

Close Enough to Care: Replacing Human Caregivers with Robots in Homecare

by

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REPLACING HUMAN CAREGIVERS WITH ROBOTS

COMMITTEE APPROVAL

The members of Kim Trynacity's Thesis Committee certify that they have read the thesis titled *Close Enough to Care* and recommend that it be accepted as fulfilling the thesis requirements for the Degree of Master of Arts in Intercultural and International Communication:

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CLOSE ENOUGH TO CARE

Abstract

The robot as caregiver is emerging as a viable option for limited use in seniors care facilities around the world. However there are concerns that as the ageing population steadily increases and caregivers become more scarce, the robot could replace humans as primary caregivers. Approaching the robot as a communication machine, the societal impact of robotic caregiving is explored through the first hand accounts of the very people who could be recipients of robotic care. Using an audience reception study, the views and feelings of senior homecare recipients are chronicled in a video documentary, which explores the expectations and attitudes towards both robots, and human caregivers. What emerges is a compelling look at the challenges of ageing in an increasingly digital and automated world. The seniors discuss overcoming loneliness, the value of close companionship, and feelings about robots that range from curiosity and amusement to fear and isolation.

Keywords: robots, elderly, care, companionship, attitudes, audience reception, communication, seniors

Close Enough to Care

<https://vimeo.com/130532486>

Password access: Close2care

By:

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For my video thesis, I conducted three audience reception studies with 30 elderly homecare recipients and three homecare recipients under 40, none of whom had experience with a robotic caregiver. As the elderly are among the least represented group in clinical studies (McMurdo, Witham, & Gillespie, 2005) audience reception gave the seniors a forum to express opinions in a familiar and comfortable setting with a group that self identified as homecare recipients. Audience reception is a particularly useful technique of reaching out and generating discussion amongst an under represented group such as seniors and the disabled (Livingstone, 2004). This audience reception method allowed me to directly link my research question of how the prospect of replacing a human caregiver with a robot impacts the perception of independence on homecare clients and connections to their community.

My sample included men and women over the age of 70 who were either able bodied or disabled, none of whom suffered from any noticeable forms of age related dementia. As homecare recipients, all participants receive assistance with daily living tasks such as getting dressed, and personal grooming. Their independent lives allow them to participate in activities and maintain relationships, while living in an apartment complex geared to their needs. I chose homecare recipients because they are accustomed to having someone enter their home to provide ongoing care yet still enjoy the freedom on independent lives.

My interest in this topic began with the realization that robotic development is expanding at a rapid pace yet the public remains unaware of the scope and implications. As a television news reporter, I must notice and respond to trends and public awareness. There seemed to be bubbling under the surface, a variety of research and proposals concerning the use of robots to serve senior

range of scientific areas such as human reaction to robotic gaze (Mumm & Mutlu, 2011), and to a robot's personality (Lee, Peng, Jin & Yan, 2006). With that in mind, I set out to meet with the very people whose lives would be directly impacted by a robotic caregiver (Sparrow & Sparrow, 2006).

My multimodal research project involved the showing of an animated film to a target audience of homecare recipients, the filming, writing and editing of an original documentary based on interviews from the focus groups, and this written analysis of my research. The documentary *Close Enough to Care* is the visual interpretation of data gathered in my research project (Trynacity, 2015).

While I've explored this topic over the past two years, the idea of robotic caregiving has gone from obscure to anticipated. As an example, there has been a surge in media attention to robots in both lifestyle and financial sections of mainstream and online publications. A recent article in the National Journal of Human Resource Management claimed substantially reduced costs and higher productivity by replacing just 18% of the workforce with robots (Bernier, 2015). Honda's lifelike robot Asimo was filmed kicking a soccer ball with the President of the United States in 2014 and it starred on a popular New York City network television talk show in 2015 (Trynacity, 2015).

Not only are robots entertaining and amusing, they are increasingly being considered as caregivers to the elderly (Turtle, 2012). As the world's ageing population increases, an imbalance is being created between needs of the frail elderly and caregivers (World Health Organization, 2014). This has fostered a worldwide race for elder care solutions that increasingly replace people with technology (Bielski, 2014; Bien & Lee, 2007; Sparrow & Sparrow, 2006).

