What makes people accept or reject companion robots?

A research agenda

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ABSTRACT

Social companion robots are intentionally developed and designed to support humans in useful tasks and to use social cues to establish a relationship to the user. However, so far no social companion robots existed outside of research labs to perform long-term studies "in the wild", exploring how this relationship actually evolves over time. In this paper we present the research agenda for such a study using the soon commercially available BUDDY robot from Blue Frog Robotics. We chose a sociological ethnographic approach with eight households, methodologically mainly focusing on qualitative data gathered through a series of household visits. For data analysis we aim at extending the Domestic Robot Ecology (DRE), which was originally developed based on ethnographic studies with vacuum cleaning robots, and for data interpretation we base our work on a newly proposed sociological framework, we call everyday-life centered approach (ELCA).

CCS CONCEPTS

•Human-centered computing~Field studies •Human-centered computing~HCI theory, concepts and models •Human-centered computing~Empirical studies in HCI

KEYWORDS

Long-term human-robot interaction, field trial, technology acceptance.

1 INTRODUCTION

Nowadays the first vacuum cleaning and lawn mowing robots have already entered people's homes and daily lives. Finally, the first companies, such as Blue Frog Robotics (see Fig.1) and Jibo (see Fig. 2) claim to have produced the first social companion robots for the consumer market. Social companion robots are intended to serve two main aspects: (i) supporting the human in useful tasks and (ii) using social cues to establish a perceived social relation to its user [10].

Figure 1: BUDDY robot; Blue Frog Robotics [1]

Figure 2: Jibo robot [2]

One overarching goal of robot developers and researchers is widespread acceptance of robots within society. Involving end-users in the early stages of development helps researchers to understand what makes people accept or reject technology and enables developers to integrate this knowledge in their design. However, it is not explored yet how social companion robots are actually perceived and treated by end users over a longer period of

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time. Up till now long-term studies of ordinary people sharing their space with robotic products in their homes are still rare and mainly performed with autonomous vacuum cleaners (e.g. [15] and [41]) or entertainment robots with limited functionality (e.g. [11], and [4]). To date research robots are still not robust enough to be studied outside the lab for extended periods without the supervision of an expert.

Only a minority of studies in the interdisciplinary research field of Human-Robot Interaction (HRI) has paid attention to what happens with the user behaviour toward robots after initial exposures. The few existing longitudinal HRI studies often report that their robot system on the long-term failed to engage their users (e.g. [14], [15], [12]). Therefore, this project proposes to investigate the changing dynamics of HRI in domestic environments with the social companion robot BUDDY developed by Blue Frog Robotics (France). A series of long-term sociological ethnographic studies in Vienna, Austria, is planned with eight demographically diverse households each provided with a BUDDY robot. What happens after initial exposure is exactly the phase where people decide between continuing and discontinuing the use of new technology. The main motivation is to understand long-term usage and acceptance to identify and understand the factors that can promote and hinder the integration of this type of social companion robot in different types of households. People's usage, relation to, and perception of the robot over time will be explored.

In this position paper we present the research agenda for our field study that will start in January 2019. After an overview on related work, we present our newly proposed everyday-life centered approach (ELCA) and outline the planned methodology. The paper closes with some final thoughts on the relevance of the proposed research agenda.

2 Related Work

In general, the temporal dimension of acceptance is under-studied in HRI, however, a first empirical framework consisting of six phases of robot acceptance will serve as guidance for the proposed research which acceptance factors to observe [12]. The most important related adoption model for the proposed research is the Domestic Robot Ecology (DRE) by Sung et al. [42] which was later extended by the findings of Fink [15]. DRE is an initial framework of domestic robot adoption and it applies a holistic view to the relationships that robots shape in the home and takes into account long-term effects.

