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Keywords: survey, design, evaluation, assistive robots, likeability, tasks, age, gender, experience

Motivation & objective

- the appearance of the robot influences the acceptance
→ *first impression*
- the hardware must be suitable for the task
→ *form follows function*
- the tasks and the design must fit together
→ *match-hypothesis*

Method

- quantitative data collection:
→ *two field surveys over 2 years*
- Pinakothek der Moderne, Munich Exhibition: "KI.ROBOTIK.DESIGN" 09/2021 – 09/2022
 - Deutsches Museum, Munich Exhibition: "Robotik" 02/2022 – 03/2023

Research questions

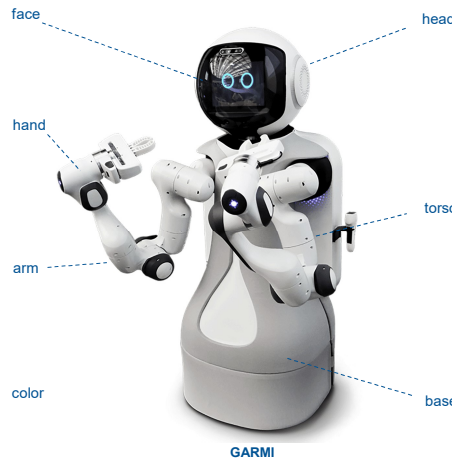
- How do participants rate the design of GARMI as a whole and of his individual body parts?
- Do the independent variables of age, gender, experience in care and robotics play a role in the assessment?
- For which tasks and in which areas of use would they accept support from GARMI?
- What acceptance levels do similar example robot systems achieve?

1. Survey

- GARMI**
- participants:** N = 250 (66.7 % female, 33.3 % male, 0.0 % divers)
- age:** M (SD) = 36.65 (20.17)
- min./max.:** 8 – 90 years
- version:** 1 questionnaire à 1 robot

- Legende tasks:**
- serve:** transport, opening of doors, help in household, pick up
 - needs:** food & drinks, hygiene, dressing, massage
 - mobility:** help with get up, bed and wheelchair transfer
 - multimedia:** video telephony, alarm function, entertainment, internet, games, music, reminder

- Legende areas of use:**
- hospital:** short-term care/ public space/ independent of age
 - nursing home:** long-term care/ public space/ dependent of age → elderly
 - at home:** long-term care/ private room/ independent of age
 - own person:** ready to use

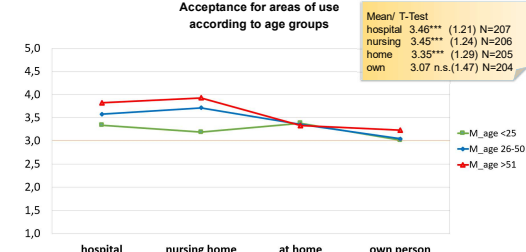
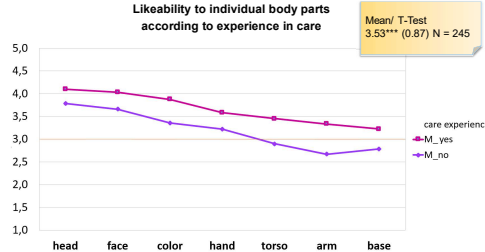
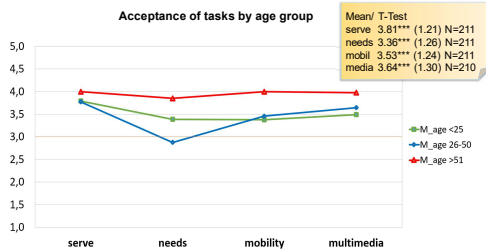


Results

- Likeability**
- no significant differences according to age, gender and experience in robotics
 - differs significantly by care experience
 - the values are average to slightly positive
 - participants with care experience consistently rate GARMI higher, with the best scores achieved by head, face and color

- Tasks**
- the acceptance of the tasks depends on the age
 - the values are average to slightly positive
 - older people over 51 would most likely use robot GARMI

- Areas of use**
- the highest acceptance has the use in nursing homes and hospitals
 - the values are average to slightly positive
 - older people over 51 would most likely use GARMI



2. Survey

- Robot design/ 500 robots**
- participants:** N = 2712 (51.9 % female, 47.3 % male, 0.9 % divers)
- age:** M (SD) = 28.51 (18.51)
- min./max.:** 3 – 96 years
- version:** 10 questionnaires à 50 robots

- Legende acceptance:** 5-Likert-scale, scale center 3
- Value interpretation:**
- | | | | | |
|------------|-------------------|---------|------|-----------------|
| [1.0; 1.8] | negative | p<0.001 | *** | high |
| [1.8; 2.6] | slightly negative | p<0.01 | ** | middle |
| [2.6; 3.4] | average | p<0.5 | * | low |
| [3.4; 4.2] | slightly positive | p>0.5 | n.s. | not significant |
| [4.2; 5.0] | positive | | | |



Results

- Likeability**
- differs significantly by age
 - the values are slightly negative to average
 - the highest likeability is among young people up to 25, the lowest among older people over 51 (with exception of Tiago)

- Tasks**
- the highest acceptance reaches task serve, the lowest task mobility
 - the values are slightly negative to average
 - HSR, Care-O-Bot 4 and GARMI reach the best results

