, sensory ethnography helps us grasp what otherwise remains unintelligible (Pink 2015). Following Pink, I reflected on these experiences during interactions and communications including them in the written fieldnotes, analysis, and in this article.

The ethnographic fieldwork

This article is based on five months of ethnographic fieldwork carried out from September 2021 to January 2022 in Frydendal (pseudonym), a public nursing home for people with dementia in Denmark. Access to the nursing home was gained with help from the municipality, which identified a suitable nursing home and established the initial contact. The primary method used in the fieldwork was participant observation. The fieldwork covered different times of the day and different times of the week to obtain an understanding of the daily rhythms in the nursing home and obtain a broad view of everyday life. During participant observation, I had many informal conversations with residents, staff, and relatives, mainly in the common areas of the nursing home and sometimes in residents’ flats, if I was invited. In Denmark, the vast majority of nursing homes are publicly funded (Gjødtsbøl 2017), and residents usually have their own private apartments, with a bedroom, a living room and a bathroom. Flats are organized within units, which are usually relatively small, each housing 10-20 people. The hallways, living rooms, dining rooms, and kitchens in each unit are usually shared spaces where residents can enter or leave as they wish. Each nursing home is made up of several units with staff moving between units. Frydendal is made up of six units and has approximately 60 residents in total. The fieldwork primarily took place in two units, but I visited all units during the fieldwork.

In addition to participant observation and informal conversations with residents, staff, and relatives during participant observations, four semi-structured interviews and one unstructured interview were

conducted. These interviews were audio-recorded and transcribed by me. One interview was conducted with a person with dementia, one with a staff member from the nursing home, one phone interview with a staff member from another nursing home, and two group interviews with a person with dementia and one of their relatives, with a primary focus on the relative. I translated the excerpts from fieldnotes and interviews in this article from Danish to English using an interpretative-communicative translation method, which aims to translate the sense, context, and effect of the text in opposition to literal translation methods, which translate word for word (Molina and Hurtado Albir 2002).

My positioning in the nursing home was influenced by my age (relatively young in comparison to residents, but close in age to many staff members), along with my previous experiences doing fieldwork in Danish nursing homes and the fact that I grew up in Denmark, making me familiar with the cultural context. Nursing home staff wore a uniform consisting of loosely fitting cotton pants and shirts with a badge that included their name and role in the nursing home. I did not wear a staff uniform but had a name tag with the name of the nursing home as well as my name (but not role) and I had a chip in my key chain enabling me to freely enter and leave most parts of the nursing home. Often, I was mistaken for a staff member. In these cases, I always described my research project and my role as a researcher and asked for oral consent during informal conversations to ensure clarity around my role. Since many people with advanced dementia were living in the nursing home and there was a constant flow of temporary staff, my position was not always clear to everyone in the nursing home, and I would often repeat this. Unlike staff members, I ‘hung out’ in the nursing home and had plenty of time to speak to and spend time with the residents without having other urgent tasks. Typically, I was seated in the dining room with a couple of residents and one of the pet robots close by.

Due to the COVID-19 pandemic, there were periods of absence from the field, which impacted my time spent with residents at Frydendal. The pandemic, as well as a nurse strike shortly before the fieldwork began, meant that the staff shortages experienced in Danish nursing homes (Kirkebæk-Johansson 2021) were amplified during my research. Further, social activities in the nursing home were limited due to staff shortages as well as the risk of infection. These circumstances made the time of the fieldwork unique while also providing a lens into the future of nursing home care, where a rising number of older adults and fewer staff is expected (Øvlisen, Golczyk, and Andersen 2022).

Consent and ethics approval

Written informed consent was obtained from staff, relatives and residents (by proxy or signed by themselves depending on their abilities and legal status). In addition to written consent, ongoing oral informed consent (including attention to body language and nonverbal signs of distress) (Novek and Wilkinson 2019) was obtained almost every day throughout the fieldwork. To protect the interlocutors, all names of people and places are pseudonyms. Ethical approval for this study was obtained from the Ethics Committee at the University of Witten/Herdecke (ID for ethical approval: 131/2020).