Social engagement is an aspect of interaction that becomes more and more prominent in the research area of companion robots. A definition of long-term engagement is proposed by Bickmore et al.: "the degree of involvement a user chooses to have with a system over time" [5]. Different possibilities to foster engagement (both short- and long-term engagement) especially with companion robots have already been studied, mostly with the goal to create sophisticated emotional models, which cause complex robot behaviour. Research has shown how simple cues can foster engagement (e.g. [5] and [39]). Through a series of longitudinal studies Bickmore et al. [5] could show that relatively simple cues can make an interface agent more life-like and engaging. For example variations in the agent's behaviour made it seem more engaging and increased participants' willingness to continue interacting with it. Similarly, Short et al. [39] showed that behavior variation can lead to a perception of higher engagement. Moreover, the studies by Leite [28], on the long-term engagement of children with a chess-playing robot, revealed that children found a robot more engaging if it demonstrated adaptation and empathy.

However, studying social engagement in domestic settings poses many challenges to the researcher and the setup of the study due to privacy issues and the lack of control of external variables. There is a gap between the researcher's wish to measure as many things as possible and being constrained by the private nature of the home, as well as the time the researcher can effectively spend in the home to do observations and collect data. Sung et al. [41] reported on the methods and techniques that they used during their six-months field study on roomba robots used in 30 households. This study, and the follow-up research performed by Fink [15] in Switzerland, can be taken as good examples of how to set up and carry out a long-term HRI study in a domestic environment. Other relevant long-term household studies were done by Forlizzi & Disalvo [17], Forlizzi [16], Fernaeus et al. [14] and de Graaf et al. [10]. The first two studies used the roomba robot between three weeks and six months to understand its usage, adoption patterns, and social impact. The last two studies used the Pleo and Karotz robot and explored the discrepancy between expectations and long-term adoption of the robot (i.e. the novelty effect). Sample sizes varied between six and 30 households.

The field studies conducted so far in people's homes indicate that domestic robots can create some unique dynamics within the "home ecology" by affecting routines, people, other product use, and the physical space. For instance, in contrast to a manual vacuum cleaner, the robot encouraged people to make adjustments to their home and to engage in pre-cleaning up activities [17].

3 Everyday-Life-Centered Approach

An approach to design that has already entered the HRI research community more than 10 years ago is user-centered design (UCD). The major focus of UCD lies in the user centricity of the technology development process; the design of the system adapts to the needs and wants of the potential user group so the system gets optimized in a way that the user does not need to change his or her habits when utilizing it. Hüttenrauch [23] e.g. have showed in his thesis how user-centered design can inform the design of a mobile services robot (fetch-and-carry robot) in an office environment. Therefore, he adapted user-centered design methodologies and approaches from HCI for HRI. Based on a longitudinal study, he investigated user roles and the spatial management when face-to-face interaction with the robot occurred. Similarly, the first results of a long-term HRI development project based on a user-centered design approach for a mobile service robot can be found in [27].

Discovering people's perceptions, expectations and impressions of social companion robots in their private domestic environments over a longer period of time is vital for informing the design and acceptance of these technologies. This paradigm of social or mutual shaping of technology has been debated for robotics similarly [36]. Research that investigates the long-term acceptance of socially interactive technology in domestic environments is necessary for a successful diffusion of these types of technology within society.

However, to actually understand the long-term integration of companion robots into domestic social structures, we claim that user-centricity is not sufficient and that studying these robots "in the wild" [35] is a relevant precondition, but in itself also not sufficient. A methodological strategy alone does not propose any theoretical suggestions for what to focus on when interpreting human-robot interaction and relations as they unfold in the everyday. Instead we propose a sociology-driven everyday-life-centered approach (ELCA) for the study of social companion robots in a domestic setting.

With the development of social companion robots as end consumer products, it is possible to observe a societal change where robots are no longer only put to work at the "backstage" of society, but are also placed as front figures in the uptake and integration of robotic systems in various social practices ranging between caretaking, teaching, and housekeeping. As argued elsewhere [21] although the idea of placing robots in the everyday life context of humans is the primary incentive for the development of these robots, any clear understanding of such turn of phrase is lacking and its meaning is taken for granted in both scientific and public debate concerning these robots.

