

# The age gradient in technology acceptance – Fact or fiction?

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# Research question

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- Objective of GAL: quality of life in the ageing society
  - Independence within one's own residence
  - Development of systems for assisting elderly people, relatives and caregivers, support of care structures
    - Compensation of age-related declines (e.g., hearing, mobility, dual tasks)
    - Treatment and rehabilitation (e.g. telemonitoring, medication)
    - Chronic diseases (e.g., COPD)
    - Prevention (e.g., falls, strain)
    - Comfort and security (e.g., “smart home” technologies, alarms)
    - Communication, productivity, caregiver assistance ...
- Condition (among others): Technology acceptance

# Research question

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- Older people, however,
  - seem not to be interested in technology explicitly designed for “the elderly”
  - have mostly little (if any) experience with newest technologies
  - were sometimes hindered in everyday life by technological innovations (e.g., ticket machines, banking terminals, mobile phones, remote controls)
  - were sometimes disappointed by the user-friendliness of existing technologies, complexity of instruction manuals etc.
- These factors possibly contribute to a low acceptance of new technologies, what in turn hinders successful implementation
- These factors are distributed unequally in society (e.g., related to education, gender, income), so that new technologies may exacerbate already existing inequalities

# Research question

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- Many large scale surveys seem to confirm the assumption of a decline of technology acceptance, in interest in technology, and in technology readiness with increasing age
  - However, evaluation research in the context of AAL-projects, experiences in living labs etc. often report the opposite finding, namely that elderly people are very interested in these technologies and willing to use it
- ⇒ How to explain such an obvious contradiction?
- ⇒ Is there a decline in technology interest and acceptance?

# Research question

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⇒ How to explain such an obvious contradiction?

- Sample selection bias
- Comparability of stimuli (expected utility)
- Spurious correlation, unobserved heterogeneity

⇒ Is there a decline in technology interest and acceptance?  
Secondary analyses of available data:

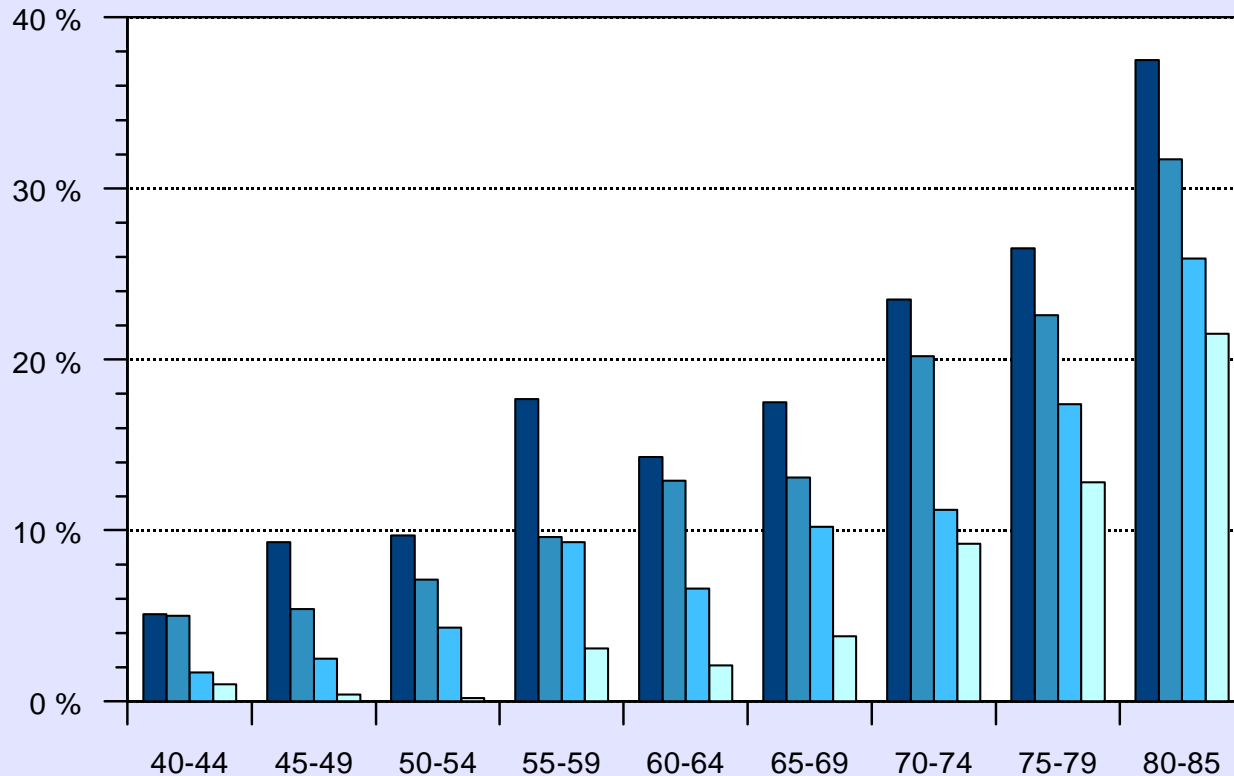
1. Hearing problems and hearing aid usage:

*“German Aging Survey” 2002, BMFSFJ - DZA - infas (n=3.084)*

2. Interest in technology in general:

*“Attitudes of the German population to technology“ 1997, TAB (Office of Technology Assessment at the German Bundestag) - INIFES (n=3.069)*

# Question 1: Technology acceptance by age



- Health problems: Ear complaint or partial deafness
- Do you have difficulties with listening to a group meeting with more than four persons?
- Do you have difficulties with listening, if you make phone calls
- Use one or more of the following tools: Hearing aid

Source: German Aging Survey 2002, ZA 4304, own calculations.

# Question 1: Technology acceptance by age

## Logistic regressions

	Ear complaint	Difficulties in group meetings	Difficulties in phone calls	Hearing aid
Age group (Ref.: 55-69)				
40-54	.52***	.36***	.46***	.29***
70-85	2.11***	2.00***	2.22***	5.51***
Sex: Female	.56***	.54***	.64***	.59***
Region: East Germany	1.00	1.16	.95	1.13
Education (Ref.: Middle):				
Lower	1.07	.96	1.16	1.08
Higher	.94	.76	1.17	.92
Married	.95	.90	1.05	.93
Health (Ref.: Middle)				
Very good	.54**	.37***	.29***	.82
Good	.55***	.54***	.55***	.34***
Bad	1.07	1.23	1.32	1.12
Very bad	1.43	3.24***	2.12***	2.26***
Constant (b)	-1.09***	-1.76***	-1.59***	-2.96***
P <sup>2</sup> (Nagelkerke)	.13	.16	.14	.24
N	2565	2900	2898	2515

German Ageing Survey 2002; odds ratios except for constant; \*: p < .05; \*\*: p < .01; \*\*\*: p < .001.

# Question 1: Technology acceptance by age

## Logistic regressions

	Volunteering		Meeting friends > once a week	
Age group (Ref.: 55-69)				
40-54	1.04	1.03	1.00	.95
70-85	.52***	.50***	.83	.81
Sex: Female	.77**	.76***	1.26***	1.29**
Region: East Germany	.60***	.62***	.58***	.58***
Education (Ref.: Middle):				
Lower	1.25	1.25	1.06	1.12
Higher	1.62***	1.52***	1.08	1.11
Married	1.63***	1.53***	.58***	.56***
Health (Ref.: Middle)				
Very good	1.34	1.31	1.58**	1.59**
Good	.97	.97	1.38***	1.42***
Bad	.52***	.48***	.77	.88
Very bad	.37	.33	.45*	.41*
Difficulties in group meetings	1.25	1.34	.87	.93
Hearing aid usage		1.05		.83
Constant (b)	-1.69***	-1.63***	-.46	-.47
P <sup>2</sup> (Nagelkerke)	.08	.07	.07	.07
N	2898	2511	2880	2494

German Ageing Survey 2002; odds ratios except for constant; \*: p < .05; \*\*: p < .01; \*\*\*: p < .001.