Pet Robots in the Nursing Home Frydendal

When you arrive at Frydendal, the first thing you notice is the modern interior, the light blue walls and the calm lighting, which adjusts automatically, following the daylight rhythms. To enter the units, you have to open two door handles simultaneously or take an elevator, which opens directly onto the ward. Located in a larger Danish municipality, the nursing home specializes in dementia care. All residents had a diagnosis of dementia, and many of them previously lived in other nursing homes but were transferred to Frydendal, as the nonspecialized integrated nursing homes could not meet their needs.

Pet robots have been used at Frydendal since 2007 when the home acquired two seal robots called Paro (See Figure 1). Paro is designed to look like a baby seal and makes noises and movements in reaction to touch and sounds. Yet, when I began research at Frydendal, neither Paro were being used anymore. One had gone in a washing machine and did not work afterward, and the other had been locked away in an office and did not turn on when we tried. This is a common destiny for Paro: although more than 400 Danish nursing homes bought these robots in the late 2000s, most of them are reported as “collecting dust” (my translation) and not being used (Janerka 2018). Paro is still being sold to Danish nursing homes via Danish distributors including the Danish Technological Institute, who report Paro as one of the most successful social robots in the world as well as the only social robot which has been certified as a medical device (Teknologisk Institut 2023). In Frydendal, a staff member described how she had previously used Paro with residents who enjoyed the seal robot, but these residents had all passed away, after which she had not tried using the robot again.



Figure 1: The Paro seal robot. Photo by Simone A. Felding.

In 2021, Frydendal received robotic cats and dogs called Joy for All (See Figure 2) (Ageless Innovation 2018) as well as other welfare technologies from the municipality. Since the seal robot at the nursing home did not work when fieldwork began, research mainly focused on the Joy for All cats and dogs. These robots are low-cost and relatively simple technologies compared to the more expensive and technologically advanced Paro. In 2023 a Danish distributor sold Paro for 48,500 DKK (approximately \$7,070 USD) and the Joy for All dog for 2,475 DKK (approximately \$360 USD) (Gloria Mundi Care 2023). The cat and dog robots have sensors activated by touch and light and are able to bark, imitate a heartbeat, purr and meow through nonvisible speakers. They can make some simple movements of the head, upper body, tail and paws but are not mobile (Koh, Ang, and Casey 2021). The robots have three different settings: on, off, and mute.



Figure 2: *The Joy for All robotic dog (left) and cat (right). Photos by Simone A. Felding.*

When I entered the nursing home, I expected to find the pet robots in the nursing home interacting with residents and staff in ways that I could observe and participate in as part of my ethnographic fieldwork. What I found instead was unexpected: I simply could not find the pet robots anywhere. It took experienced staff members from across units to help me find the pet robots in residents' apartment closets, in a storage room in the attic, and in a locked office. Slowly, my plans changed, and after 11 days of fieldwork spread over 7 weeks looking at how the robots were not a part of everyday life in the nursing home, I started working with the pet robots myself. This decision was made in collaboration with a dementia expert in the nursing home, who was my primary contact during the fieldwork. The decision was also discussed with fellow anthropologists from the Department of Anthropology at the University of Copenhagen, where I was a guest researcher during the fieldwork. The dementia expert as well as other members of staff followed my search for the robots in the beginning of the fieldwork, encouraged me to look for them in different places and for me to start using them in collaboration with staff. The nursing home staff seemed genuinely curious to see how the robots would work in the nursing home and since I had the privilege of time that they did not, they were interested in hearing about my experiences with the robots.

Using the robots myself had consequences for my positioning in the nursing home, especially in relation to staff, who sometimes thought that I brought in the robots or came from the companies producing or selling them. This was an ethical challenge during the fieldwork, which necessitated continuous explanations of the research goals and research questions but led to interesting discussions with staff about the pet robots. I walked around with either the robotic dog or cat on my arm and spoke to people. Because of this, I was given nicknames, such as *the cat lady* or *the woman with the dog*. My presence became connected with and inseparable from the pet robots. In the following paragraphs, we will show how pet robots are fluid beings and how this fluidity enables *the woman with the dog* to become an assembled temporary figure or duo in the nursing home.