From a sociological point of view, speaking of the everyday-life context of humans is not self-evident, but in fact rather problematic. With current dualistic understandings of the everyday, as either singular individual acts (i.e. the perspective on the particular) or as the common structure for a group of people (i.e. the perspective of the general), any attempt to demarcate the 'everyday' becomes a challenge, since it requires the inclusion of almost everything [22]. Therefore, without a systematic and thorough consideration of how it is possible to think about the everyday-life context as some kind of theoretical framework for the study of human-robot interaction, such turn of phrase will remain vaguely redundant. Taking on the task of analysing the subtle and nuanced encounters between humans and social companion robots through the consideration of the 'everyday' has unfortunately also been neglected in the sociological discussion concerning these robots. Mainly concerned with the social status of social companion robots compared to that of humans, sociological agency- and interaction-oriented approaches have focused on the modification of the criteria for when sociality can appropriately be applied to these robots. To preserve theoretical coherence, arguments of different levels or degree of agency or ascription of as-if-intentionality to robots have been proposed, thereby granting robots some sort of co-independent capacities for either action or communication (e.g. [33] and [29]). Grasping how various social concepts and theories undergo change with the introduction of these robots into the everyday-life context of humans is undoubtedly an important discussion, but such narrow focus also means that alternative approaches are left unexplored.

For the proposed research we suggest that the theme of everyday life can actually be used as a theoretical resource to guide empirically based studies of human-robot interaction. By drawing on the sociological literature discussing the theme of everyday life, it is possible to show at least three different dimensions of the 'everyday' that any study of human encounters with social companion robots should be sensitized to (see Fig. 3).

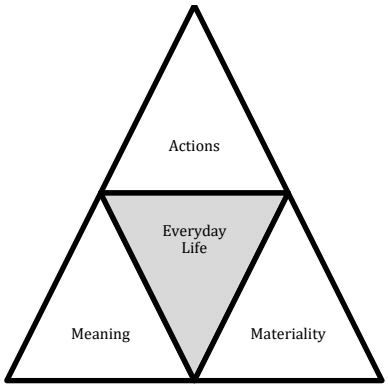

Fig. 3: Proposed everyday-life-centered approach (ELCA) for studying the social companion robot BUDDY in a domestic setting. .

The sociological thematization of everyday life arose from different, though intertwined, emphasis on the analysis of the interpretive process of everyday-life activities. Grounded mainly in the tradition of dramaturgy [19] and ethnomethodology [18], everyday life has been explored through the emphasis on the performative and practical sides of actions. With a common micro-sociological perspective on interaction this dimension stresses the importance of actions with regard to context, norms, and values for the establishment of everyday life.

Others have explored everyday life with a special focus on the subjective constitution of meaning, which line of thinking is known from the tradition of phenomenological sociology ([4] and [38]). This dimension points towards the important role interpretation of meaning through shared experiences plays for sense making in everyday communication or activities, and why knowledge sometimes appears as common sense.

With the success of actor-network theory ([25] and [26]) and practice theory ([31], [37], and [34]) materiality and engagements with various sorts of materials have recently been highlighted as indispensable, but often overlooked, aspects of everyday life. Attentive to local everyday practice and refusing the subjugation of materials (e.g. bodies, things, settings, technology and objects) to humans, this dimension foregrounds the ongoing reproduction of everyday life as a process of mutual shaping and enabling between materiality and human activity or intentions.

Reference to everyday life as a theoretical resource encompasses considerations of actions, meanings, and materiality in conjunction, taking this short overview as a starting point. We therefore take the everyday-life context of humans not only as a reference to the specific domain of application, but also as theoretical framework that can inform and tailor current human-robot interaction research by taking into account the dynamic and situated nature of our social reality. Any study of social companion robots in the everyday-life context of humans must therefore, according to ELCA ensure that the encounters between humans and robots are captured and recorded, as they play out in an unstructured situation and in real-time. In this sense, the ELCA links to the emerging methodological strategy that advocates studying robots "in the wild" [35]. The important difference is that the everyday-life-centered approach (ELCA) contains within its theoretical scope a blueprint for which aspects of the everyday are relevant for the empirical study on social companion robots in the everyday life context of humans.

