

Table S1. The determinants of participants' opinion changes: percentages of participants whose opinions worsened after interaction with the robot

| Area of the questionnaire | <u>Age:</u> <80 years vs. ≥80 years | <u>Gender:</u> females vs. males | <u>Education:</u> primary and below vs. above primary | <u>Ease of use of technolo- gical devices:</u> 1-3 vs. 4-5* | <u>Self- perception of health:</u> 1-3 vs. 4-5* | <u>Self- perception of fitness:</u> 1-3 vs. 4-5* |
|---|--|--|--|--|--|---|
| A: INTERACTION WITH THE ROBOT AND TECHNICAL ISSUES | | | | | | |
| A1 The robot should be a companion of the elderly person | 9.2% vs. 16.7% | 17.2% vs. 6.1% | 10.6% vs. 13.6% | 9.5% vs. 16.3% | 11.8% vs. 13.5% | 14.1% vs. 9.5% |
| A2 The robot should be an assistant of the elderly person | 4.6% vs. 16.7% | 12.5% vs. 6.1% | 10.6% vs. 9.1% | 11.1% vs. 8.2% | 9.2% vs. 10.8% | 11.3% vs. 7.1% |
| A3 The robot should be a useful device of the elderly person (something to be used when needed, with no other interaction) | 7.7% vs. 6.3% | 7.8% vs. 6.1% | 4.3% vs. 9.1% | 3.2% vs. 12.2% | 10.5% vs. 0.0% | 7.0% vs. 7.1% |
| A4 The elderly are prepared to interact with a robot | 20.0% vs. 16.7% | 14.1% vs. 24.5% | 12.8% vs. 22.7% | 14.3% vs. 24.5% | 19.7% vs. 16.2% | 16.9% vs. 21.4% |
| A5 The elderly are able to manage with the robot | 29.2% vs. 31.3% | 26.6% vs. 34.7% | 27.7% vs. 31.8 | 25.4% vs. 36.7% | 30.3% vs. 29.7% | 29.6% vs. 31.0% |
| A6 The elderly want to increase their knowledge about the robots to be able to operate them | 26.2% vs. 20.8% | 23.4% vs. 24.5% | 19.2% vs. 27.3% | 17.5% vs. 32.7% | 23.7% vs. 24.3% | 29.6% vs. 14.3% |
| A7 The robot should instruct the elderly person what to do in case of problems with its operation | 9.2% vs. 16.7% | 10.9% vs. 14.3% | 10.6% vs. 13.6% | 7.9% vs. 16.3% | 10.5% vs. 16.2% | 9.9% vs. 16.7% |
| A8 The robot should be customizable (adjusted to individual user preferences and needs) | 6.2% vs. 6.3% | 7.8% vs. 4.1% | 4.3% vs. 7.6% | 6.4% vs. 6.1% | 6.6% vs. 5.4% | 4.2% vs. 9.5% |
| A9 The elderly should be able to choose the functions of the robot they want to use and disable other ones | 18.5% vs. 8.3% | 10.9% vs. 18.4% | 12.8% vs. 15.2% | 15.9% vs. 12.2% | 18.4% vs. 5.4% | 18.3% vs. 7.1% |
