Research In Focus: A Weekly Digest of
New Research from the NIDILRR Community

What Would Help Older Adults Trust Robots to Help Them with Personal Care?

A study funded by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR).

As the world population ages, more and more people will be living with age-related disabilities. These individuals may require assistance with personal tasks like bathing, managing medications, and housework. Robots can be designed as a solution to help older adults with personal tasks, so they can live independently. However, some older adults may have difficulty trusting a robot with their care needs. In a recent NIDILRR-funded study, researchers asked older adults about what it would take for them to trust a robot caregiver. They wanted to find out what physical and personality traits the older adults expected a hypothetical robot caregiver to have in order to trust it with their personal care needs.

Researchers at the Rehabilitation Engineering Research Center on Technologies to Support Successful Aging (TechSAge RERC) interviewed 24 older adults who received regular caregiving assistance from another person. All participants were over 65 years old with an average age of 81; lived either in their own homes or in assisted-living arrangements; and received caregiving assistance at least 4 days per week for about 1-3 hours per day on average.

The researchers asked the participants to consider what it would be like to have a robot help them with four tasks: bathing, transferring into a wheelchair, reminding them to take medications, and household chores such as cooking and laundry. For each task, the researchers asked the participants how they would want a robot caregiver to be like in order to trust it with the task. Finally, the participants answered questions about their confidence in using a robot and whether they would prefer to trust a human or a robot for home-care tasks.

The researchers found that the participants described three main types of characteristics they would want in a robot caregiver:

- Professional skills: The participants said that they would want a robot caregiver to be precise, predictable, and skilled in performing the tasks it was designed to do. They also said they wanted the robot to be gentle with tasks involving touch (bathing and transferring) and to be able to lift and handle their body safely without causing pain. For medication reminders, the participants wanted to ensure that the robot provided reminders on time.
- Personal traits: The participants said they wanted a robot caregiver to display kindness and sensitivity toward their care needs and to be friendly toward others in their home, including family and pets. They also wanted a robot caregiver to be

streamlined and pleasant to look at, and to be made out of material that was comfortable to touch.
- Communication: The participants said that in order to trust a robot caregiver, they would want it to communicate clearly with them about what it was doing, and to easily respond to their verbal or physical input.

The researchers found that, generally, the participants were not confident about their ability to use a robot caregiver and preferred to trust a human to assist with home-care tasks.

Based on the feedback from the participants in this study, the authors recommended several design considerations for robot caregivers. These include:

- Skills: The authors recommended that robot caregivers be designed with particular caregiving tasks in mind, and that they be optimized for those tasks. For example, a robot that helps with bathing may need to be designed with a focus on gentle touch, while a robot designed to help with medications may need to be designed with a focus on timeliness. Robots that might serve multiple functions should also be designed to meet expectations for individual tasks.
- Personalization: The authors recommended that robot caregivers have customizable settings so that older adult users can personalize them to match their values and preferences, such as order of tasks or standards of cleanliness, and to accommodate changes in their health.
- Accessibility: The authors recommended that robot caregivers have easy-to-use input methods to communicate to, and have clear and accessible communication from, the robots so that communication between the robot and user is as easy as possible. For example, having easily to navigate command menus to program task and preferences will help with controlling the robot, and having adjustable volume and high contrast screens can help ensure that older adult users can easily hear and see prompts from the robot.

The authors noted that the participants in this study did not interact with actual caregiving robots, as that technology is still in development and may be years away from being commercially available. In addition, the participants in this study may have had limited experience with other newer technologies. The authors recommended that robots be designed so that they are easy to use, and older adults can feel confident in their ability to program and use them for various tasks. As the more technology-savvy generations age, their experience and preferences may impact future design and development of caregiving technology like robots.

As people are living longer, including people with disabilities, caregiving technologies like robots may make it possible for individuals to continue to live independently in the community, rather than moving into care facilities. These technologies may also reduce the burden on family caregivers. Developers may want to include potential users in the process of designing and building robots to ensure they meet the target user's needs

and expectations and provide comfortable and successful interactions between humans and robot care providers.

To Learn More

The TechSAge RERC, along with the RERC on Wireless Interactive Technologies, developed an Innovative Design Creation Process Workbook which design teams can use to define a problem and design a technology solution to meet the needs of older adults with and aging into disability http://techsage.gatech.edu/sites/default/files/Tech%20%26%20Aging%20Summit%20Workbook%20FINAL.pdf

At the TechSAge State of the Science Conference, Brenna Argall, PhD, discussed how robotic autonomy, like the technology behind driverless cars, can support human independence https://youtu.be/-ivZzSVa1t4

The Pew Research Center for Internet and Technology published a report on Americans' attitudes toward robot caregivers http://www.pewinternet.org/2017/10/04/americans-attitudes-toward-robot-caregivers/

To Learn More About this Study

Stuck, R.E. & Rogers, W.A. (2018) Older adults' perceptions of supporting factors of trust in a robot care provider. Journal of Robotics, 2018. This article is available in full text from the publisher and from the NARIC collection.

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