Consequences of relationships with robots in our everyday lives

Izabela But
Faculty for Education
Kardeljeva ploščad 16
1000 Ljubljana
+386 51 664369
Izabelabut92@gmail.com

ABSTRACT
We live in an era where robotics and artificial intelligence are rapidly developing, resulting in first humanoid robots. A novelty like this could have a great impact on the society. It is therefore important to consider what potential positive and negative consequences the introduction of humanoid robots into society might pose. At first, this article briefly presents a pilot study on attitudes of the elderly towards robots in our everyday lives. We will also consider a similar research. We used both to present general attitudes towards robots. We will then continue with further investigation on how and why the robots influence humans – we will point out some of the human and the robot characteristics that are involved in their relationships and discuss why some consequences, regarding characteristics, are good or bad for human beings.

Keywords
artificial intelligence, robotics, robots, humanoid robots, ethical issues

1. INTRODUCTION
Every novelty in science, that will soon penetrate/infiltrate our everyday lives, should be carefully considered, because we must be prepared for the consequences – the good and the bad, and how they could possibly influence the society and individuals. In this article we will talk about robots that are entering our day-to-day lives in many different ways; from the industry, and the army to our homes. We will start with my pilot study and a similar research. They will serve as a starting point for further discussion, where we will identify relevant characteristics of humans and robots, and how those influence their relationship.

2. PILOT STUDY
The main aim of the study was to investigate what the elderly think about the usage of robots and how robots make them feel. Hypothesis is that the elderly are not as open, to novelties, such as robots in our everyday lives, as young people are. Coincidentally, participants in both groups differed in level of education and because of that there is another hypothesis; highly educated participants will be more open minded for novelties and will consider them more critically than the ones with lower education.

2.1 Participants
There were two groups of participants. Both consisting of four women. In the first group, the participants were 80 years old or more, and in the second group the age span was from 70 to 80 years old.

Because of a fortunate coincidence, participants in the first group were highly educated – they have all completed university-level education. Participants in second group have not. This information was used to form the second hypothesis, presented a few lines above.

2.2 Method
Before we started the interview, I asked all the participants about their usage of computers and cellphones. This information showed whether they were familiar with some forms of technology.

All participants in the first group had their own phones, but not a computer although they did use computers in the later years of their careers. They admitted that it made some work easier, but not all of it. For example, it was really helpful when you needed a calculator, but not useful in making compromises with clients or selling the products. Today they are using computers for writing e-mails and looking up information on the world-wide net. Only one of them is avoiding computers and prefers newspaper and books. On the bases of their education and the use of computers and phones I think they will be open but critical to new technology.

In the second group, there were four elderly ladies from a smaller town. They didn't have such high education as the participants in the first group. They were a cook, two maids in the local hotel and a cashier at the local market. They have lived in their home town for all their lives and they never travelled. During their careers, they were not in contact with computers. Today, they have their own cellphones, but not any computers. However, they all have TVs, for which they said are a good source of information for them. They said they don't have any need to learn how to use a computer or a smart phone. As we can see, the second group is quite different from the first one. My hypothesis is that they won't be as open for new technology, as the participants in the first group.

After this introduction we proceeded with the interview, based on some videos from the portal "Youtube" [1,2]. Questions were prepared beforehand. Questions were as following: "How do you feel about robots helping you in your work place? Would you trust them with your duties? Do you think we should welcome industry robots in our work places if the human workers won't lose their jobs because of it?", "Pepper is a social robot; you can talk to her, play cognitive games with her, she can make you feel less lonely. Would you accept this kind of robot in your home?", "If you'd live in a home for the elderly would you prefer a robot or a human helper and caregiver?", "We can use robots for human rehabilitation. Would you be open to trying it or would you prefer

a human physiotherapist?", "Do all these robots we have seen in videos make you feel good and safe, or are you having any doubts and why so? What do you like about these robots and what makes you feel uncomfortable? Do you think they would be more successful in social interactions because they would constantly be in a good mood and would be made to satisfy humans?"

2.3 Results

In the first part of the first video [1] we can see an industrial robot. General manager said that they thought the robots were good for their company because they didn't need rest and they represent a lower expense than a human yearly salary. Besides, human employees had accepted them, as well. In the first group, participants agreed that it made sense to employ robots in the industry, if it will be taken care of the human workers left without jobs. Through discussion we came to an idea of a universal salary for all people, but came to a problem that owners of such companies would not give up on "easy money" easily. And as consequence, the rich would become even richer and the poor even poorer. To a question, if they would have a robot helper at their work place, they answered differently. But what was common to all of the answers was that they would miss the human factor. Hence, they would have a robot for things like math, but not for something where human factor is important. They also expressed doubt about robots' lack of plasticity and ability to adapt to situations. Participants in the second group agreed that robotization would relieve human employees. Robots are also faster and more precise than humans. In the second group, we also came to a problem of universal salary. To the second question, they all answered negatively and argued the same way as the participants in the first group – robots lack human factor.