| A10 If the robot has been switched off by the owner, it should reactivate automatically (after a specific period) so that it is not forgotten in off mode | 13.9% vs. 12.5% | 15.6% vs. 10.2% | 6.4% vs. 18.2% | 14.3% vs. 12.2% | 13.2% vs. 13.5% | 12.7% vs. 14.3% |
| B: ASSISTIVE ROLE OF THE ROBOT | | | | | | |
| B1 The robot should increase the safety of the elderly home: e.g. locking doors, detecting leaking gas etc. | 3.1% vs. 6.3% | 6.3% vs. 2.0% | 6.4% vs. 3.0% | 3.2% vs. 6.1% | 4.0% vs. 5.4% | 4.2% vs. 4.8% |
| B2 The robot should help the elderly to preserve their memory function, e.g. by playing memory games with them | 6.2% vs. 18.8% <i>p</i> <0.05 | 14.1% vs. 8.2% | 4.3% vs. 16.7% | 16.7% vs. 14.3% | 11.8% vs. 10.8% | 9.9% vs. 14.3% |
| B3 The robot should encourage and guide the elderly to perform physical exercises | 10.8% vs. 14.6% | 14.1% vs. 10.2% | 4.3% vs. 16.7% | 16.7% vs. 12.2% | 14.5% vs. 8.1% | 12.7% vs. 11.9% |
| B4 The robot should provide advice about a healthy diet | 15.4% vs. 16.7% | 15.6% vs. 16.3% | 17.0% vs. 15.2% | 22.2% vs. 8.2% <i>p</i> <0.05 | 18.4% vs. 10.8% | 14.1% vs. 19.1% |
| B5 The robot should monitor the environment (temperature. humidity) and suggest air conditioning adjustment or windows opening | 6.2% vs. 12.5% | 10.9% vs. 6.1% | 8.5% vs. 9.1% | 9.1% vs. 8.2% | 10.5% vs. 5.4% | 12.7% vs. 2.4% |
| B6 The robot should measure physiological parameters (blood pressure. heart rate. body temperature) of the elderly person | 16.9% vs. 10.4% | 9.4% vs. 20.4% | 14.9% vs. 13.6% | 13.6% vs. 10.2% | 14.5% vs. 13.5% | 14.1% vs. 14.3% |
| B7 The robot should monitor the amount of food and fluid intake of the owner | 20.0% vs. 22.9% | 18.8% vs. 24.5% | 23.4% vs. 19.7% | 19.7% vs. 18.4% | 23.7% vs. 16.2% | 21.1% vs. 21.4% |
| B8 The robot should remind the elderly about appointments | 12.3% vs. 8.3% | 7.8% vs. 14.3% | 17.0% vs. 6.1% | 6.4% vs. 16.3% | 13.2% vs. 5.4% | 8.5% vs. 14.3% |
| B9 The robot should remind the elderly about medication | 7.7% vs. 4.2% | 3.1% vs. 10.2% | 6.4% vs. 6.1% | 6.1% vs. 12.2% | 6.6% vs. 5.4% | 7.0% vs. 4.8% |
| B10 The robot should remind about meals times. drinks | 20.0% vs. 16.7% | 18.8% vs. 18.4% | 10.6% vs. 24.2% | 24.2% vs. 22.5% | 18.4% vs. 18.9% | 18.3% vs. 19.1% |

