Application Fields and Innovative Technologies

Exploring Older Adults' Perceptions of Trust in Human-Robot Interactions V. Falcon, Y. Hu, W.A. Rogers. *Gerontechnology* 25(s)

Purpose As the number of older adults increases, so will the cost of care and demand for care providers in later life. There is currently an insufficient number of care providers to meet that demand (1). Robots have the potential to fill this need and support older adults to live independently and age successfully. Notably, trust, as an essential component of human-robot interaction, is key to meeting the potential of robots to support the needs of older adults. Part of understanding trust is knowing how to measure trust and how to assess changes in trust. Although there is research to understand what factors influence trust between older adults and robots, little attention has been paid to how the unique needs and attributes of older adults may further influence trust. To advance understanding of human-robot trust for older adults, we need to explore how robot users are conceptualizing trust and what trust issues they are considering when interacting with robots. To understand these unique considerations and perspectives, we examined how trust is being defined and measured and whether this aligns with older adults' perceptions of trust in robots. (RQ1) How well do current measures of trust assess older adults' trust in a domestic assistive robot? (RQ2) What human, robot, and task characteristics influence older adults' perceptions of trust in robots? (RQ3) What are older adults' perceptions of robots making errors or doing unexpected things, and how do they think it impacts their trust? **Method** Twelve older adults (N=12; aged 62-81) participated in a mixed-methods study aimed at exploring their thoughts about trust and their perceptions of current questionnaires meant to measure trust in robots; namely, the MDMT v2 (2), the Human-Robot Interaction Trust Scale (3), and the Almere Model (4). Participants completed characterization questionnaires to assess their demographics, familiarity with robots, technology experience, and predispositions to trust machines. Participants then observed and interacted with the Stretch assistive robot (https://hello-robot.com/stretch-3-product), while it performed two domestic tasks. Before and after participants interacted with Stretch, they completed the three validated trust questionnaires, followed by a semi-structured interview assessing their perceptions of the questionnaires, the advantages and shortcomings, and exploring other topics of trust in robots. After a short break, participants watched Stretch execute an unsuccessful task (e.g., the robot committed an error during the task) and were interviewed about their thoughts on how the error impacted their trust. **Results & Discussion** Measures of trust that attribute human characteristics or descriptors (e.g., genuine, sincere, moral, etc.) to robots were inconsistent with older adults' perceptions of what builds trust in robots. They focused more on robot performance items (e.g., reliable, consistent, predictable, etc.) as appropriate for measuring trust. Participants shared that direct interaction with robots and consistent robot performance were critical for building and maintaining trust. Their perceptions of the impact of errors on trust were mixed, but participants identified the error's consequence and frequency as an important consideration for trusting domestic robots. Overall, we found that there were limitations to the standard trust measures for comprehensively assessing older adults' trust in an assistive robot performing tasks in a home environment. Trust measures should be function- and domain-specific (i.e., measures should offer specific use cases or contexts when asking respondents to assess whether they would trust the robot).

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