Moreover, the benefit of switching from user-centered design (UCD) to the everyday-life-centered approach (ELCA), when studying social companion robots in different households, is that action-constitutive implicit or tacit knowledge [32] can be more extensively included in the study of human-robot interaction and relations. Because UCD relies upon an exact understanding of the users, the tasks and the environments only knowledge that can be transformed from the implicit to explicit will be considered relevant when mapping the abilities, needs and wants of people in the specific context. Because knowledge that constitutes the everyday commonly refers to particular habits and routines of actions or behavior, of which actors are most often not fully aware or have access to, much tacit and implicit knowledge remains latent in such context and is sometimes experienced as intuitions. By arguing that certain types of knowledge cannot in principle be grasped by descriptions or verbal statements, though still relevant for empirical work on human-robot interaction and relations, ELCA leaves space for a strong interpretation or thesis of implicit or tacit knowledge [44] in HRI research, which is yet to be done.

4 Research Agenda

A series of long-term sociological ethnographic studies in Vienna (Austria) is planned with eight demographically diverse households, each provided with a BUDDY robot. What happens after initial exposure is exactly the phase where people decide between continuing and discontinuing the use of new technology. Our main motivation is to understand long-term usage and acceptance to identify and understand factors that can promote and hinder the integration of this type of social companion robot in different types of households. People's usage, relation to, and perception of the robot over time will be explored.

The BUDDY robot is developed and advertised by Blue Frog Robotics as a robot that should become an integral family member over time by participating in daily household activities. According to the promotion materials and videos for the BUDDY robot, it is able to protect the home, offer assistance in the kitchen, entertain the family with music and videos, act as a calendar and alarm clock, and easily interface with popular smart home solutions. Moreover, the BUDDY robot can serve as personal assistant, reminding of important tasks and events. It is watching the house by patrolling while the owner is away and alerting when detecting something unusual. It offers educational games for children, answers phone calls, suggests recipes, and it enables communication with remote friends and relatives via video calls. Technically, the autonomy of the BUDDY robot is supported by a battery-life of 8-10 hours and is equipped with 1 camera, 1 micro-phone, and 1 speaker to provide human and object detection, recognition and tracking, and speech recognition along with text to speech conversion facilities. The robot has 3 wheels that, along with motion and range sensors, give it full navigation ability. Its open source software development kit and "plug & play"-accessible technology makes the robot modular to build upon and therefore adaptable to research purposes.

4.1 Research Questions & Hypotheses

Our proposed qualitative longitudinal study aims at answering the following general research questions:

RQ1 User's perception of BUDDY as social companion robot: How do people with different socio-demographic backgrounds perceive having the robot in their home? How does perception change over time and with growing experience with the robot?

RQ2 Acceptance and rejection factors: What are the factors that make people accept or reject the BUDDY robot (both short- and long-term) as a part of the household and everyday life?

RQ3 Adoption process: How does the adoption process of the BUDDY robot look like? Does it differ from other domestic robots such as vacuum cleaners and entertainment robots? How far can the Domestic Robot Ecology framework [42] be applied to the study findings?

RQ4 Social engagement: Do people actually engage in a social or human-like way with the BUDDY robot, i.e. do they treat it as a companion, and how does this engagement evolve over time and differ in terms of socio-demographic factors such as age, gender, and profession?

RQ5 Everyday-life centered approach (ELCA): To what extend does a focus on the various aspects of the everyday life context of humans add value to the interpretation of the data compared to the approach of user-centered design (UCD)?