| | | | | | | |
|---|--------------------|---|--------------------|--------------------|--------------------|--------------------|
| B11 The robot should observe the behaviour of the elderly person to detect falls or changes due to illness | 7.7% vs. 6.3% | 7.8% vs. 6.1% | 10.6% vs. 4.6% | 4.6% vs. 6.1% | 7.9% vs. 5.4% | 5.6% vs. 9.5% |
| B12 The robot should call the centre in case of emergency | 7.7% vs. 2.1% | 1.6% vs. 10.2% | 6.4% vs. 4.6% | 4.6% vs. 8.2% | 6.6% vs. 2.7% | 7.0% vs. 2.4% |
| B13 The robot should help the owner to find lost objects (e.g. glasses, keys) | 4.6% vs. 4.2% | 7.8% vs. 0.0% | 2.1% vs. 6.1% | 3.2% vs. 6.1% | 5.3% vs. 2.7% | 4.2% vs. 4.8% |
| C: SOCIAL ASPECTS OF USING THE ROBOT | | | | | | |
| C1 The robot could decrease the sense of loneliness and improve the mood of the elderly person | 10.8% vs. 16.7% | 15.6% vs. 10.2% | 8.5% vs. 16.7% | 9.5% vs. 18.4% | 14.5% vs. 10.8% | 15.5% vs. 9.5% |
| C2 The robot could encourage the elderly to enhance their contacts with friends | 7.7% vs. 18.8% | 14.1% vs. 10.2% | 6.4% vs. 16.7% | 11.1% vs. 14.3% | 11.8% vs. 13.5% | 12.7% vs. 11.9% |
| C3 The robot should initiate contacts with others (calling friends, initiating skype conversations) | 13.9% vs. 18.8% | 18.8% vs. 12.2% | 10.6% vs. 19.7% | 14.3% vs. 18.4% | 17.1% vs. 13.5% | 18.3% vs. 11.9% |
| C4 The robot should have entertainment functions (e.g. gaming partner, reading aloud or playing music function) | 10.8% vs. 14.6% | 12.5% vs. 12.2% | 10.6% vs. 13.6% | 9.5% vs. 16.3% | 14.5% vs. 8.1% | 14.1% vs. 9.5% |
| C5 The robot should detect the owner's mood (facial expression) | 20.0% vs. 14.6% | 18.8% vs. 16.3% | 19.2% vs. 16.7% | 17.5% vs. 18.4% | 22.4% vs. 8.1% | 19.7% vs. 14.3% |
| C6 The robot should accompany the owner in everyday activities (watching TV, preparing meals) | 23.1% vs. 25.0% | 29.7% vs. 16.3% | 21.3% vs. 25.8% | 27.0% vs. 20.4% | 26.3% vs. 18.9% | 23.9% vs. 23.8% |
| D: ETHICAL ISSUES | | | | | | |
| D1 The elderly person should have control over the robot | 18.5% vs. 20.8% | 18.8% vs. 20.4% | 17.0% vs. 21.2% | 17.5% vs. 22.5% | 23.7% vs. 10.8% | 19.7% vs. 19.1% |
| D2 The elderly person should be able to send the robot to its place/docking station and keep it staying there | 21.5% vs. 12.5% | 12.5% vs. 24.5% | 21.3% vs. 15.2% | 19.1% vs. 16.3% | 17.1% vs. 18.9% | 18.3% vs. 16.7% |
| D3 It is acceptable that the robot informs a family member or caregiver about the older person's behaviour/health problems | 7.7% vs. 8.3% | 6.3% vs. 10.2% | 6.4% vs. 9.1% | 9.5% vs. 6.1% | 10.5% vs. 2.7% | 9.9% vs. 4.8% |
| D4 The elderly person should be able to switch off the robot in specific situations (friends' visits, privacy reasons etc.) | 13.9% vs. 16.7% | 10.9% vs. 20.4% | 12.8% vs. 16.7% | 14.3% vs. 16.3% | 14.5% vs. 16.2% | 16.9% vs. 11.9% |
| D5 It is acceptable that the robot will have much information about the user (social, medical, others) | 18.5% vs. 8.3% | 7.8% vs. 22.5% <i>p</i> <0.05 | 8.5% vs. 18.2% | 14.3% vs. 14.3% | 18.4% vs. 5.4% | 12.7% vs. 16.7% |