The Robot as “Medium”

I approached the human interactive robot (HIR), as a communication machine. With that in mind, I drew from the theoretical writings of Marshall McLuhan (1964) who stressed the impact technology and the medium has on society. “The medium is the message”, wrote McLuhan in his description of the emergence of automation, new technology and communication (McLuhan, 1964, p.7). As an example, he argued the advent of television in Europe stimulated visual senses resulting in “American styles of packaging and dressing” while in America, McLuhan suggested the emergence of television promoted a stimulus in the spoken word, food and plastic arts (p.45). Defining medium as “any extension of ourselves” (p.46), the robot as a medium fits into McLuhan’s definition:

Whether the extensions of consciousness ... will be ‘a good thing’ is a question that admits of a wide solution. There is little possibility of answering such questions about the extensions of man without considering all of them together. Any extension, whether of skin, hand, or foot, affects the whole psychic and social complex. (McLuhan, 1964, p. 4)

Just as electricity, television, and radio had an impact on American and European society according to McLuhan, so too does the inclusion of robots into caregiving (Sparrow & Sparrow, 2006). Though robotic devices such as vacuum cleaners (Orange, 2014) may provide assistance and opportunity to caregiving, Sharkey and Sharkey (2012) argue there are extensive ethical issues that must be considered.

The impact of new technology emerged as a unique topic of discussion in 1954 when renowned mathematician and philosopher Norbert Wiener warned that automation was the

“equivalent to slave labour” (Wiener, 1954, p.162) displacing people from their jobs. At the same time, he also cautioned of what he called the “worship of progress” (p.41), and how a rush to embrace technology could result in unanticipated negative impacts on society. “We are the slaves of our technical improvement” Wiener wrote, adding that radical modification of technology-required society to “modify ourselves in order to exist in this new environment” (p.46). Wiener first coined the term “cybernetics” and stressed the importance of message delivery and comprehension between people and machines (Wiener, 1954) .

The futuristic prognostications Wiener wrote of in 1954 seems like ancient history, but his warning of becoming “slaves” to technology remains relevant (Wiener, 1954, p.46). As HIR expands to seniors care, there is a growing body of research giving weight to the argument humans are capable of forming intimate relationships with a robot in the same way as they would a pet or a person (Lee, Peng, Jin, & Yan, 2006). Lee’s study of “personality traits” in robots concluded humans are more able to form “parasocial” relationships with robots depending on the introversion or extroversion of the robot (Lee et al., 2006).

Much research to date has focused on the scientific aspect of communication between humans and robots. There is however, a gap in understanding how the elderly feel about a robot replacing their human caregiver (Sharkey & Sharkey, 2012; Sparrow & Sparrow, 2006).

Prominent technology researcher Sherry Turkle suggest the encroachment of robots into mainstream senior’s care, poses a real “danger” that robots will eventually replace people (Turkle, 2012, p.105). In her book *Alone Together*, Turkle writes the elderly are the first to have companionate robots “marketed to them” as a quick fix to societal problems of caregiving and loneliness. Sharkey and Sharkey (2010), and Sparrow and Sparrow (2006), suggest social

interaction with the elderly is not restricted to friends and family, and that having a robot take on the “dirty and mundane” tasks of cleaning and housekeeping could deprive the elderly of valuable social interaction (p.7). The removal of a caregiver working with a senior could increase loneliness and depression in the elderly population, struggling to maintain a social network (Donaldson, Evnin, & Saxena, 2005; Sparrow & Sparrow, 2006). In light of these trends in research and critical evaluation, this study examines exactly how a sample from the target population of senior adults responds to the proposal of having robots serve as their caregivers.

Method

This study employs a multi-step method of examining participant reaction to robotic caregiving through audience reception. Audience reception was popularized by cultural theorist Stuart Hall’s 1973 encoding, decoding reception theory that messages are embedded within text, and then decoded by an audience (Hall, 1993). Hall (1993) further theorized how an audience reacts to the message of the text is largely dependent on their cultural background. According to Janet Staiger (2005), audience reception involves how an audience comes to form meaning out of mass media. Factoring historical circumstances and context Staiger asks: “*How* does a text means? For whom? In what circumstances ? ” (p. 2).

The research method of audience reception is a particularly useful technique of reaching out to a specific group and generating discussion about issues that might not otherwise be raised (Buckingham, 2009). Relying heavily on interview methods, audience reception is a group activity that prompts discussion around the meaning behind a video or media presentation viewed by an audience (Buckingham, 2009). It allows audience members to explore their

interpretation in a group setting without being singled out, and allows participants to freely “express themselves” (p.18) through the guidance of an interviewer.

Three groups of homecare recipients were recruited to view a short animated film *Changing Batteries* (Gi, Ng, Hui & Darvish, 2014). *Changing Batteries* (Gi et al., 2014) is a fictional portrayal of a lonely elderly woman who develops a close relationship with a tiny robot given to her by her absent son. The robot performs homecare duties such as cleaning her home, and dispensing medication while providing companionship. Featuring themes of: change, ageing, and companionship, I was able to trigger an evocative discussion about the meaning of the film, and what life would be like with a robotic caregiver.