Second part of the first video [1] was showing a robot named Pepper and her interaction with her owners. I wanted to know if they would have such a robot in their home. All participants in the first group expressed doubt about having a robot as a friend or a companion. It would feel odd to have a robot friend, again because of their lack of "human-ness". The answers in the second group were not as I had expected. Three of the participants were widows and they all answered that they would like to have such a companion, but at the same time, they expressed doubt about how they would use it, because they didn't know anything about robots.

Third part of the video [1] shows a robot which is used as outer skeleton for patients in the process of rehabilitation after a stroke or some other accident. Robot is connected to the patient through electrodes on muscles and it helps the patient walk. After therapy, the odds of walking again get higher. Participants in both groups said that it was a really useful robot. Regarding this robot we also talked about robot-surgeons; would they prefer a human or a robot surgeon? They said that a robot could be more precise, but they were doubtful about its ability to decide fast if something would go wrong.

In the next video [2] we saw a robot similar to Pepper. It was working as a companion and an animator for exercise in a home for the elderly. Participants in the first group weren't that eager about a robot employee in a home for the elderly. In the second group, they said it would be fun to have additional staff that would be robots.

The last set of questions was about general impressions of robots in our everyday lives. Participants in the first group were sceptic about the universality of robots and missing the human touch, which they found very important in human communication. Participants the in second group came to a similar conclusion. Though, as they said, they didn't have enough knowledge and understanding to judge this.

2.4 Discussion

This pilot study had two groups with four participants each. This means the sample is very small and unrepresentative. This is why the results cannot be used for the whole population of the elderly. Though this study was useful for the purpose of making a starting point for further investigation.

Participants in the first group all had a university education. while the participants in the second group did not. My hypothesis was that the level of education will influence how participants comprehend the robots and its use. Study showed what I had expected; participants in the first group were more open to the usage of the robots. What people think of usage of robots also depends on the culture and where they live. Robots are well accepted in Japan, but in Europe there are still some doubts about it. What could also influence the results is the fact that all participants live alone in their own homes, and not in homes for the elderly. I think people in homes for the elderly often feel neglected by their family and have a bigger need to have someone close to them, even if it is a robot. Because I didn't have access to database, my sample was not random, but I used participants I or my mentor knew.

The aim of this pilot study was not to generalize the results but more to get a grip about the attitudes of the elderly towards robots and their presence in our everyday lives.

3. SIMILAR RESEARCH

Dautenhahn with colleagues [3, p. 1] made a similar research as the one presented before. They were investigating attitude towards potential robot companions. Their main aim was to figure out, how people perceive robots and how they feel about their presence in our everyday lives.

In their research there were 28 participants. Their research questions were: "Are people accepting of the idea of robot companions in the home?", "What are people's perceptions of a future robot companion?", "What specific tasks do people want a robot companion to perform?", "What appearance should a robot companion have?", " What are peoples' attitudes towards a socially interactive robot in terms of robot behaviour and character traits?", "What aspects of social robot-interaction do people find the most and least acceptable?". [3, p. 2].

They used two types of questionnaires: the Cogniron Introductory Questionnaire, used for providing demographic details and the Cogniron Final Questionnaire used for investigating people's attitudes and perceptions towards robots. First questionnaire enquired about participants' personal details (age, gender, occupation), level of familiarity with robots, prior experience with robots (at work, as toys, in movies/books, in TV shows, in museums or in schools), and level of technical knowledge of robots were rated according to a 5-point Likert scale. And the second consisted of questions like "What is robot companion?", "What tasks would you like a future robot to be able to carry out?", "How controllable, predictive and considerate should a future robot be?", "How human-like should the robot appear, behave and communicate?", etc. [3, p. 2-3].

Results showed that 82% of subjects liked or liked very much the concept of computing technology in the home compared to just under 40% for a robot companion. When asked what role they thought a future 'robot companion in the home should have', the majority of participants wanted the robot as an assistant (79%), a machine/appliance (71%) followed by a servant (46%). Younger participants even said they would have robot as a friend and companion. Majority would like future robots to carry out household job as vacuuming. Only 10% would trust a robot with babysitting. Most participants expressed that they would want the behaviour of a robot companion to be highly predictable. Participants' responses about human-like appearance, behaviour and mode of communication for a robot companion were somewhat mixed. 71% of subjects would want a robot companion to communicate in a very human-like or human-like manner. However, human-like behaviour and appearance were less desirable. 36% thought that the robot should behave either very human-like or human like, and 29% stated that a robot in the home should appear human-like or very-human like. [3, p. 3-4].