# Question 1: Technology acceptance by age

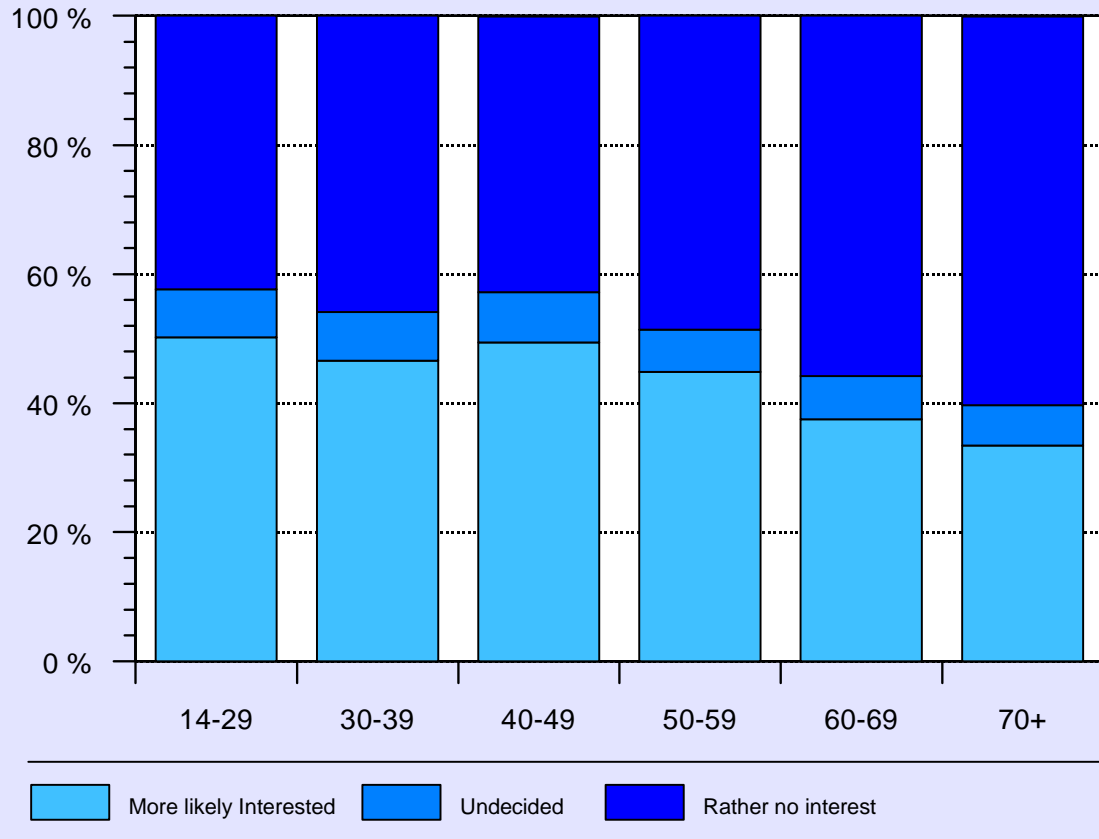
## OLS Regressions

	Life satisfaction		Loneliness	
Age	.21***	.21***	-.02	-.03
Sex: Female	.05**	.05**	-.02	-.02
Region: East Germany	-.06**	-.06**	.01	.01
Education	.02	.02	-.05*	-.05*
Married	.20***	.20***	-.18***	-.18***
Health	-.40***	-.40***	.19***	.19***
Difficulties in group meetings	-.01	.00	-.02	-.02
Hearing aid usage		-.03		-.02
Constant (b)	13.59***	13.27***	1.43***	1.46***
R <sup>2</sup> (corr.)	.21	.21	.07	.07
N	2480	2480	2481	2481

German Ageing Survey 2002; standardized beta (except for constant); \*: p < .05; \*\*: p < .01; \*\*\*: p < .001.

