



HELP? Attitudes Towards Care and Assistive Technologies from the Perspective of People with Disabilities

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Abstract. Increasing care needs represent major challenges for today's care sectors. Developing assistive technologies such as Ambient Assisted Living (AAL) systems pose a potential approach to face these challenges by relieving care staff or facilitating everyday life, e.g., for people with disabilities. Thereby, acceptance is essential for a sustainable adoption of assistive technologies in real life. So far, research has focused on technology-related as well as demographic factors and persons' attitudes (e.g., technical self-efficacy) impacting technology acceptance. In contrast, individual attitudes towards the own situation - in particular individual attitudes towards care - have not been considered as potential influencing factors on the acceptance of assistive technologies. In order to create an appropriate measuring instrument for attitudes towards care, two empirical studies were carried out: In an online survey study ($n = 34$) persons' attitudes towards the own care situation and their relationships to attitudes towards usage of assistive technologies were studied out of the perspective of people with disabilities. The exploratory confirmed instrument "attitudes towards care" was related with acceptance and perception of assistive technologies focusing on people of different ages with physical disabilities. Results of the second study ($n = 64$) verified these relationships focusing on elderly people in need of care. This suggests that attitudes towards care are acceptance-relevant for diverse groups of people. The results can be used to investigate relationships between individual perceptions of care and (assistive) technology acceptance in detail and to refine and adapt the attitude towards care instrument for diverse user groups.

Keywords: Assistive technologies · Technology acceptance
Attitude towards care · People with disabilities

1 Introduction

Rising needs of care are omnipresent but also divergent challenges for today's society. On the one hand, in the context of demographic change, a steadily increasing number of older people in need of care pose strains for the care sectors [1, 2]. On the other hand, age-independent disabilities of people cause huge needs of care and assistance as well [3].

Independent from age, most people in need of care desire to live at their own home as long and as autonomously as possible [4, 5]. Assistive technologies such as Ambient Assisted Living (AAL) technologies and systems have the potential to enable and support a more autonomous and independent life within the own home environment for diverse user groups, e.g., by monitoring of vital parameters, detecting falls, or facilitating life using smart home elements [6–8]. To realize assistive technologies that satisfy the requirements of diverse user groups, it is necessary to analyze whether and to which extent such technologies or systems are accepted and if those evaluations depend on the diversity of potential users. So far, there have been several studies investigating the acceptance of AAL and smart home technologies focusing on influencing demographic factors such as age (e.g., [9, 10]) or gender [11]. In current studies, the perspectives of people with disabilities, especially their wishes and needs, are increasingly involved [5, 12]. In contrast, individual care-related attitudes have not been considered as influencing factors for the acceptance of assistive technologies - in particular not from the perspective of people with disabilities.

2 State of the Art

Numerous studies explored the technical development of assistive technologies and systems, their efficiency, functionalities, and reliability [e.g., 6, 7]. Considering professional care contexts, previous research activities were predominantly reduced on efficiency in care [13], patient satisfaction with care [14], and reduction of costs [15] and focused not on perceptions of diverse groups of people referring to their own care situation.

In recent years, the acceptance of diverse assistive technologies was increasingly investigated focusing on influencing user diversity factors such as age or gender [10, 11]. In this regard, current research also considered experience with care as user diversity factor [5] revealing that people with diverse care experiences (care professionals, people with disabilities, relatives of people in need of care, not-experienced people) differ with regard to their perception and acceptance of assistive technologies. These results indicate that in particular individual attitudes towards the own situation referring to disabilities and care needs are decisive for technology acceptance. Referring to people with disabilities, some studies focus on attitudes of people towards people with disabilities [e.g., 16] as well as on the subjective perception of the own disability or rather coping with disabilities [17, 18]. In contrast, feelings and perceptions of people during care, their wishes and needs – in sum their subjective perception of care situations and their attitudes towards their care – have been neglected so far in particular with regard to their potential impact on technology acceptance.

Therefore, the current study aimed for an investigation of people with disabilities' individual perception of their care situation and possible relationships to the perception of assistive technologies.

3 Methodology

Based on preceding qualitative studies, the current study focused on people with disabilities ($n = 34$) of different ages aiming for an investigation of their attitude towards their disability, in particular their attitude towards care, and their acceptance of assistive technologies. The exploratory study was directed to the development of an instrument that is able to reliably measure “attitude towards care” as potential influencing factor for the acceptance of assistive technologies. In a first step, this instrument is analyzed focusing on the perspective of people with disabilities. In a second step, it has to be examined if this instrument is basically adaptable to evaluating attitudes towards care of other groups of people in need of care.

As an example for assistive technologies, a holistic AAL system equipped with diverse technologies (e.g., camera, motion detectors, ultrasonic whistles) was evaluated in a scenario-based online questionnaire. All items and constructs based on the findings of preceding qualitative studies.