Pet Robots as Fluid Beings

I am standing in the kitchen with the dog on my arm. The kitchen is across from the dining room, and no walls separate the two rooms. The dog is powered on and is therefore making noises and movements. It barks, turns its head and you can hear and feel something that resembles a heartbeat. In the dining room, two residents sit across from each other at a small table: Petra and Annette. Petra spots the dog, although it is far away from her. She smiles at it and begins to laugh out loud when the dog makes noises. I bring the dog to her and Annette. They seem to find it cute and laugh as I bring it to them. They sit and chat a little with big smiles on their faces. They caress the dog and react to the dog by smiling and laughing when the dog barks. The interaction looks very harmonious. At one point, Annette asks Petra if she thinks you have to change the batteries in the dog. The look on Petra's face changes. She doesn't reply but looks very unsatisfied to me. I get the feeling that the joy Petra got from the dog disappears for a moment. It feels like the sustainment of the dog as a creature breaks down – interestingly enough, I am disappointed by this. (Fieldnote; November 22, 2021)

There is something ambiguous and fluid about the pet robots which appeared throughout my collected data, including this fieldnote. This fluidity applies to the robots themselves, to their role in the care provided in the nursing home, in the relations between the robots, residents and me, and in the playful interactions with the pet robots. Part of this is connected to the design of the robots. They are designed to look like real animals and are in some ways designed to provide the kind of care and interaction that animals can provide, but at the same time, they are robotic. They inhabit an ambiguous space between animals, inanimate objects, and technologies. In the fieldnote above, it appears that both Petra and Annette enjoy interacting with the robotic dog. Though I had brought the dog into the kitchen to see if anyone was interested in the dog, I decided not to disturb them as they seemed to be enjoying each other's company. Nevertheless, the actions of the dog started the interaction, as Petra and Annette reacted to the dog's barking. Although the interaction with the dog appeared positive for both residents, their understandings of the robot seemed to be different and clashing. This fits with the signatures of the two residents: Annette is always verbally questioning the things around her, while Petra silently interacts with the pet robots and communicates clearly, though nonverbally. In this interaction, the robot had multiple roles: it was an object – I repeatedly referred to it in my fieldnotes as "it" or "the dog" – a machine that needed batteries, yet it was also the instigator of the interaction, a creature that brought joy. At first, these versions of the dog coexisted imperceptibly, but when they became distinct, it led to a breakdown of Petra's view of the dog and a situation that I was not sure how to deal with. A relative of Annette then came by and took her out, and the situation resolved itself.

The pet robots remained fluid throughout the fieldwork, and it is a phenomenon that kept occurring in the fieldnotes. The versions of the robots did not only differ from person to person but also changed from day to day or even moment to moment for residents. Often their being changed throughout conversations and interactions with residents. The abilities and characteristics of the pet robots also changed. Sometimes they were able to see, hear, run, feel, and speak, and other times they were described as emotionless and lifeless. This was challenging, as I tried to adapt to the current ontology of the robot during my interactions. Sometimes I felt that I succeeded in this, when I managed to match my actions and reactions to the current version of the robot. Other times it felt like I failed, for example, when I stated that the robot did not have a name to a resident who perceived the robot as my pet and got angry with me for claiming that my pet did not have a name. Here, my participation in the fragile

storytelling (Glavind and Mogensen 2022) of people with dementia was sometimes challenging and, though I remained attentive to the current ontology of the robot, the storytelling did not always succeed.

The *Cat Lady* or the *Woman with the Dog*

Per and I are sitting at a small table in the dining room. I give him a big smile. “You look sweet,” he says to me. “Thanks,” I respond. “We’re doing alright,” he says. “Is there food on the way?” The food arrives shortly after. He continues like this in an infinite loop: “We’re doing alright”; “Aren’t we doing alright?”; “That’s alright”; “That’s nice.” He says very positive things. Whichever staff member is nearby or passing by answers him: “Yes, Per”; “That’s alright, Per”; “Nice Per.” The cat is sitting on the table between Per and me. I turn the cat, so it is facing him. The cat is switched on and meows from time to time. Per looks at me with his eyes wide open, every time this happens. It seems that he believes that I am the one meowing. “That’s kind of funny,” Per says. “What are you saying?” he responds to the meows while looking at me. At one point, it seems to be too much for him. “Aren’t you capable of saying anything else?” he asks me. “One gets tired of listening to that,” he tells me angrily. I mute the cat. We sit like this for a while. (Fieldnote; October 28, 2021)