# Question 2: Interest in technology by age

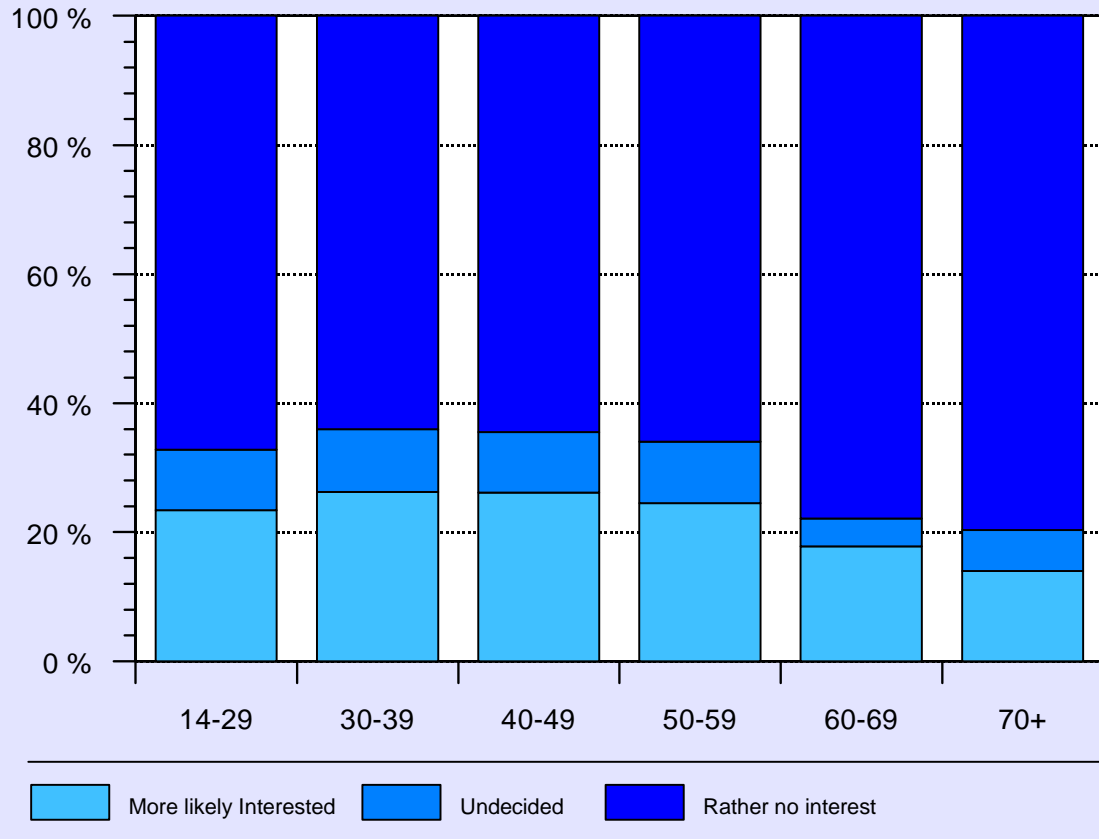
„I am interested in technology and technological issues “



Source: TAB – Die Einstellung der deutschen Bevölkerung zur Technik, ZA 3093, own calculations.