Suma sumarum; Most subjects saw the potential role of a robot companion in the home as being an assistant, machine or servant. Few were open to the idea of having a robot as a friend. Robot companions should also be predictable, controllable, considerate and polite. Their communication should be human-like, though their appearance and behavior are not necessarily human-like. [3, p. 4]

The current study was exploratory in nature and has revealed many findings that could be relevant for future research ideas and robot companion designs. However, a potential drawback of the study could be the self-selected university sample that was recruited to participate. Future studies should attempt to recruit a more representative population sample. Also, the cultural background of subjects, which was not accessed in the present study, is likely to have a significant impact on people's perception of robots. Moreover, none of the participants were older than 55 years, which means that
the views of an elderly population are likely to be under represented in this study. [3, p. 4]

To conclude, the current study explored people's perceptions and attitudes towards the idea of a robot companion in the home. Interesting and positive results have emerged, indicating that a large proportion of people are favourable to the idea of a robot companion. Results have highlighted the specific roles and tasks that people would prefer a robot companion to perform in addition to the desired behavioural and appearance characteristics. The finding that people frequently cited that they would like a future robot to perform the role of a servant is maybe similar to the human 'butler' role [3, p. 5-6].

4. COMPARISON OF BOTH RESEARCH

Both researches had a similar goal: create a picture of human attitude towards robots and their presence in our everyday lives.

In both researches participants found robots to be acceptable for carrying out household jobs. At the same time, they all rejected the idea of robot as a friend.

Regarding both researches I think people don't accept robots as substitutes for human beings, although they are already taking our jobs in the industry, help in our homes, hospitals, hotels, etc.

5. HUMANS AND ROBOTS

Both researches gave us an insight on attitude of humans toward robots. Now we can continue discussing about our relationship with robots as our partners, friends or lovers and how could this relationship affect humans and society. Relationship depends on characteristics of both groups.

Human characteristics that influence our relationship with robots are: emotions and the ability to anthropomorphize, which is the ability to see non-living things as living. Itis a psychological characteristic that we got through evolution. In this process human ascribe human characteristic to non-human objects or subjects. Emotions are, like the ability to anthropomorphize, a part of human cognition. We got them during evolution and they are helping us regulate our living in day-to-day lives. The consequence of both is that a human being bonds emotionally with a robot very quickly. This could be ethically problematic because such a relationship is only one-sided. This is why friendships or partnerships with robots could be ethically problematic.

There are also robot characteristics that influence the relationship: mobility, autonomy, way of communication. I will present a few experiments on how autonomy and mobility of the robot influence human perception of them. Regarding human psychology and robots' construction and mechanics we can get to another ethical problem: loss of tolerance towards another human being.

5.1 Autonomy and mobility experiments

Scheutz [5, p. 208] was doing a research on how autonomy and mobility influence human perception of robots. Autonomy is considered as the ability to carry out a task without human intervention. And there can be different levels of autonomy. We can give orders to a robot such as "Move 3m ahead" or "Find the evidence for stratification in this rock". It is obvious that the robot that can carry out the second order, has a higher level of autonomy. Levels differ among them, depending on the ability of comprehension, analytics, communication, decision making … [5, p. 208]. Scheutz made three different experiments.

5.1.1 Dynamic Autonomy

In this task, a human subject worked together with a robot to accomplish a team goal within a given time limit. While both the human and the robot had tasks to perform, neither robot nor human could accomplish the team goal alone. In one of the task conditions (the "autonomy condition"), the robot was allowed to act autonomously when time was running out in an effort to complete the team goal. As part of this effort, it was able to refuse human commands that would have interfered with its plans. In the other condition (the "no autonomy condition"), the robot would never show any initiative on its own and would only carry out human commands. Human subjects were tested in both conditions (without knowing anything about the conditions) and then asked to rate various properties of the robot. Overall, subjects rated the "autonomous robot" as more helpful and capable, and believed that it made its own decisions and acted like a team member. There was also evidence that they found the autonomous robot to be more cooperative, easier to interact with, and less

annoying than the nonautonomous robot. Surprisingly, there was no difference in the subjects' assessment of the degree to which the robot disobeyed commands (even though it clearly disobeyed commands in almost all subject runs in the autonomy condition while it never disobeyed any commands in the no-autonomy condition). We concluded that subjects preferred the autonomous robot as a team partner. [5, p. 209]

The problematic point of this relationship between human and a robot is, that it is one-sided. Robots are not capable of forming emotional bonds or feeling emotions. At this moment, they are only capable of recognizing human emotion and act accordingly-depends on how they are programmed. In my opinion, genuine features of partnerships or friendships are reciprocity of emotions and respect and belonging. This makes a human happy and fulfilled. Today, robots are not as sophisticated and developed to be able to feel the emotions or be capable of forming an emotional bond with its owner. Because of that, the relationship with a robot cannot be as good as the relationship with a living being. If humans, instead of a robot, buy a dog, this relationship will fulfill reciprocity.

