IMAGES OF AGEING IN THE AUSTRIAN AAL CONTEXT
Project overview and main results

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Background

Age stereotypes have wide-reaching consequences in terms of health and well-being of older people. According to **age stereotype embodiment theory**, age stereotypes are internalized and become self-relevant (self-stereotypes; Levy, 2009). Negative age self-stereotypes reduce life expectancy by 7.5 years (Levy, 2009). Technology development needs to be guided by differentiated age stereotypes taking into account developmental losses as well as benefits and hence creating contexts for individual developmental regulation. The **life-span model of selective optimization with compensation (SOC)** provides a useful theoretical basis for developing and evaluating gero-technology and avoiding the creation of new dependencies and loss of capacities due to disuse (Lindenberger, 2007; Lang et al., 2011).
Therefore, benefit studies and projects as well as AAL projects with an Austrian lead were analyzed in the present project in terms of **underlying age stereotypes** using **qualitative and quantitative methods**.

Study 1: Age stereotypes represented in project documents

Objectives:

a) Under-/over-representation of certain groups and supposed needs?
b) Characteristics used to describe typical users in use cases and personas?
c) Technology development focusing compensation of age-related losses vs. optimization (SOC)?
d) Linguistic representation of older people?

Material:

In sum, 128 benefit studies/projects and AAL projects with an Austrian lead could be identified, of which 93 were dedicated to the development and/or testing of technological solutions.

Sample:

Due to the variance of available project documents (ranging from abstracts and other short information only to detailed reports and publications) and the heterogeneity of the project documents, the number of projects and documents analyzed differs for each research question: a) *n* = 91 projects; b) *n* = 40 projects, c) *n* = 58 projects, 1.999 pages, d) *n* = 58 projects, 46,541 words.

Methods data analysis:

a) Targets groups: qualitative content analysis, inductive procedures (Mayring, 2014); Technical solutions: classified using TAALXONOMY (Leitner et al., 2015)
b) Quantitative and qualitative content analysis
c) Qualitative content analysis, deductive main categories (SOC, Lang et al., 2011), inductive sub-categories each.
d) Linguistic inquiry and word count (LIWC2015, Pennebaker et al. 2015)

Intercoder/Interrater reliability: Cohen's κ = .808 – 1.000

Table 2. Average Percent per LIWC category

LIWC category	M(SD)
Positive emotions (e.g., happiness)	3.32 (3.51)
Negative emotions (e.g., fearful)	1.08 (2.21)
Health (e.g., diabetes, medication)	4.00 (4.38)
Leisure (e.g., vacation)	1.01 (2.13)
Optimism (e.g., success)	0.99 (1.83)
Risks (e.g., dangerous, avoid)	0.71 (1.71)
Female references (e.g., woman)	0.39 (1.23)
Male references (e.g. male)	0.25 (1.04)

Main results:

a) Target groups: older people in general & community dwelling older people (44%), older people with care needs (including caregivers, 13.2%), older people with specific disabilities and diseases (36.3%), formal and informal caregivers (3.3%), older people in the workplace (3.3%).

Top three TAALXONOMY categories: T08 (67.0%), T06 (61.5%), and T01 (50.5%); least frequent: T04 (16.5%), T05 (7.7%).

b) Characteristics used to describe users in personas/scenarios: technology use (97.5%), social contacts (90%), living situation (82.5%), hobbies/activities (82.5%), physical health (77.5%), cognition (60%), finances (32.5%). Users were described as dynamic and actively shaping their development in 22.5% of personas/scenarios.

c) Table 1 illustrates the results of analyzing the projects based on the SOC model.

d) Table 2 shows the results of the linguistic analysis.

Table 1. Frequencies of inductive sub-categories on the focus of technology development based on the SOC model

Contexts for loss-based selection and compensation (LC)		Contexts for elective selection and optimization (EO)	
Focus on developmental losses		Focus on developmental gains	
Example: "*Since forgetfulness is the most common reason for non-concordance, the elderly have to be supported both technical and cognitive (sic). The application of … (ICT) through a mobile phone … is reasonable for reminding the patient at the proper time to take the right medication.*" *(P60, d1, p.157)*		Example: "*The elder person can record, import (…) and follow tracks on his Smart Phone application and view his recorded track either directly on his mobile device or on his TV. . . . He [the user] is able to view his progress.*" (P95, d4, pp. 35-36)	
subcategories			
LC1: Monitoring for external control	50.0%	EO1: Simplified access to information/entertainment	17.2%
LC2: Compensation of health limitations	36.2%	EO2: Selection of social contacts and communication	5.2%
LC3: Automatic solutions for health and comfort	17.2%	EO3: Self-monitoring	19.0%
LC4: Information and communication loss-based	43.1%	EO4: Learning and training	31.0%

Note: More than one category could be assigned per project. LC: 53% of projects, EO: 21% of projects, both: 26% of projects

Study 2: Vignette experiment – age stereotypes elicited in users

Objectives:

Effects of use cases with technical solutions in the sense of compensation (emergency alert) vs. optimization (training) on aging (self-) stereotypes of potential users

Sample:

N = 213 older people (mean age: 74.6 ± 5.56 years) and students (mean age: 34.3 ± 12.80 years)

Design and methods of data collection:

See figure 1.