According to findings from previous work, the following hypotheses will guide our work and analysis of the data toward relevant aspects:

The main working hypothesis of the proposed research is that the interaction with the robot BUDDY will change over time and that its adoption and acceptance will differ in terms of specific socio-demographic qualities of the involved households. Given that the hypothesis can be confirmed empirically, our study may provide valuable insight into the identification of obstacles for the acceptance of domestic robots in household setting and thereby help developers to better shape the design of future social companion robots.

HYP1 (User perception): Households with children and pets experience more fun interacting with the BUDDY robot and in turn interact more frequently with it. Single person households and households with elderly people experience a decreased feeling of loneliness and in turn miss the robot when it is away.

HYP2 (Acceptance): Perceived usefulness and ease of use will be prominent long-term acceptance factors, whereas sociability and animacy will be more of short-term relevance.

HYP3 (Adoption Process): The Domestic Robot Ecology [42] can be used as a basis to describe the process of adoption of the BUDDY robot, however there might by differences as the specific robot used in the proposed research is not an autonomous vacuum cleaner.

HYP4 (Everyday Life): By using the everyday-life centered approach (ELCA) for the interpretation of data it is possible to provide a systematic account of the complex and changing dynamics of long-term interaction or relations with the social companion robot BUDDY in the household setting since this theoretical framework stresses the situated nature of social reality.

4.2 Methodology

Ethnography, emerging first from anthropology and later adapted and modified by sociology, is a qualitative methodology used in the social sciences to study people cultures or groups of people. Using a traditional anthropological interpretation, undertaking ethnographic research means that data should be obtained via extensive fieldwork. Immersed in the field, the researcher would through participant observation, study the social interactions, behaviors and perceptions that occur within a primitive, exotic and unfamiliar culture or group of people by following and engaging in their everyday life over a long period of time ([6], [30], and [13]).

However, because the main goal in this proposed research is to study in detail eight households (a relatively small sample) over a seven month long period (by using frequent field visits), we will rely instead on an approach to ethnographic research that has been developed within a sociological tradition. When the so-called Chicago School of sociology started to apply anthropological techniques to the study of local contexts “closer to home”, the ideal of total submergence of the researcher into the studied culture or group of people was no longer a strict requirement for ethnographic research [20]. Similar studies have already been performed in HRI to study long-term adoption of robots in homes ([6]; [41]; [14]; [15]).

Potentially relevant events in long-term studies can occur not only at predefined time and space, but within the whole living space and at any time also when the researcher is not present. Using extensive on-site video recording, as a solution to this challenge, would create an unnatural setting and therefore not meeting the goal of the proposed study to explore natural interaction. Another challenge is to capture the changes in routines or habits caused by the introduction of the robot BUDDY and its “involvement” into the existing social dynamics. Routines and habits often flow without conscious thought; consequently, it is hard for participants to explicitly articulate or describe them and thus they are elements of the everyday that are difficult to investigate. These challenges will be addressed by using a similar study design and methodology as proposed by Sung et al. [41] and Fink et al. [15], which consists of several so-called household visits which consist of interviews combined with specific field tools and techniques. A baseline of existing household routines and habits will be established in a pre-visit before households receive a BUDDY robot and are regularly visited over a period of six months. However, in order to explore if users will miss the BUDDY robot (see HYP 1) the concept will be extended by not only exploring how the presence of the robot influences the household, but also how its absence after half a year affects people. The details on each visit are outlined in the following.

First visit: Approximately one week prior to handing out the BUDDY robot, an introductory visit and home tour will be done in order to get to know the household, their routines and habits, and their attitudes towards robots and technology in general.

Second visit: About one week after the first visit, we will bring the BUDDY robot with us. We will interview people about their expectations, then let them unpack the robot, and observe and document their initial reactions to it while they are setting it up and use it for the first time. Each household will get a diary to report the usage of the robot until the next visit.

Third visit: Approximately two weeks after the BUDDY robot was introduced to the household, the researcher will come back to see how the household experienced it and how it was used, by whom, when, how often, for how long, and where.