Other researchers have discussed the changing meanings of pet robots in nursing homes. Anthropologist Cathrine Hasse (2013) uses the pet robot Paro and its application in Danish nursing homes as an example of ‘multistable technologies,’ a concept that comes from philosopher Don Ihde (2012). Ihde argues that technologies stand in relation to humans and can therefore become different things and attain different uses and meanings when they become embedded in life-worlds, making them multistable (Ihde 2012). Hasse argues that this does not just change the technologies but also the people interacting with these technologies and that Paro transforms the professional activities and identities of nursing home staff (Hasse 2013). As the fieldnote with Per shows, the cat robot and I sometimes merged into one being. Here, it is not only the robot that is fluid, but in some ways also the embodiment of the facilitator that cannot be separated from the cat. Reflecting on my methodology, where I walk around the nursing home with the pet robots on my arm, including the interactions that have taken place in the nursing home, we conclude that the robotic cats and dogs cannot be divided from their facilitator – in this case myself. It seems, the nicknames *the cat lady* or *the woman with the dog* should potentially be taken much more seriously than they appear at first glance. As I walked around with the pet robots in the nursing home, I became an inseparable part of the pet robot use in the nursing home, and the robots became an inseparable part of my positioning, relations, and interactions during my time there. *The cat lady* or *the woman with the dog* becomes a methodological point of departure, where I would integrate the pet robots in my interactions with residents during participant observation, as well as an analytical point of departure for the ethnographic fieldwork and data.

Tinkering with Ambiguous Pet Robots

I sit down next to Hanne in the dining room. I have the cat with me and put it on the table in front of her. She asks me what it is. I explain that it is a mechanical cat and ask her if she wants to sit with it for a little while. She says that she cannot do that. She is allergic to cats, so unfortunately, it is not possible. I take the cat in my lap. I tell her that I am also allergic to cats, but that it’s different with this one. This cat is mechanical. “It is not a real cat, is it?” Hanne asks me. I tell her that it isn’t. I explain to her that it has batteries and everything. She laughs loudly. “Don’t try to fool me!” I laugh with her. “No, no,” I say. “You are no one’s fool.” We laugh. I ask her if she wants to try it since it is not allergenic. I tell her again that I also have cat allergies, but not toward this cat. She would like to try it. I give her the

cat. “Ahhh,” she yells. “It itches, it itches,” she yells loudly. I quickly remove the cat from her and put it back on the table. (Fieldnote; October 25, 2021)

The interaction between Hanne, the robotic cat, and me, is one example of the ambiguity and fluidity of the robot. Hanne’s interaction with the robot and me shows how the robot is not experienced as either a living animal or a technology but can be both at once: she was aware that it was not a real cat but still experienced it as a cat that triggered her allergies. The fieldnote also highlights how the person facilitating interactions with the pet robots has to be constantly aware of how residents perceive them in any given moment and act accordingly. Being a part of the fragile storytelling of Hanne and keeping the conversation and interaction going involves taking some chances. For example, I did not want Hanne to think that I was fooling her by saying that what I had in my arm was a real cat, but I also did not want to give her the cat when she experienced it as a real cat. In this situation, I thought it had become clear that it was not a real cat and therefore could not harm her, and I was surprised by her reaction to the cat, once she had it in her lap.

To understand what the robots and their facilitator become in the nursing home and what is needed when interacting with the pet robots, we have to understand the care practices in the nursing home. Care is an integral part of everyday life in a nursing home for people with dementia. Care can be understood as ever-changing, adjustable, creative practices (Mol, Moser, and Pols 2010, 119-140) as well as relational and intersubjective (Mol, Moser, and Pols 2010, 277-300). Ethnographer and philosopher Annemarie Mol, sociologist Ingunn Moser and social philosopher and psychologist Jeanette Pols (2010) use the concept ‘tinkering’ to describe care as a creative experimenting that is attentive to the needs and opportunities in the surroundings: a practice where you try out, fail, adjust, and try again (Mol, Moser, and Pols 2010, 7-25). “Tinkering as a concept helps think about the collective arrangements set up in dealing with dementia, because it encapsulates both how arrangements are repaired and how these repairs are provisional” (Mol, Moser, and Pols 2010, 134).

