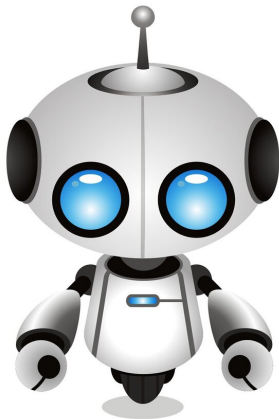


Children think robots can help the elderly—but not their own grandparents

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A study of children's interactions with robots was carried out at the Norwegian research fair held in every major city. It is an annual national event where children gain insight into science and what researchers do.

Roger A. Søråa and his research team at the Norwegian University of Science and Technology's (NTNU) Department of Neuromedicine and Movement Science set up three different robots. Søråa studies people's relationship and interaction with robots. Children ages 6-13 participated in the study.

Several countries—in particular Japan where Søråa has had research visits—are looking at how robots can be helpful in elderly care, including helping patients with dementia with certain tasks and remembering things.

"As the current discourse on [social robots](#) relates strongly to elderly care, it's interesting to learn what young people think about robots taking care of the elderly, especially in the context of their own older family members," says Søråa.

The researchers recently published the article "Children's Perceptions of Social Robots: a study of the robots Pepper, AV1 and Tessa at Norwegian research fairs" in the journal *AI & Society*.

Three completely different robots

The children at the research fair got to meet three different robots. One was the [robot](#) Pepper, which is a human-like figure that is 120 cm tall and that can do many different tasks.

The autonomous humanoid robot is an advanced social robot designed primarily as a personal assistant.

Pepper can talk and carry on simple conversations, but in Norway it has challenges with the country's many different dialects, which make it harder for Pepper to learn the Norwegian language.

But it can move around and dance, and can be trained to perceive when someone falls and notify an alarm system, for example. It can provide safety for elderly persons who live alone and who are a bit frail.

Tessa the flower pot

Another robot is simply designed as a flowerpot with eyes. It's called Tessa. How on earth can a flower pot contribute to the care of the elderly, one may ask?

Tessa is a physical avatar for a home sensor system and dedicated to people with dementia who live alone.

For example, Tessa can learn to recognize the habits of the person it resides with. Through sensors in the refrigerator it could learn that the person in question usually opens the refrigerator door and eats breakfast at 9 a.m. every day. If the fridge is not opened at the usual time, Tessa can remind the person that it is now time to have breakfast. For people with dementia who forget and get confused about time, getting a reminder can be helpful.

"We're now testing this in a dementia project at NTNU, and we're observing that the robot quickly becomes part of the home, along with the normal flower pots. However, the sensor systems are what the relatives appreciate most," says Søråa.

The third robot, AV1, is aimed at children who cannot attend regular school because they are physically unable to, for example because they are sick. The school robot AV1 is shaped like a head with eyes that follow the classroom instruction, and a student can control the robot from home and follow what's going on in class using a mobile app.

Skeptical of Pepper

"Our analysis is based on quantitative survey data from the children about the robots and on qualitative discussions with them at the research fair. By comparing three different types of social robots, we found that their presence can be understood differently based on their function, design and 'aliveness,'" says Søråa.

Pepper was the robot that the kids were most skeptical towards.

"The children's attitudes towards robots were relatively positive, curious and exploratory, but they thought Pepper was a little scary. It probably partly has to do with Pepper being quite big and the same height as some of the kids," Søråa says.

"When the robots have a clear task, like Tessa the flower pot robot and AV1 the teaching robot, they become less intimidating and easier to relate to since we can more readily understand what their task is. Research has also shown that the more a robot looks like a human, the more frightening it

becomes," says Søråa. He says the phenomenon can be explained by the Uncanny Valley hypothesis.

The Uncanny Valley phenomenon suggests that acceptance of robots declines the more humanlike they become. We can feel "fooled" when we realize the robot is not a human being, but some other creature.

But in Japan the public is more accepting of humanlike robots.

Tessa best for grandparents

The children were generally positive towards robots as a help with different tasks for older people. But when asked if their own grandparents could benefit from robots, they were more doubtful. Whereas 76 percent agreed that Pepper could help the elderly, only 60 percent thought their own grandparents would benefit from Pepper's help.

"This difference could potentially be explained by how the children perceive their own grandparents as relatively fit," Søråa says.

A quote from one of the children was, "I think they [robots] could help my great-grandfather because he is quite forgetful and he lives alone."

"This child thinks that the great-grandparents, but not the grandparents, could benefit from the robot, and it indicates that the child thinks the grandparents are too active to need robot help," says Søråa.

It turned out that the children were most positive about the flower pot robot Tessa as a helpful tool. More than 97 percent agreed that Tessa could help the elderly and 86 percent thought that Tessa would be a useful feature in their own grandparents' house as well.

The [children](#) liked the idea of a talking flower pot or robotic plant that had the specific task of reminding the elderly of meals and other activities.

More information: Roger Andre Søråa et al, Children's perceptions of social robots: a study of

the robots Pepper, AV1 and Tessa at Norwegian research fairs, *AI & SOCIETY* (2020). [DOI: 10.1007/s00146-020-00998-w](https://doi.org/10.1007/s00146-020-00998-w)

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