Fourth visit: About two months after the BUDDY robot was deployed, the households will be visited again to examine how the usage and their perception of the robot has changed over time and how far the robot is integrated into everyday life.

Fifth visit: A next visit will be conducted about six months after the BUDDY robot was brought to the household. This is again to investigate changes in the usage patterns, to assess social dynamics and whether the experience with the social companion robot has changed how people perceive robots in general.

The time intervals between the first five visits were chosen according to Fink [15]. During the first two weeks with the newly introduced robot, the households' experiences are likely to be impacted by the novelty of the new device. Normally, it is said that after about two months, these novelty effects tend to have worn off ([14] and [41]), but depending on how frequently people have used the device, they might still try out new strategies of usage. Finally, after almost half a year of living together with the robot, one can assume that people formed a stable opinion about the device and developed a stable usage pattern. However, it is also of interest what happens after these five months, therefore the study design is extended by two more visits after the BUDDY robot has been removed for one month.

Sixth visit: During this visit, it will be examined if people missed the robot BUDDY and how its absence influenced social dynamics. After this month of absence the households can keep the BUDDY robot again for one more month.

Seventh visit: This final visit is done to examine how the participants experienced the reintroduction of the BUDDY robot.

4.2.1 Data Collection Data will be collected at all the households throughout the seven-month period, regardless of whether the household actually uses the BUDDY robot or not. We plan to use several qualitative methods and tools to gather data. At each visit, semi-structured qualitative interviews will be conducted (each lasting 1-1.5 hours), audio-recorded, and qualitatively re-transcribed. All household members will be interviewed collectively and asked about how they used the robot, how it affected their social dynamics, their satisfaction with it, and the perceived benefits and constraints.

To make it easier for the participants to articulate and describe these and other aspects, the interviews will be enriched with various activities, such as the Day Reconstruction Method (a specific interview technique by Kahneman et al. [24]). Additionally, small drawing or tinkering activities [15] will also be used in order to involve children in the research process as well as making it more entertaining for adults to ensure a low drop-out rates. Fig. 4 gives examples from the work of Fink [15], which will be adapted for the purpose of the presented field trial.

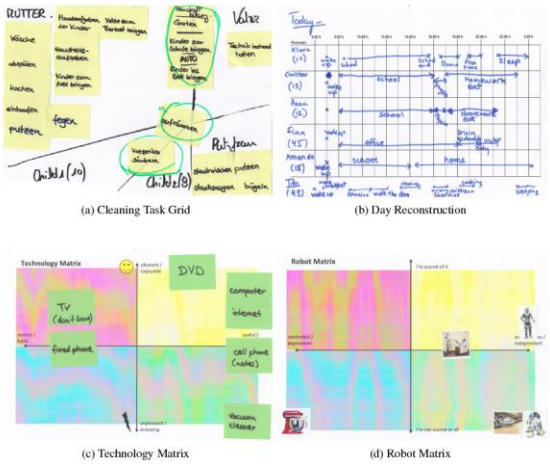

Fig. 4: Various tools used by Fink [15] to capture people's routine and their attitudes toward technology.

The interviews will also comprise short questionnaire/rating scales to quantify people's perception of the robot. Participants will be asked to rate the robot in terms of its intelligence, usefulness, perceived ease of use, its impact on the household, the experienced fun, and the emotional attachment, as well as their overall impression. The questionnaires will be adapted from Fink [15]. In cases where informed consent by the participants is given, also the automatically anonymized log files from the BUDDY robot will be used in order to understand when people used which functionalities of the robot. We intend to define logging criteria together with Blue Frog Robotics in order to collect the relevant logging information. Together with the interpretation of the self-reporting data, the logging information enables a precise evaluation of how and why participants used BUDDY.