This understanding of care and the concept of tinkering helps us understand the care enacted by *the woman with the dog*. In the described situation with Hanne, the robot cat and I tried to care for her but failed, which led to new trials, adjustments, and repairs. I assumed that Hanne experienced the cat as not being alive and therefore not a trigger of her allergies. In retrospect, it remains unclear to me if the cat had gone back to being ‘a real cat’ or if this other kind of being that it had become could provoke allergies. The fluidity of the robots means that you can never assume what works, as it is constantly changing and evolving. You have to tinker with and experiment to create caring situations.

Fragile Infrastructures in Need of Care

As described by Mol, Moser, and Pols (2010), care is a complex phenomenon in practice. Care is not provided in a vacuum, but within relations and environments, and for technologies to be able to provide care, they also have to become part of these complex practices. Science and technology studies argue that technologies work through comprehensive maintenance and repair work (Schwennesen 2019; Denis and Pontille 2019). Sociologists Jérôme Denis and David Pontille (2019) argue that technologies as things are rarely definitive or finished but can rather be understood as fragile infrastructures that involve both human and technological work and are in constant danger of breaking down if they are not adapted and maintained.

In many ways, pet robots also need to be tinkered with to work. This was apparent in the nursing home, where the pet robots were not in use when I arrived, as they were not being cared for by the staff. There are many potential reasons for why the robots were not in use. When I talked to staff, they were mostly

positive and curious about the pet robots and willing to use them. At the same time, staff shortage meant that activities that were not seen as necessary in the here and now were rarely carried out. When I left the nursing home after a day of fieldwork, I always asked staff what I should do with the pet robots. Should I leave them in the common areas or with residents, or should I lock them in the office? Most of the time, staff replied that I should move the pet robots into the locked office. The logic behind this decision seemed to be that staff feared that something may happen to the robots if left out with the residents. This logic may be related to the fact that their previous experience with pet robots in the nursing home was with the expensive robot Paro, which broke because it had been washed in a washing machine after a resident spilled a cup of cocoa on it. After this incident, Paro was locked away in an office after use. When the robots were locked away between interactions, they seemed to be forgotten and did not become part of everyday life in the nursing home.

In the beginning of my fieldwork, the robots needed a great deal of human and technological work, as Denis and Pontille (2019) call it. Maintenance and repair work were not just about the practicalities I encountered at the beginning of the fieldwork (finding the robots and changing the batteries). Rather, maintenance and repair work continued throughout the interactions with the pet robots, where I remained aware of how they were perceived, how residents addressed them and interacted with them, and how I could adapt my behavior to the current version of the robots. This did not always work, however, as when the understandings of the dog as a creature broke down between Petra and Annette or when Hanne started yelling as she received the cat. In the situation with Petra and Annette, I wrote down my own emotional reaction, my disappointment in the fieldnote. I cared for the pet robots to ensure that they became part of the care practices in the nursing home, but I also cared for them to an extent, where I later noted in my fieldnotes how I worried what would happen to them after I left the nursing home. In some ways, the pet robots became important to me personally; we were not only the fluid being *the woman with the dog* but the pet robots and I also became emotionally attached in the nursing home through these practices of care.

Weird Robot Relations

The caring relationship between the pet robots and me inherent in *the woman with the dog* is made clear through a conversation between the resident Annette and me:

Annette: I think it [the robot dog] is very sweet. And you almost cannot resist it. But people don't really give it space, I could imagine. It is too quick to reject, too easy to reject it. But, I mean, I do like it. I think it is cute, and I have, or I know some people who have a tall doll, that is always smiling, right. But it cannot do anything in comparison to doggie there. And every time you see doggie, you think to yourself, how incredible it is, right? I mean, the imitation. That is well done. Or well imitated. Or, I don't know what to call it. No, it is cute.

Me: I have also become fond of it, since I walk around with it so much.

