

Autonomy and Dignity: Principles in Designing Effective Social Robots to Assist in the Care of Older Adults

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Abstract. We introduce two key concepts for designing social robots to assist in the care of older adults: autonomy and personal dignity. These concepts are guiding ethical principles to occupational therapists. These principles provide a client-centric perspective to effective care that ensures the well-being of the individual and maintaining a good quality of life. The perspective of occupational therapists provides a valuable insight to designing socially assistive robots. These therapists are trained to work with clients to improve their quality of life and provide the training and therapy necessary for the person to independently perform important activities for daily living. A social robot can supplement the care of an OT, being available when a human caregiver cannot, and extend the assistance to be provided. However, it is critical that the assistance does not go too far and begin to impact the individual’s autonomy and sense of personal dignity.

1 Introduction

There is a growing interest in robots to help older adults, assist in the care of people with particular needs, and try to improve the quality of life of people. Research has investigated the possible roles of helping people in assistive care homes [17], survivors of stroke [10], people with dementia [11], and people with Parkinson’s disease [19, 2]. While robots that physically assist are an active topic of research, these examples all explore the role of a social robot in the care of older adults.

There are many safety and ethical issues that arise when dealing with a vulnerable population, especially when physical contact is involved. Some have emphasized that for this reason non-contact, social robots are preferred for assisting people from a vulnerable population, such as older adults [10]. However, many issues and challenges still remain even with a socially assistive robot. Issues involving personal dignity – including privacy, autonomy, freedom of pain, and sense of identity – are highly pertinent in exploring the design of social robots to help older adults.

We consider here a client-centric design perspective informed by some of the guiding principles used by professional occupational therapists. Maintaining autonomy and preserving personal dignity of the person are critical design concerns for socially assistive robots. In this paper we present these concepts from the perspective of occupational therapists who are commonly tasked with helping people have a better quality of life by providing the necessary therapy and training to do important activities of daily living. We relate each of these concepts to past and present work in designing socially assistive robots with the goal of reinforcing these client-centric design perspectives so that they may more commonly be incorporated into the design of future robots.

2 Background

“Occupational therapy is defined as the therapeutic use of everyday life activities (occupations) with individuals or groups for the purpose of enhancing or enabling participation in roles, habits, and routines in home, school, workplace, community, and other settings” [1]. Occupational therapists (OTs) serve to enable individuals to participate in meaningful occupations, activities they both need and want to do to promote their health and well-being. OTs evaluate, assess, and plan interventions that are client-centered as well as teach skills, adaptations, and/or modifications of the environment to participate independently. OTs work with people from various populations across multiple settings such as hospitals, schools, mental health field, skilled nursing facilities, and the community. A major emphasis of occupational therapy practice is a client-centered approach of looking at the client holistically (physically, emotionally, socially, psychologically). Each client brings with them their own unique background and perspective, and occupational therapy is a collaborative process that is client driven to meet the needs of each individual [13]. Acknowledging differences among clients is important in evaluation and intervention planning while upholding the code of ethics. Two topics of focus in this paper are autonomy and dignity. One of the core values of occupational therapy is maintaining the dignity of the individual – treating the person with respect during all interactions. One of the principles and standards of conduct for OTs is autonomy, respecting the individual’s choice and confidentiality. The individual has a right to make decisions based on the direct care of their own health [4]. OTs strive to maintain an individual’s dignity and autonomy during the therapy process.

As described above, the occupational therapy profession is revolved around “client-centered” practice where the service delivery process, especially the interventions, are individualized towards the client’s needs, goals, strengths, and challenges. The foundational guidelines of designing an individualized intervention is through a frame of reference, which are interrelated constructs that guide the OT practice [1]. Examples of these frames of reference are: Motivation of Human Occupation (MOHO) and Person, Environment, and Occupation (PEO) [8, 9]. MOHO considers three factors, habituation, volition, and motivation when used to evaluate the occupational performance of a client while PEO describes

how the fit among the person, environment, and occupation influences the occupational performance.

The degree of autonomy varies depending on the type and context of the intervention as well as the needs of the individual. For example, participation in a group exercise therapy allows for a different expression of autonomy compared to a degree of autonomy in learning self-catheterization for toileting at an outpatient setting. Despite these differences in autonomy, the goal of an OT is to use the frames of reference to identify factors that can help with maintaining autonomy and dignity. For example, a client learning to self-catheterize may feel intimidated and a loss of dignity during the intervention process. Using MOHO, an OT may ask the goals of the client, such as whether the client wants to and feels comfortable to self-catheterize in public restrooms or is motivated to learn self-catheterization for a situation when his/her caregiver is not present to do it for him/her. An OT may also analyze based on PEO on how the client should care for the catheterization tools according to the client's different environmental demands, such as at a school, park, and home. During the intervention process, the OT works with the client to meet their goals while ensuring their autonomy and dignity. From the examples listed above, some interventions may range from intimate subjects to personal space and maintaining the dignity of the person and their choice of participation relates back to that client-centered practice and maintaining the respect towards the individual.