5.1.2 Affect Facilitation

Here, instead of making autonomous decisions, the robot always carried out human orders. However, in one condition (the "affect condition") it was allowed to express urgency in its voice or respond to sensed human stress with stress of its own (again expressed in its voice), compared to the "no-affect condition," where the robot's voice was never modulated. Each subject was exposed to only one condition and comparison was made among subject groups. The results showed that allowing the robot to express affect and respond to human affect with affect expressions of its own—in circumstances where humans would likely do the same and where affective modulations of the voice thus make intuitive sense to humans—can significantly improve team performance, based on objective performance measures. Moreover, subjects in the "affect condition" changed their views regarding robot autonomy and robot emotions from their pre-experimental position based on their experience with the robot in the experiment. While they were neutral before the experiment as to whether robots should be allowed to act autonomously and whether robots should have emotions of their own, they were slightly in favor of both capabilities after the experiments. This is different from subjects in the no-affect group who did not change their positions as a result of the experiment. We concluded that appropriate affect expression by the robot in a joint human–robot task can lead to a better acceptability of robot autonomy and other human-like features, like emotions in robots. [5, p. 209-210]

5.1.3 Social Inhibition and Facilitation

While the previous two studies attempted to determine human perceptions and agreement with robot autonomy indirectly through human participation in a human–robot team task (where the types of interactions with the robot were critical for achieving the goal, and thus for the subjects' views of the robot's capabilities), the third study attempted to determine the human-likeness of the robot directly. Specifically, the study investigated people's perceptions of social presence in robots during a sequence of different interactions, where the robot functioned as a survey taker as well as an observer of human task performance. Our experimental results showed that robots can have effects on humans and human performance that are otherwise only observed with humans. Interestingly, there was a gender difference in subjects' perception of the robot, with only males showing "social inhibition effects" caused by the presence of the robot while they were performing a math task. Post-experimental surveys confirmed that male subjects viewed the robot as more human-like than did the female subjects. [5, p. 210-211]

The results showed human attitude toward autonomous robots. People prefer autonomous robots, when they have to finish the task together. Humans prefer characteristics that shows human-like autonomy. It is important to acknowledge, that this might not be the case in a situation outside the laboratory. Let us now check the situation outside the laboratory.

5.1.4 Robots, mines and soldiers

Now we will talk about a robot that is used for detonating the mines. It goes over the dangerous mine field and when it steps on it, the mine blows up/explodes. The robot was made by Mark Tilden who was present in an experiment. Every time the robot found a mine, it was left with less and less limbs. When it only had one left, it was still pulling itself forward. Then, Tilden stopped the experiment saying he could not stand the pathos of watching the burned and crippled machine drag itself forward. This test is in his opinion inhumane. [5, p. 211]

Whether or not "inhumane" was an appropriate attribution, the fact remains that the only explanation for not wanting to watch a mindless, lifeless machine, purposefully developed for blowing up mines, destroy itself, is that the human projected some agency onto the robot, ascribing to it some inner life, and possibly even feelings. [5, p. 211]

We can conclude that the more sophisticated the robots get, the bigger will be the danger for humans to form one-way emotional bond with such robots. One-way emotional bonds are potentially dangerous because we could be doing things we otherwise wouldn't. For example: if we would trust robots too much, it could get us to buy some articles we don't need, just because it said so. And it could say so, if it were programmed this way. [5, p. 216] I also think one-way emotional bonds are harmful for people who bond this way. Relationships we have should be reciprocal, because this gives the fullness and depth to the relationship.

People who are selling robots should inform their clients that robots don't have emotions and cannot form emotional bonds. This way, they can instill knowledge about non-reciprocal relationships.