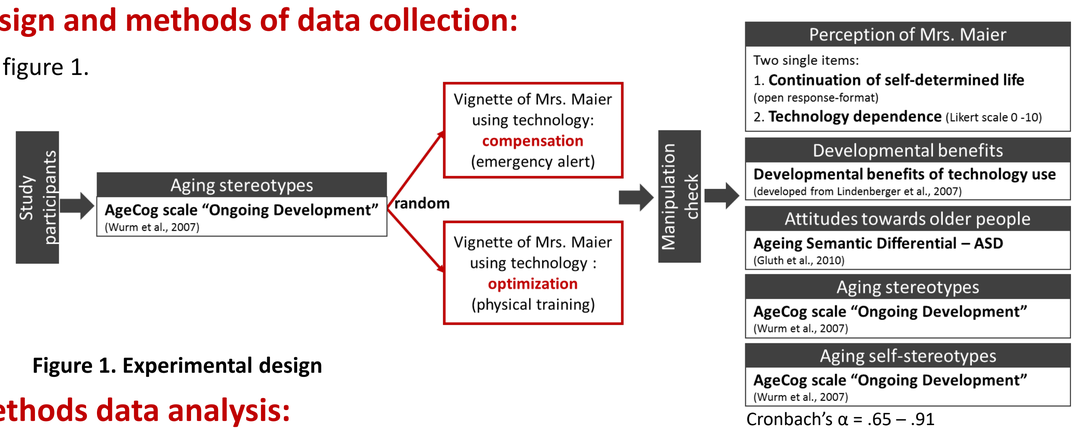

Figure 1. Experimental design

Cronbach's α = .65 – .91

Methods data analysis:

Repeated measures ANOVA, independent sample t-tests

Main results:

Effects were mixed and rather small. Independent of the experimental condition a negative effect on the perceptions of ongoing development in old age was detected, especially in the group of older people (fig. 2). In the optimization condition the duration of Mrs. Maier continuing a self-determined life was rated 1.6 years longer, t(205) = -3.735, *p* < .001.
Marginally significant differences could be detected for two of the four ASD scales, namely "instrumentality", t(211) = 1.757, *p* = .080, and "autonomy", t(211) = 1.733, p = .085.
There was no significant effect on aging self-stereotypes.

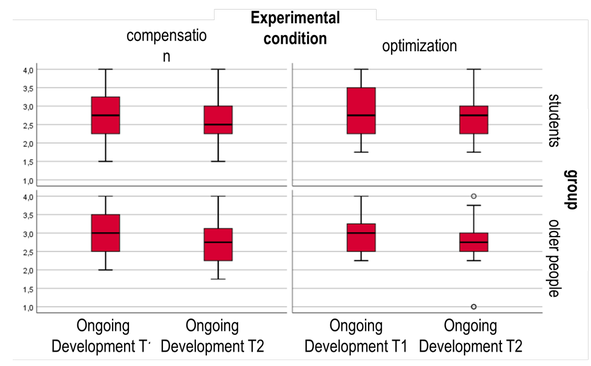

Figure 2. Changes in AgeCog Ongoing Development
Main effect time: F(1, 209) = 16.831, p < .001
Interaction group*time: F(1, 209) = 4.096, *p* = .044

Study 3: Age stereotypes in project team members

Objectives:

Exploration of a) experiences with and participation of project team members from different disciplines in Austrian benefit and AAL projects, and b) of their views on aging (age stereotypes and future self-views).

Sample:

N = 53 Austrian project team members from technical and non-technical disciplines

Methods of data collection:

Cross-sectional online-survey
a) Project related aspects: e.g., perceived participation, interdisciplinary cooperation, integration and application of gerontological knowledge, user participation (Cronbach's α = .63 – .86).
b) Aging (self-)stereotypes: Ageing related cognitions (AgeCog scales, Wurm et al., 2007), domain-specific age stereotypes (Kornadt et al., 2018; Kamin & Lang, 2013), Cronbach's α = .74 – .88

Methods data analysis:

Descriptive analysis, dependent sample t-tests

Main results:

In most projects several methods of user integration are used, especially usability tests (83%). Interdisciplinary cooperation is perceived positively (*M* = 3.64 ± .052 on a 4-point scale).
Integration/application of gerontological knowledge reported less frequently (*M* = 2.34 ± .079 on a 4-point scale).
Respondents reported positive age stereotypes, with the lowest ratings for the technology domain (fig. 3).
Respondents rated themselves in old age more positively than older people in general (fig. 3).

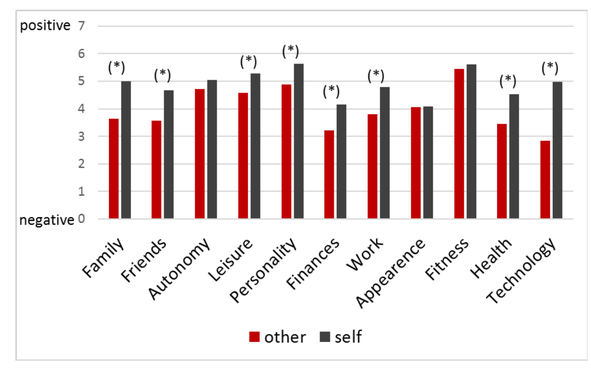

Figure 3. Domain-specific age (self-)stereotypes
(*) indicates significant differences between stereotype and self-view

Discussion

The triangulation and integration of the results of the three studies showed that indeed positive developments have taken place, e.g. technology development considering the potentials of aging and hence creating contexts for elective selection and optimization, representation of positive aspects of ageing in the documents and the endorsement of user involvement and interdisciplinary cooperation by Austrian project team members. At the same time, the comprehensive analysis also points up to possibilities to enhance the Austrian AAL landscape.

E.g., (health) deficits and their compensation were often prioritized and gerontological knowledge and theories not yet integrated sufficiently.
Limitations: Heterogeneity of information and documents (even within same document categories) per project may have led to bias in study 1, study 2 can be criticized for the low statistical power, the sample in study 3 is likely to be biased in favor of AAL community members with rather positive age views.

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