* *Ease of use of technological devices, Self-perception of health and Self-perception of fitness* were rated on a 5-point scale: from 1 (worst) via 3 (neutral) to 5 (best).

Table S2. Percentages of participants whose opinions worsened after interaction with the robot in relation to the scores of Mini Mental State Examination (MMSE) and Barthel Index

| Area of the questionnaire | MMSE: 15-19 points vs. ≥20points | Barthel Index: <80 points vs. ≥85 points |
|---|--|--|
| A: INTERACTION WITH THE ROBOT AND TECHNICAL ISSUES | | |
| A1 The robot should be a companion of the elderly person | 18.2% vs. 10.3% | 13.3% vs. 10.7% |
| A2 The robot should be an assistant of the elderly person | 18.2% vs. 7.7% | 8.9% vs. 10.7% |
| A3 The robot should be a useful device of the elderly person (something to be used when needed, with no other interaction) | 4.6% vs. 7.7% | 2.2% vs. 10.7% |
| A4 The elderly are prepared to interact with a robot | 18.2% vs. 18.0% | 17.8% vs. 17.9% |
| A5 The elderly are able to manage with the robot | 40.9% vs. 25.6% | 35.6% vs. 25.0% |
| A6 The elderly want to increase their knowledge about the robots to be able to operate them | 22.7%vs. 24.4% | 24.4% vs. 23.2% |
| A7 The robot should instruct the elderly person what to do in case of problems with its operation | 0.0% vs. 14.1% | 11.1% vs. 12.5% |
| A8 The robot should be customizable (adjusted to individual user preferences and needs) | 4.6% vs. 6.4% | 6.7% vs. 5.4% |
| A9 The elderly should be able to choose the functions of the robot they want to use and disable other ones | 0.0% vs. 14.1% | 13.3% vs. 8.9% |
| A10 If the robot has been switched off by the owner, it should reactivate automatically (after a specific period) so that it is not forgotten in off mode | 4.6% vs. 16.7% | 13.3% vs. 14.3% |
| B: ASSISTIVE ROLE OF THE ROBOT | | |
| B1 The robot should increase the safety of the elderly home: e.g. locking doors, detecting leaking gas etc. | 4.6% vs. 3.9% | 4.4% vs. 3.6% |
| B2 The robot should help the elderly to preserve their memory function, e.g. by playing memory games with them | 13.6% vs. 9.0% | 2.2% vs. 16.1% <i>p<0.05</i> |
| B3 The robot should encourage and guide the elderly to perform physical exercises | 18.2% vs. 9.0% | 6.7% vs. 16.1% |
| B4 The robot should provide advice about a healthy diet | 18.2% vs. 15.4% | 8.9% vs. 21.4% |
| B5 The robot should monitor the environment (temperature. humidity) and suggest air conditioning adjustment or windows opening | 13.6% vs. 6.4% | 4.4% vs. 10.7% |
| B6 The robot should measure physiological parameters (blood pressure. heart rate. body temperature) of the elderly person | 18.2% vs. 14.1% | 13.3% vs. 16.1% |
| B7 The robot should monitor the amount of food and fluid intake of the owner | 22.7% vs. 23.1% | 20.0% vs. 25.0% |
| B8 The robot should remind the elderly about appointments | 18.2% vs. 10.3% | 8.9% vs. 14.3% |
| B9 The robot should remind the elderly about medication | 4.6% vs. 7.7% | 4.4% vs. 8.9% |
| B10 The robot should remind about meals times. drinks | 22.7% vs. 19.2% | 15.6% vs. 23.2% |
| B11 The robot should observe the behaviour of the elderly person to detect falls or changes due to illness | 13.6% vs. 5.1% | 8.9% vs. 5.4% |
| B12 The robot should call the centre in case of emergency | 4.6% vs. 5.1% | 6.7% vs. 3.6% |
| B13 The robot should help the owner to find lost objects (e.g. glasses, keys) | 0.0% vs. 5.1% | 4.4% vs. 3.6% |

| C: SOCIAL ASPECTS OF USING THE ROBOT | | |
|---|--------------------|--------------------|
| C1 The robot could decrease the sense of loneliness and improve the mood of the elderly person | 13.6% vs. 11.5% | 11.1% vs. 12.5% |
| C2 The robot could encourage the elderly to enhance their contacts with friends | 13.6% vs. 12.8% | 11.1% vs. 16.1% |
| C3 The robot should initiate contacts with others (calling friends, initiating skype conversations) | 18.2% vs. 14.1% | 11.1% vs. 17.9% |
| C4 The robot should have entertainment functions (e.g. gaming partner, reading aloud or playing music function) | 13.6% vs. 11.5% | 8.9% vs. 14.3% |
| C5 The robot should detect the owner's mood (facial expression) | 18.2% vs. 18.0% | 17.8% vs. 17.9% |
| C6 The robot should accompany the owner in everyday activities (watching TV, preparing meals) | 9.1% vs. 25.6% | 17.8% vs. 25.0% |
| D: ETHICAL ISSUES | | |
| D1 The elderly person should have control over the robot | 22.7% vs. 14.1% | 17.8% vs. 16.1% |
| D2 The elderly person should be able to send the robot to its place/docking station and keep it staying there | 27.3% vs. 14.1% | 13.3% vs. 19.6% |
| D3 It is acceptable that the robot informs a family member or caregiver about the older person's behaviour/health problems | 4.6% vs. 9.0% | 15.6% vs. 3.6% |
| D4 The elderly person should be able to switch off the robot in specific situations (friends' visits, privacy reasons etc.) | 22.7% vs. 12.8% | 15.6% vs. 14.3% |
| D5 It is acceptable that the robot will have much information about the user (social, medical, others) | 18.2% vs. 14.1% | 11.1% vs. 19.6% |