Robots are made to make our lives easier and better, which doesn't mean there cannot be some bad consequences. This is why it is very important to think about all possible outcomes of having a robot in our home. And because of the possible negative consequences we should also prepare some safeguards. These safeguards could be laws or guides on how robots can be made, and obligatory informing of clients that robots don't have emotions and cannot bond this way. Which still doesn't prevent us from bonding to robots. [5, p. 217-218]

To conclude, Scheutz approached the problem with doubt in such robots and with a lot of criticism. I think his way of thinking makes sense because society is not informed enough and not everyone is educated on the topic, or they don't even think about negative consequences. Usually people and society are so fascinated by the achievements of science, they forget to think about the bad consequences. We should somehow prevent that.

5.2 Partnership with robots

At some point, the robots could also become partners and lovers. I think partnership is one of the most important relationships we have in our lives. Partner (husband/wife) is someone you supposedly spend the rest of your life with. We choose our partners in many different ways, by different criteria: regarding looks, personality traits, goals, way of communication … What is also important in partnership is reciprocity of respect and emotions. Because of what we have said until now, we can easily claim that a robot would not make a good partner. Downside of having a robot for a partner is also that they are not equal to us; we chose them, they are made the way we want them to be, we don't have to compromise with them, because they always agree with us, etc. Because of how robots function and how they influence humans and our perception of human beings and relationships, partnership with robots could bring us more bad consequences than good. I think the only good outcome would be that the person wouldn't be alone. Otherwise it would change our perception on how relationships work: it is possible that humans would lose patience towards another human being, their potential partner, because they would be used to not compromising. Also, other humans don't think the same way as we do, and have different goals and taste in different things in our lives. Robots would support the fact that we don't have to work for a relationship.

We could make criteria on who is justified to have a robot as a partner, but how would it look? Will the justified be someone who got dumped by his or her first girlfriend/boyfriend? Someone who got divorced for the second time? Or someone who is working 12 hours a day and doesn't have time for social interaction? There are many different questions which could help us define these criteria, but how will we choose the best one? This could be a topic for a whole another article, so I will end it here.

I argue that having a robot partner or a lover is not good.

First, it can clearly be argued that a peaceful, even loving interaction among humans is a moral good in itself. Second, we should probably distrust the motives of those who wish to introduce technology in a way that tends to substitute for interaction between humans. Third, for a social mammal such as a human, companionship and social interaction are of crucial psychological importance. Ultimately, it may perhaps be that we can scientifically analyze all of these psychological needs. It may also be possible one day to build technology that completely fulfills these needs. However, as things stand, we cannot be sure that our caring technologies are capable of meeting all the relevant psychological needs. [3, p. 238]

6. CONCLUSION

Robots are a part of our cultural and technological evolution. It is only a matter of time before they will infiltrate our society completely. I think the right time to prepare ourselves for that moment is now. I think all the scientists that are included in producing a robot should think about how such robots will influence the society. I also think the philosophers should help them think and rethink all the possible outcomes and consequences and how we could prepare for them or even prevent them.

Humans and robots are two different categories, and each have different characteristics which influence one another. We have to consider all of them, when we think about how the relationship among them will work.

In this article, I first presented my pilot study. The main aim of the study was to get a grip on how the elderly feel about robots in our everyday lives. Results confirmed my first hypothesis. Regarding second hypothesis, I was wrong in suggesting that better educated participants would be more open to having a robot in their home. After presenting my pilot study, I also presented a few other studies considering human relationship with robots.

I finished this article with the thought of why robots are not good for us as partners.

7. REFERENCES

[1] SBS Dateline. 2017. The Japanese robots used for companionship, household tasks and sex. *Youtube*. Retrieved September, 2019 from https://www.youtube.com/watch?v=YzzDLujpat4&t=207s

[2] Nine News Perth. 2017. Robot Therapy | 9 News Perth. *Youtube*. Retrieved September, 2019 from https://www.youtube.com/watch?v=FZegHxMimMk

[3] Whitby, B. 2012. *Do You Want a Robot Lover? The Ethics of Caring Technologies.* Robot Ethics: The Ethical and Social Implications of Robotics. MIT, Massachusetts, 233-246.

http://kryten.mm.rpi.edu/Divine-Command_Roboethics_Bringsjord_Taylor.pdf

[4] Dautenhahn, K. 2005. *What is a Robot Companion - Friend, Assistant or Butler?* 2005 IEEE/RSJ International Conference on Intelligent Robots and Systems.

http://homepages.herts.ac.uk/~comrklk/pub/Dautenhahn.etal_IROS05.pdf

[5] Scheutz, M. 2012. *The Inherent Dangers of Unidirectional Emotional Bonds between Humans and Social Robots*. Robot Ethics: The Ethical and Social Implications of Robotics. MIT, Massachusetts, 205-219. http://kryten.mm.rpi.edu/Divine-Command_Roboethics_Bringsjord_Taylor.pdf