For each participating household a detailed profile will be created and updated after each visit to allow for simultaneous analysis. The majority of the data (besides the questionnaire scales and the logging) will be analyzed through qualitative methods, where at least two researchers will explore the collected material with respect to the research topics. This process will be guided by Grounded Theory [6], a research method and approach to the systematic analysis of (qualitative) data. This data will then be analyzed according to DRE [42], the social acceptance framework [12], and interpreted by focusing on the three dimensions of ELCA. This analysis will make the findings comparable to the existing studies on the roomba robot and will provide insight into the adoption differences between a vacuum cleaning robot and a social companion robot. Finally, design implications will be derived and communicated to Blue Frog Robotics in order to inform the future design of the BUDDY robot.

4.2.2 Planned Sample Given that the sample for this long-term study is small (also due to the fact that only three robots will be available) a careful selection of the study sample is crucial. During

recruitment, we will try to balance out the households' demographic profiles seeking diversity. Balance in presence of children, income level, age range and technical knowledge should be achieved. Technical knowledge will be defined as having technological education, employment and/or hobbies. Participating households should 1) have at least one adult member (18-year-old and above) and 2) not have plans to move in the six months since prior research shows that the layout of the room can impact usage patterns. All participating households should be located in the greater area of Vienna, Austria. Amazon vouchers over 100€ in total for each household are planned as effort compensation for the participating households.

Tightly specifying the participant group will provide more reliability given the small group size. To increase homogeneity and convenience, most participants should live within 10 square kilometers of the Technical University of Vienna. As all participants will be able to use the robot for free it has to be considered in data interpretation that their motivation might differ from actual end-users who will have to buy the robot. The outcome of this research will be mainly detailed qualitative observations. Accordingly, results are hardly generalizable in a statistical sense. If the data allows it, mixed effects modeling analysis will be preferred to ANOVA for questionnaire and logging data analysis as it may better account for the influence of individuals within the households. Sung et al. [41] and Fink [43] suggested not to use log data, but only observations, interviews and other qualitative techniques, as log data could give participants the feeling that they are obliged to use BUDDY or lead them to think that the robot was manipulated in other ways, thereby enabling and making relations of trusts to the robot difficult.. However, as BUDDY provides a wider range of functionalities than vacuum cleaning, it was decided to have logging in order to gain additional insights to pure observation and interviews.

5 CONCLUSIONS

"Real" human-like social abilities, such as common sense, empathy, and reciprocity are far from being realized in current state-of-the-art of social companion robots. Nevertheless, these robots are often portrayed as "friends", "partners", and "members of the family" in HRI research and the public debate. As argued by Dautenhahn [8], due to the evolutionarily determined cognitive limits of humans, people may be constrained in how many "friends" they can make or have in their everyday life. Because humans need to put emotional, psychological and physiological efforts into establishing social relationships, it is not trivial to ask if they are willing to make a similar investment towards robots, which cannot reciprocate this investment. Considering the current stage of robotics we assert that users of a companion robot, such as the BUDDY robot, may enjoy interactions and relations with these robots in terms of role- and pretend play since they are only simulations, not the real experiences that humans share.

As Turkle et al. [43] pointed out, robots intentionally designed as "Relational Artifacts" encourage people to develop a relationship with them, which can lead to misunderstandings concerning the authenticity of the interaction or relations. There are many open questions, for instance when considering children and their relations to robots [9]: Will children develop separate friendship categories (e.g. "friendship with a robot", "friendship with pets" and "friendship with people")? Will they apply the same moral and ethical concerns to robots, animals and people? Will social companion robots constitute a new ontological category? At present, such questions cannot adequately be answered because this would require long-term studies into how people interact with robots, over years or decades. To make matters worse, such results are difficult to obtain and may even be ethically undesirable [9]. Field trials and user studies in general are always a snap shot of the current conditions. Hence, our work aims at informing designers of robots about the potential conceptual notions people have when engaging with social companion robots. These robots are now entering the end consumer market and are becoming more and more widespread, so we urgently need to start gathering data on the impact of interaction with these systems. The research proposed in this position statement is just a starting point, but to our conviction offers a stepping stone towards answering these complex and big questions.

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