# Question 2: Interest in technology by age

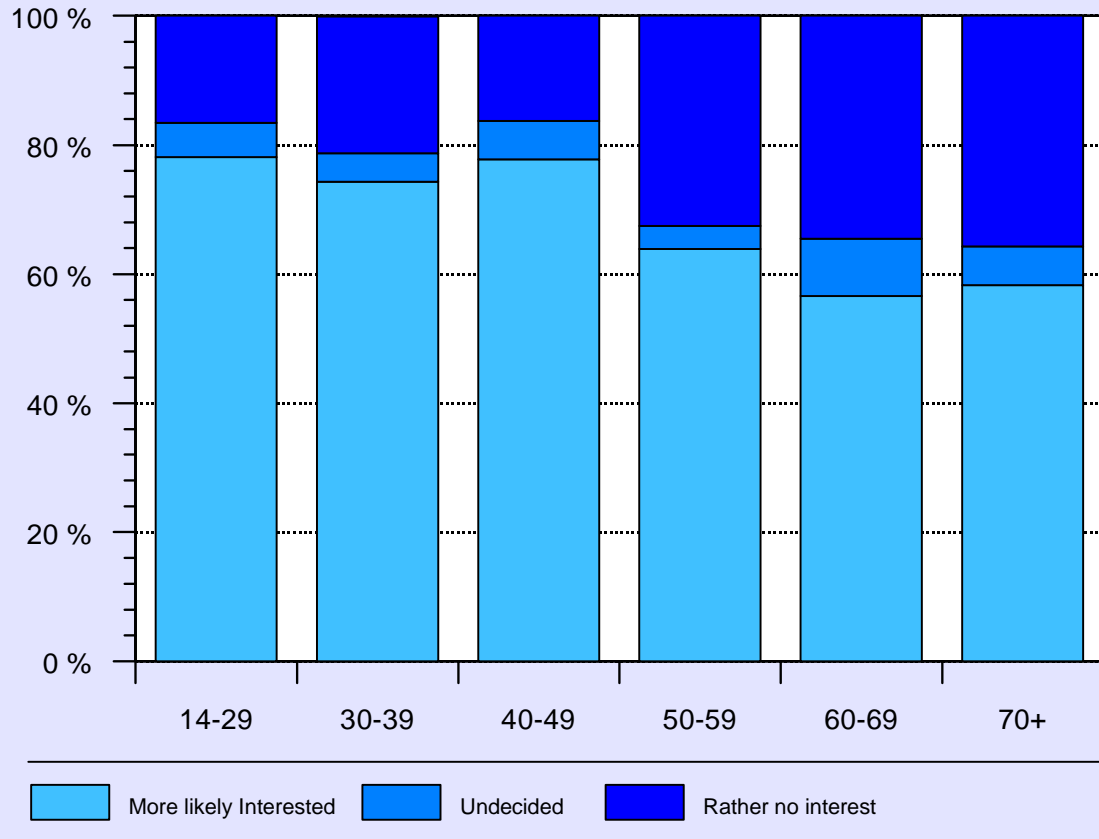
„I am interested in technology and technological issues “: Woman



Source: TAB – Die Einstellung der deutschen Bevölkerung zur Technik, ZA 3093, own calculations.

# Question 2: Interest in technology by age

„I am interested in technology and technological issues “: Men



Source: TAB – Die Einstellung der deutschen Bevölkerung zur Technik, ZA 3093, own calculations.

## Question 2: Interest in technology by age

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### Technology experiences and cohort effects: Education

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Gender (Reference: Men)	7,70***	7,69***
Region East Germany (Reference: West Germany)	0,81**	0,89
Age (Reference: 14-29 years):		
30-39 years	0,96	0,98
40-49 years	0,95	0,91
50-59 years	1,34**	1,23
60-69 years	1,43***	1,18
70 years or more	2,09***	1,69***
Education (Reference: Basic school, no further education completed)		
Basic school, further education/training completed		0,62***
Higher school completed		0,41***
University degree		0,27***
P <sup>2</sup>	.274	.293

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Source: TAB – Die Einstellung der deutschen Bevölkerung zur Technik, ZA 3093, own calculations.

# Conclusions

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- Older people – on average – report less interest in technology. But the explanation has not much to do with age:
  - Composition effect
  - Cohort effects
- Further variance should be explained by variables like technology experience in everyday life or at the workplace etc.
- Disclaimer: Longitudinal data urgently needed
- But in any case it can be concluded, that – as there seems to be no or only a very small age effect – future cohorts of elderly people will react differently



*Contradicting results are most probably also a result of a misinterpretation of quantitative data (spurious correlation)*