Annette: Yes. Yes, I could imagine that. You, you become fond of it. Also, because I am a little curious about that robot thing, a robot dog. What is expected there? Because it is so lifelike. You have to say that too, right. But it is weird, weird, that you have cast your love on it."

(Interview; December 16, 2021)

As Annette describes so clearly, the robotic dog is sweet, cute, and imitating a real puppy quite well. However, it is also ambivalent and weird. Even when speaking Danish, Annette uses the English word 'weird' to describe the robot and me. It is not just the robotic dog that is weird, but also my relationship

with the dog and how the pet robots and I became one weirdly assembled temporary figure or duo in the nursing home.

Philosopher and ecologist Timothy Morton (2016) uses the concept of weirdness to understand embodiments and what things are, which relates to our interest in understanding what the pet robots are and what they become together with their facilitator. Morton describes how “‘Weird’ comes from the old Norse root *urth*, which means ‘twist’ or ‘turn’” (2016, 20). He argues that bodies and things are weird, as they are neither reducible to their relations nor constantly present. At the same time, we cannot deny that things do exist in this world. Instead of seeing embodiments as constant and present, he argues that they are shimmering or flickering. He argues that existing is a twisted loop like a Möbius strip,¹ where it is impossible to locate the exact point of the twist as all of it is already twisted (Morton 2016, 19-20). This results in profound ambiguity, something that keeps recurring in my data on the pet robots and our attempts to grasp and pin down what this phenomenon is. The pet robots are not just fluid but also ambiguous. They do not just move from one being to another, but keep changing back and forth unpredictably, acquiring new abilities and becoming new versions of themselves. Just as the twist is impossible to locate in a Möbius strip, it is impossible to pin down the existence of the pet robot and what the robot is. It is weird and difficult to grasp the fluidity of and the current embodiment of the robot at any given moment.

Ontological Flexibility and Ontological Fluidity

Towards the end of my fieldwork, two staff members asked me how the pet robots were working, and I told them that my experience with the robots was that they did not work without facilitation, to which they were visibly disappointed and responded:

This is a huge challenge. That there are not enough people and that this will only get worse in the future. The pool of employees is too small and the pool of people needing help is only getting bigger. So, it is too bad that it doesn't work without employees. That was kind of the whole point. (Fieldnote; January 15, 2022)

This staff issue has an impact on how the pet robots can become embedded in everyday routines in nursing homes, especially when social robots are presented as a solution to staff shortages and not as something which has to be taken care of by staff. Based on an ethnographic study in a French nursing home, philosopher and sociologist Martin Chevallier (2023) talks about the invisible work staff have to do to enable residents' interactions with Paro. In line with this, anthropologist James Wright (2023) argues that social robots do not replace care workers but rather reconfigure care and lead to new tasks that nursing home staff have to perform.

Chevallier uses the term ‘ontological flexibility’ to analyze how staff work with Paro, and its undetermined design, and notes that Paro is never described as a seal in the nursing home but rather referred to as a different animal or a human baby (Chevallier 2023). In our paper, the main focus has not been on nursing home staff but on pet robots and residents. Philosopher Rasmus Dyring and anthropologist Lone Grøn (2022) similarly focus on the interactions of a resident with dementia with a stuffed toy cat. They argue that this creature, which the resident calls “the little one,” is an ontologically ambiguous creature, neither unambiguously human nor feline (Dyring and Grøn 2022). We argue that the need for ontological flexibility, which Chevallier discusses, stems from the fluidity and weirdness of the robots and their embodiments and relations. The robots are multistable technologies, as Ihde calls it, but they are also more than that. As we have shown, they are weird and ambiguous. We cannot pin down their existence or abilities, and they constantly flicker and move between being live animals, toys

and mechanical beings. Unlike the ontological ambiguity of “the little one,” which Dyring and Grøn discuss, this did not just apply to the robots but also rubbed off on me as the facilitator of the robots. Suddenly, I was able to meow (in the situation with Per), I was the owner of the dog, I defined the name and needs of the dog, and the dog steered my actions and relations to the residents. We call this the ‘ontological fluidity’ of *the woman with the dog*. We can never assume what *the woman with the dog* is in the moment but have to be constantly aware and open-minded to their changing embodiments and relations.