3 Autonomy

Having a robot provide just the right amount of assistance and enabling the person to do tasks on her own are important elements to supporting and maintaining autonomy of the individual. This is perhaps an advantage to designing social robots, ones that do not physically intervene. A social robot used for physical therapy can provide encouragement and verbal suggestions and no physical contact, thereby avoiding any safety concerns arising from the physical contact [10]. Alternatively, a social robot can provide verbal and gestural assistance to a person sorting medications while not physically do the sorting task itself [19]. Both of these are examples where the robot provides social assistance, not physical, leading the person to do that task on her own and thus enabling the person to care for herself.

In evaluating the effectiveness of robots, it can be challenging to correctly measure the impact of the robot. A robot-centric design perspective could result in evaluating the success of the robot by measuring the task success, completion rate, time to completion, etc. For example, success rate was used to measure adherence to a social robot providing exercise instruction to older adults [6]. While exercise should improve the quality of life of the person interacting with the robot, the fact that they did all the exercises does not imply that the person is better off. If the robot provides too much assistance (though always leading to task success), the person could end up makes few decisions of her own and lead to a lower sense of autonomy. The person could become dependent on the

robot to perform the exercises. Enabling the person to do the exercises on her own or giving the person the power to do the exercises when necessary should lead to the person being able to make the right decisions for her own health and contribute to the person's autonomy. We propose that the design metrics take a client-centric perspective instead. It is about empowering the person to create a better quality of life for herself and having a robot provide assistance to help the person only when and where needed. Better metrics may be how much can the person do on their own, without prompting.

But even for a social robot, too much assistance can still be an issue. Need to regulate how much assistance is provided and not always provide the most descriptive or directed assistance possible. Our recent work in designing a social robot to assist in the sorting of medications [19] implemented four levels of assistance in accordance to the guidelines provided in the manual for Performance Assessment of Self-Care Skills [12]. As the person has more difficulty in the task, the assistance provided increases. Initially the assistance is categorized as *verbal supportive*, but then it may escalate to *verbal non-directive* and then *verbal directive*. Similarly, a *graded cueing* technique was used to provide verbal assistance in an imitation task with a social robot [7]. While this work focused on children with autism spectrum disorders, the same principle applies to older adults. The end goal in both of these works is to only provide just enough assistance and not immediately jump to the most complete or direct assistance, thereby allowing the individual to figuring things out for herself and thus supporting the autonomy of the person.

4 Personal Dignity

The loss of autonomy can impact one's sense of personal dignity. The sense of self and an independent identity diminished due to an increased dependence on an external resource. A robot that provides too much assistance or simply does the task for the person can lead to a loss of autonomy and thus a loss in personal dignity. But there are other ways in which a socially assistive robot can impact an individual's sense of dignity. A social robot can infringe upon a person's privacy and not response personal boundaries. Also, the emotions of the person and the unique experiences of that person need to be respected by a social robot that is to assist an older adult.

Privacy is an important issue when caring for people, and there has been a significant amount of literature investigating the impact of technology on a person's privacy [14]. Research has also explored the specific role of socially assistive robotics in relation to privacy [5]. These works have presented the risks associated with privacy, but they do not necessarily address how to approach privacy concerns. One opportunity afforded by social robots in dealing with privacy is allowing the person to discuss with the robot what is to be shared and what is not [18]. This can be an active negotiation or dialogue between the robot and the human. Ideally, the robot will be able to present arguments for sharing some relevant information with care providers and family while still

respecting the privacy wishes of the person. Having the person take an active role in choosing the boundaries allows the person to feel that his/her privacy is being respected.

Another important way for a social robot to preserve a person's dignity is to recognize and appropriately respond to the person's emotions. While there has been a significant amount of work in computational approaches to recognizing emotions from speech and facial expressions, an important piece is recognizing the moral emotions, such as anger, shame, and guilt. It has been proposed that guilt can be used to influence the actions of the robot [3] to avoid potentially immoral actions, hopefully leading to a preserved dignity [2]. Others have also explored using displays of empathy in socially assistive robots as a means of demonstrating perspective taking on the part of the robot [16]. It has been argued that displaying empathy communicates the robot's ability to recognize the person's emotional state and conveys a message that the person's perspective is important to and considered by the robot [15]. By taking the perspective of the person and respecting that person's emotional state, the robot communicates that the identity of the person is important, and this reinforcement of the individual's identity can contribute to a preserved sense of personal dignity.

5 Conclusion

Autonomy and personal dignity are critical elements for ensuring the safety and well-being of an older adult, and these principles need to be incorporated into the design process for social robots. Autonomy reflects the right a person has to make decisions based on the direct care of her own health. Treat a person with respect and recognizing the individual's needs, feelings, and privacy contribute to preserving a sense of dignity. Examples emphasizing these principles in the design of robots exist, but more work needs to consistently consider these guiding principles that focus on the health and well-being of the person first and foremost. By taking this client-centric perspective and the lessons learned from occupational therapists, we can increase the chances of designing robots that improve, or at least maintain, the quality of life of older adults that are being assisted by social robots.

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