Extended Abstract

The world population is ageing rapidly. While the phenomenon seems more advanced in Europe and North America, other areas of the globe are growing old as well. Such a phenomenon is attributed to a decrease in fertility accompanied by an improvement in survival. This seems to be the scenario in Portugal. It is expected that, by 2080, the ageing index will have more than doubled while the active population will have decreased significantly. Due to the combination of these two factors, by 2080, Portugal should have 137 elderly people per every 100 people of active age. As someone ages, their nervous system tends to deteriorate which causes the processing of information to become more of a challenge. As a result, elderly people tend to suffer from memory troubles, difficulty in making decisions and in learning. At the motor level, movements that are quick or require the processing of external information become more complicated to perform. Due to a lack of perception when it comes to most senses, elderly people have trouble controlling their march, move slowly and are at an increased risk of falling. Additionally, conditions like dementia tend to become more common. In practice, what we are witnessing is an increase in the number of people requiring care from others while the number of individuals available to offer such care is decreasing. This reality causes a gap that, if not bridged, will compromise elderly people's ability to age with dignity and quality of life. A way of mitigating this situation might be appearing in the field of assistive technologies. Socially Assistive Robots (SAR) are a technology designed to help humans through social interaction. Despite still being relatively recent, they already have demonstrated potential in aiding people with deficits at motor and cognitive levels. As societies age and the number of caretakers available begins to reduce, SAR offer extensive support and monitorization allowing the elderly to live lives of quality and as independently as possible.

By having an ageing society, Portugal could benefit from the support of these robots. However, it is important to know if the elderly population would be open to them. The main objective of the present dissertation is to investigate how the elderly Portuguese population would respond to this kind of robots and, more specifically, what their propension for adoption would be. There are three research questions we look to find answers to:

1. Which factors determine SAR acceptance by elderly people?
2. Which of the robots' skills are of more value to the elderly?
3. What are the main concerns troubling the elderly when it comes to adoption?

With that in mind, the first step taken was to conduct a review of literature focused on the ways in which socially assistive robots can be of use to the elderly, what factors seem to have an impact on SAR adoption and what are common concerns permeating the adoption process. Secondly, in order to gather the opinions of the elderly Portuguese people regarding these matters, a quantitative study based on the application of questionnaires was conducted. The questionnaires were applied to people aged 65 and older being made available both online and on paper. Given the target population, they were made to be as simple and easy to understand as possible. In order to determine the relevant factors affecting SAR acceptance, an adaptation of the second version of the Unified Theory of Acceptance and Use of Technology (UTAUT) was created and deployed. This saw respondents rating a series of statements relating to the six dimensions of the adapted model – Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Behavioral Intention – on a five point-Likert scale anchored by "Strongly disagree" and "Totally agree". Some of these statements were adapted from the second version of UTAUT, others were adapted from the very similar Almere model and some were created by the author based on the gathered literature. The applied questionnaires also asked respondents to rate a series of robot functionalities and adoption concerns discovered during the review of literature stage. To analyze the data, gathered through the questionnaires, a combination of methods was used. Regarding the first research question, covariance-based Structural Equation Modeling (SEM) was utilized. Through AMOS (an add-on for SPSS), a measurement model (relates each latent variable to its items) followed by a structural model (looks into the relationships between latent variables) were created. Additionally, SEM was also used to test for the presence of moderation as the independent variables in the adapted model are moderated by some combination of Age, Gender and Technological Literacy (experience with technology). To find answers to the second and third research questions, Microsoft Excel was used.

The obtained results show Hedonic Motivation as being a relevant acceptance factor when it comes to the elderly Portuguese people. This means that an increase in the fun or pleasure expected to be derived from using the robot will likely result in an increase in

the intention to use it. It was also found that the impact of Hedonic Motivation on Behavioral Intention is moderated by Age, Gender and Technological Literacy. When it comes to the robot functionalities more favored by participants these were found to be emergency detecting and reporting, object monitoring and locating as well as fall prevention. It seems that respondents were more interested in functionalities focused on guaranteeing their safety as well as, possibly, convenience. Regarding the main preoccupations permeating the adoption process these were costs, risk of loss of human contact and risk of loss of human jobs. Cost were, by far, the most common preoccupation which seems to show the importance of finding solutions that people perceive to be cost efficient.

In summary, the present dissertation, while not being as widely encompassing as initially desired, offers some knowledge regarding the feelings of elderly Portuguese people regarding socially assistive robots. It shows which functionalities they value the most, which are their main concerns and what factors seem to have an impact on acceptance. Thus, hopefully, it serves to complement the knowledge base being currently built around this topic, illuminating and informing the work of individuals focused on designing socially assistive robots.