Through initial email, I contacted the Greater Edmonton Foundation, a non-profit housing agency for seniors, and the Cerebral Palsy Association of Alberta. These organizations put the word out verbally to their tenants and members, then sent out notices about my project. The films were shown to groups in common areas of their apartment complexes. To record their response to *Changing Batteries* (Gi et al., 2014), I videotaped the group discussions using a stationary video camera mounted on a tripod, while roaming through the audience with an iPhone and external microphone. The iPhone acted as a second camera enabling me to capture different camera angles while allowing me to mingle with the participants and ask open-ended semi structured questions.

One audience group included a small number of younger participants who because of their disabilities, required ongoing homecare assistance. The other two audience groups were made up entirely of senior homecare recipients. Using an ethnographic method of conducting open-ended interviews, the audience was invited to discuss the film *Changing Batteries* (Gi et

al., 2014), and issues regarding robots as caregivers. Their responses were recorded on video, and five of the seniors were selected to participate in more in depth interviews. The resulting video footage was then edited into a documentary titled *Close Enough to Care* (Trynacity, 2015).

Acting as both interviewer and camera operator inhibited my ability to continually observe the participants closely, and to listen carefully to what they were saying during our lengthy discussion. I had my eye on the record button of the iPhone to ensure the system was operating smoothly, while trying to observe the participants. The advantage of videotaping the entire session however is that I was able to review on tape what I may have missed in person.

I conducted one on one interviews with five of the participants. They were approached because of their interest in the topic, and eagerness to discuss their personal circumstances. I chose three women and two men who were all over 70. Each person had an interest area I wanted to probe, such as their close relationship with a caregiver, or their willingness to try a robotic caregiver. During the individual interviews, I followed the same question line I asked in the larger group. I again used the fixed camera and IPHONE, but instead of roaming around a room, I sat in one spot and was able to interact on a more personal level.

I chose visual ethnography, in the form of a video documentary format to present my research data. Visual ethnography takes research from the written word off the page, and elevates it to a greater publicly accessible venue (Pink, 2007; Berg, 2008). As Vannini (2012) suggests in *Popularizing Research*, making academic research accessible to large audience, allows for scholarship to become important to more than a select group. Showing my video through public screenings, and broadcasts on television, radio and the internet, it stands a good chance of capturing the attention of the public, and policy and makers. It also can function as Motion,

Leitch, and Weaver (2015) point out, as a means by which to “re distribute decision-making power” by mobilizing public opinion (p. 497).

I incorporated strong visual and sound effects such as music into my documentary to emphasize the most important findings of my research, and to draw viewer attention to the significance of what was being said (Berg, 2008). The emotional stories told in my documentary will resonate with caregivers, and those who may rely on caregiving in future. I believe this will prompt a public discussion about the societal impact of replacing humans with robots in caregiving, connecting directly to my research question.

Data Analysis

I undertook an inductive thematic analysis of the data by transcribing the audience reception sessions and the individual interviews with the seniors. I open coded the sessions and the interviews line by line to identify relevant comments and words used to describe feelings towards a robot and their human caregivers. Writing memos in the margins of the transcripts, and on a separate page I was able to extract reoccurring themes and observations to develop in vivo codes, based on exact words used by the participants (Pope, Ziebland & Mays, 2006; Seale 2012).

I looked for similarities in response, differences in attitudes and emerging patterns. I then grouped the in vivo codes into 5 categories as organizing principles in my presentation of the findings.

- personal touch
- losing control
- companionship

- irreplaceable
- surprising.

For the documentary, I then narrowed down the broad categories in 3 feature sections of (a) human touch, (b) love lost, and (c) fear.

Human Touch

By far, the most significant message to emerge from the interviews was the importance of “the human touch”. The seniors frequently mentioned “the little extras” done for them, which drew them closer to their caregiver. More often than not, participants said the functions and duties of the caregiver weren’t nearly as important, as the friendship and interaction (Trynacity, 2015). The friendship was expressed by “humor” and “teasing” that participants said, added to their relationship (Trynacity 2015). The social aspect of caregiving, supports the findings of Breazeal and Scassellati (1999), who identified that a robot must be able to “respond socially” to human cues to make humans believe it has “beliefs, desires and intentions” (p.1) and to Lee et al. (2006), which found that “people respond socially to social robots”(p.768).