3.1 Sample

The mean age of the participants was 41.3 years ($SD = 13.8$, $min = 21$, $max = 81$) with 58.8% females and 41.2% males. All participants indicated to be physically disabled and in need of care, while paralysis, spasticity, and muscular disorders were the most frequently mentioned disabilities. More than half of the participants (55.9%) stated to be disabled by birth, while the other participants (44.1%) stated to live with their disability for more than ten years. The majority of participants indicated to be assisted by their families or partners in combination with professional care staff ($n = 15$) or solely by their families or partners ($n = 12$), whereas few participants were assisted only by professional care staff ($n = 3$). Most of the participants ($n = 23$) reported to need assistance in the areas body care, mobility, housekeeping, and nutrition, while only two participants indicated to need assistance in two of these areas ($n = 9$ in three of these areas). On average, the participants reported a high daily duration of care ($M = 8.8$ h, $SD = 8.3$, $min = 1$, $max = 24$).

4 Results

The participants had on average a rather positive attitude towards their disability indicated by rejecting the most negative statements (e.g., helpless, restricting, annoying) and approving most of the positive statements (Fig. 1). Merely, the positive statements “I am very independent with my disability” ($M = 3.1$; $SD = 1.5$) and “... I can certain things better than people without disabilities” ($M = 2.9$; $SD = 1.5$) were slightly rejected.

Figure 2 shows the participants’ ratings referring to their attitude towards care: the participants agreed with the statements that they are glad to have “... someone who helps me” ($M = 5.3$; $SD = 1.1$) and that the relationship to their care staff is important to them ($M = 5.0$; $SD = 1.5$). Further, the agreement of statements dealing with independency and the approval of the statement “I often feel dependent during my

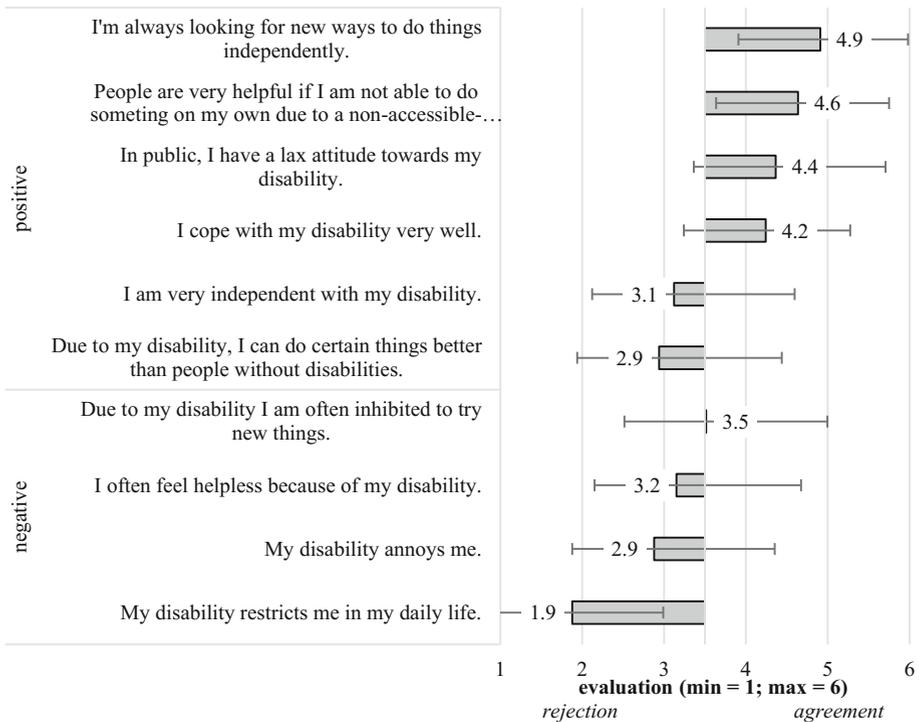


Fig. 1. Evaluation of the participants’ attitude towards their disability (Cronbach’s $\alpha = .720$; whiskers indicate standard deviations)

care” (M = 4.4; SD = 1.2) showed that this aspect was of major importance within the attitude towards care.

Using correlation analyses, potential relationships between attitudes towards disabilities and care and acceptance of assistive technologies were investigated in an explorative way. Interestingly, none of the demographic user factors (age, gender, education) was related with the acceptance of assistive technologies.

In addition, the attitude towards disabilities was also not related with acceptance of AAL technologies. Apparently, the positive or negative evaluation of assistive technologies at home is not depending on the disability status of persons. Instead, the attitude towards care correlated with the perception of benefits ($r = .420$; $p < .05$) as well as the acceptance of assistive technologies ($r = .401$; $p < .05$). Thus people with a more positive attitude towards care including high needs for independency perceived potential benefits of assistive technologies more positive and showed a higher acceptance of those technologies.