The fluidity of the pet robots and *the woman with the dog* is related to the design of the robots. Pet robots are designed to interact, trigger emotions, act like real animals, and provide some sort of companionship for people with dementia. Going back to our initial definition, they should be able to communicate with humans in an acceptable manner – something that makes them appear to be more than just mechanical animals.

Conclusion

In her book *Staying with the Trouble: Making Kin in the Chthulucene*, multispecies feminist theorist Donna Haraway (2016) argues that it is important to stay in the present and the thick of things and not only in relation to an imagined future. In many ways, her call to stay with the trouble and avoid oversimplifications and binaries resonates with our findings on pet robots in Danish nursing homes. The questions I received, when explaining this research in the field, were centered around themes such as effectiveness and taking over the work of humans. Staff, management, and relatives want to know if the robots ‘work’ and want a simple answer to whether or not nursing homes and decision makers should invest in this technology. Social robots are often described as representations of dystopian or utopian futures, depending on people’s view of welfare technologies as something that either saves or destroys a welfare state under pressure by replacing humans and robbing vulnerable people of the human care they need. Haraway describes a kind of futurism that imagines that things matter only if they work (Haraway 2016). In many ways, the pet robots do not work as intended by the municipality, but that does not mean that they do not matter in the nursing home. As Haraway calls for, we have to remove ourselves from a binary view of the robots as either solutions or problems – just as we cannot understand the robots from a binary view as being either mechanical or alive.

In the fieldwork, the robots are characterized by their ontological fluidity; they are fluid and change constantly, coming into being together with their facilitator. They are one of many actors in the nursing home, working and coming into being with staff, residents, and me. The ambiguity of the pet robots might easily be ascribed to the residents’ dementia. However, if we consider that the design of Paro demands ontological flexibility from staff (Chevallier 2023), understand embodiments as shimmering and flickering rather than constant and present (Morton 2016), and understand technologies as multistable (Ihde 2012), pet robots are inherently ambiguous. This cannot simply be ascribed to various symptoms of dementia diseases. We have to stay with the trouble and complexity of dementia care and pet robots as fragile infrastructures in need of care that cannot be understood or studied alone.

As presented in the introduction, there is a vision of welfare technologies in Danish welfare policies as something that can help provide sustainable care in the future. In many ways, these technologies are seen as what sociologist Paul Higgs and psychologist Chris Gilleard (2021) call ‘techno-fixes’: “The roboticisation of care might better be directed not at replacing but at helping human carers achieve their aspirations to deliver a kinder and more compassionate care. As with many ‘techno-fixes’, the problem lies less in the technology itself than in the worldview it embodies” (Higgs and Gilleard 2021, 2). When we look at how the pet robots came to the nursing home, it was the municipality that originally decided

on purchasing and implementing them. In many ways, I also became a part of this strategy, as I chose to work with these robots. Our findings show that the pet robots are not the techno-fixes wished for, providing a solution to the challenges of elder care, but rather became an extension of their facilitator in the field. *The woman with the dog* can develop caring relations with the residents, but this is not something that appeared from the pet robots alone. This does not mean that an ethnographer has to be present for the robots to interact with residents; it can be a staff member, family member or any other possible facilitator. We have shown how the robots need care, tinkering, and maintenance and repair work to become embedded in the nursing home, something which can be a challenge for understaffed nursing homes. Staff cannot assume what works with the pet robots but must remain attentive in interactions with residents and care for the robots. They have to react flexibly to the ontological fluidity of the pet robots and have to tinker with them – something that they already have experience with working in dementia care. Based on our findings, we argue that predefining how to work with pet robots, what to call them, or when to use them underestimates what is at stake in these interactions and overestimates the agency of the facilitator. *The woman with the dog* comes into being together, and this weirdly assembled temporary figure or duo constantly flickers, moves, and coexists in different versions. Staff cannot control this but can remain aware, attentive, and flexible in their work with residents and pet robots.

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Notes

1. "The Möbius strip, obtained by taking a rectangular strip of plastic or paper, twisting one end through 180°, and then joining the ends, is the canonical example of a one-sided surface" (Starostin and van der Heijden 2007, 563).

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