My research found that the men and women overwhelmingly valued their personal relationship with their caregivers over any anticipated benefit from a robotic caregiver. While amused by the opportunity a robot could carry groceries home from the store, only two participants said they would ever consider using or needing a robot, much less replace their human caregiver. This finding supports a study on human robotic interaction, which concluded that low expectations of what it would be like to communicate with a robot tainted a person’s willingness to even attempt a relationship (Spence, Westerman, Edwards & Edwards, 2014).

The seniors in the audience reception groups were part of established social networks with “plenty of friends” who didn’t identify the need to have a robot to combat loneliness (Trynacity, 2015). This finding supports what Neven (2010) identified as a flaw by technology designers who were overly influenced by images of the old as wanting and needing a robot.

The importance of a human caregiver to the elderly adds to the larger body of research developed by Sherry Turkle (2012), Sharkey and Sharkey (2010), and Sparrow and Sparrow (2006) who take the position that replacing a human caregiver with a robot would have a negative impact on the social wellbeing of the elderly. Eliminating a human caregiver, according to Sharkey and Sharkey (2014) would reduce the amount of human social contact experienced by the elderly. Sparrow and Sparrow (2006) suggest interacting with cleaning staff or homecare workers is “something they look forward to” (p.146), and using a robot instead of a person to vacuum a floor, or clean a home would “remove a valuable opportunity for social interaction” (Sharkey and Sharkey, p.7).

Love Lost

The need for social interaction from a range of sources is magnified by the reality that as a person ages, they are likely to experience the absence of children, loss of spouse, and the ongoing sickness and deaths of people around them (Sparrow & Sparrow, 2006). The category of Love Lost in my documentary addresses the heart wrenching difficulty of retaining intimate personal relationships as one ages. “They come here sicker”, Irene Bosch says in the documentary, referring to the increasing number of elderly with dementia who move into her apartment block (Trynacity, 2015). Already seeing the impact, Irene was concerned about fewer residents taking part in regular card games, or residents not coming to the dining room for meals.

Both activities are considered an integral part of social life that connects the elderly to a community. “It’s sad”, Irene told me. “Pretty soon this place will be just like a nursing home” (Trynacity, 2015).

It became clear from what I was told, that friendships and intimate caring relationships are “extremely important” (Trynacity, 2015). When children are no longer around, caregivers take on an almost familial role they said; “I would miss it,” Gerald Gagnon said in the documentary. “Because I like to tease. Companionship changes as you get older” (Trynacity, 2015).

Fear

Participants were both amused and leery about robotic caregivers. Fear was expressed by comments stating that having a robot could make them mentally and physically dependent, causing them to lose control over their lives. They were also uncomfortable with what they described as the “coldness” of a robot, and the “long pointy things” conjuring up science fiction like images of monsters and demons (Trynacity, 2015).

Fear, was also surprisingly expressed by two participants under the age of 40. Both afflicted with cerebral palsy, one participant expressed willingness to use a robot, but both were concerned about becoming “lazy”, if much of what they now do themselves, could be done by a robot (Trynacity, 2015). The two were less apprehensive about the technology and found that it could be a way of preventing isolation as they age. Recounting a recent horrifying story, Julie told of how the rotting body of a dead resident was discovered in her building during a check for bedbugs. “I would never want to be one of those people who is so disconnected, that someone doesn’t notice you’re dead for a week” (Trynacity, 2015).

Irene Bosch, who was the only seniors who said she would “try” a robot, also offered the poignant observation that “ They could be very destructive. It would be so simple for them to get rid of you. I’m sure they were built to destroy, as well as do work” (Trynacity, 2015).

Conclusion

It wasn’t hard to gather a crowd for such an unusual presentation. After all, the lure of timbits, coffee and conversation alone was reason enough for men and women to gather for a short film and discussion about robots. The seniors enjoyed the film, applauding when it ended. While the main character dies at the end, the consensus was the little robot gave her company, and she wasn’t alone. They identified with the main character in the film, but felt it unlikely they could ever form a meaningful relationship with a machine.

What became clear from the participants is there was little enthusiasm for a robotic caregiver but greater concern about the removal of another person from their lives. Many of them have outlived their spouse and cope with absent children but find friendship from their peers, and daily homecare workers. They are also surrounded by ill and dying peers that only add to the difficulty of maintaining an active social life (Donaldson, Evin, & Saxena, 2005). What became obvious was the human caregiver served as a constant in the seniors’ lives when they frequently encounter death of those in their social and personal network.

Going forward it would be useful to conduct similar studies with homecare recipients who do not live in a seniors’ apartment complex. Their attitudes and experiences might be different given that they are not exposed to a regular social network offered by an environment designed to accommodate elderly residents. Given the limited participation of younger care

recipients, it would also be useful to study their attitudes towards robotic caregivers, and their future expectations.

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