Based on these results, the developed construct attitude towards care was also evaluated in a second quantitative study focusing on older people in need of care ($n = 64$) and their acceptance of assistive medical technologies. The results corroborated (Cronbach’s $\alpha = .710$) that the measurement instrument and the developed construct was able to assess the attitude towards care also for a different user

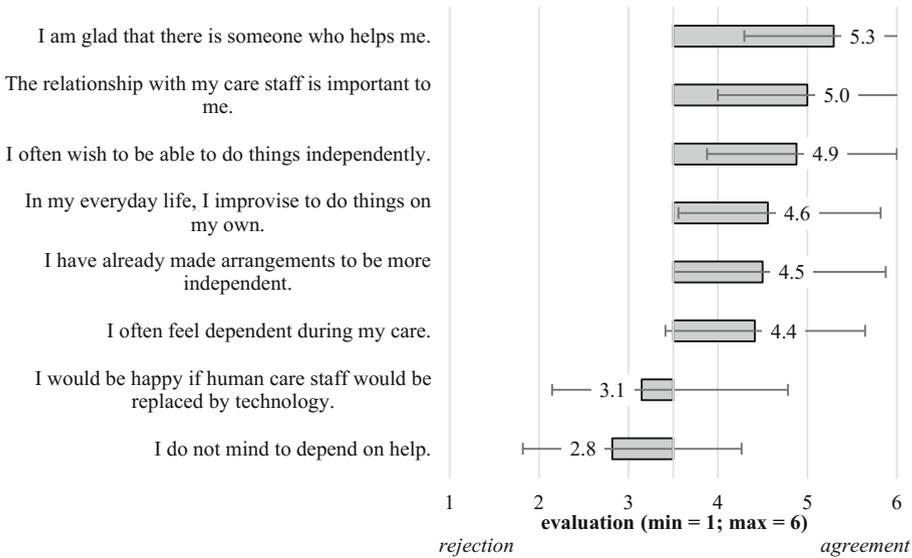


Fig. 2. Evaluation of the participants’ attitude towards care (Cronbach’s $\alpha = .620$; whiskers indicate standard deviations).

group. Again, the results showed relationships between the attitude towards care and the perception of benefits ($r = .694$; $p < .01$) as well as the acceptance of assistive technologies ($r = .309$; $p < .05$).

5 Discussion

In contrast to previous studies in the field [e.g., 5, 11], the presented study focused on individual attitudes towards own disabilities and care situations as potential influencing factors on assistive technologies’ acceptance instead of considering demographic factors (e.g., age, gender, education, or “health” status).

The analyses revealed that both applied instruments (attitude towards disability and attitude towards care) could be reasonably used to measure attitudes of people with disabilities. In a first step, the results showed no significant relationships between the attitude towards disability and acceptance of assistive technologies. In contrast, the perception of the own care situation and associated feelings play a decisive role for the acceptance of innovative assistive technologies. These results indicate that the perception and the personal coping with the own situation needing care and support are more decisive for the acceptance of assistive technologies than the general attitude towards the own disability.

In the absence of scales or instruments for assessing the individual attitude towards care, the current study provides a first version of a measuring instrument - in this case - the attitude towards care from the perspective of people with disabilities including aspects such as independency, autonomy, and the relationship to care staff. Further, the

results showed that people with a positive attitude towards care (including high needs and efforts for independency) have a more positive attitude towards assistive technologies. The vivid feedback of our participants showed that they desire technologies that help them to help themselves aiming not for a substitution of human caregivers but enabling themselves to have a more autonomous and self-determined life. Comparative results in a second study implicate, on the one hand, that the instrument assessing attitudes towards care is reasonably usable for diverse user groups and that, on the other hand, attitude towards care is an influencing factor on the acceptance of assistive technologies independent of the type of “users”. As the current study was a first explorative study in this specific regard, future studies will have to investigate the relationship between attitude towards care and acceptance of assistive technologies in more detail as well as focus on potential influences of other user factors (e.g., knowledge about assistive technologies).

6 Conclusion and Future Work

The study represented a first approach to assess people’s attitudes towards care serving as a basis for an extension of the applied instrument and deeper investigations in the future. The relationship between attitudes towards care and the acceptance of different assistive technologies should also be analyzed in more detail focusing on diverse technologies and user groups applying inference statistical analyses to examine group differences and cause-effect relationships.

The first explorative results of the presented study could be used to extend and refine the developed attitude towards care-instrument and to adapt it to different user groups. As the mentioned results of a second study showed, the instrument could be reasonably used for people with disabilities but also for older people in need of care. Thus, in future studies we will investigate to what extent the instrument and its adaptations could also be used to assess hypothetical attitudes towards care (e.g., needs, wishes, concepts of aging and care) for participants who are not (yet) in need of care.

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