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Use of and attitudes towards new technologies of persons 50+ in Austria

SHARE AUSTRIA WORKING PAPER SERIES

by

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Note: This draft working paper is based on preliminary data from the 6th wave of the SHARE survey. Therefore, data is unaudited and preliminary in nature and may change before final publication.

A dynamic new field for health related technologies has emerged over the past decade. Many innovations aim at assisting elderly persons in monitoring and managing their personal health status. Other technologies support these persons in their activities of daily life, and make them feel safe and shepherded while still being able to live on their own. In times of ageing populations and stressed health care systems such technologies provide an interesting alternative to rather classic approaches in health and care services. New technologies become always more accessible to ordinary citizens. In many cases ownership of smartphones or tablets is sufficient for being able to participate in these benefits. But while smartphones and tablets are becoming ever cheaper and technically more sophisticated, attitudes of human beings towards new technologies only slowly change. One major problem is that many older individuals are eager to use new technologies and – especially for persons with disabilities – technologic innovations are becoming ever more relevant in their daily life; however due to age related changes in health and cognitive skills, these people are confronted with an invisible "technological barrier" (see Friesdorf et al., 2000; Czaja and Lee, 2007). This article aims to shed a first light on the mindset of persons 50+ in Austria towards new health and care technologies by looking at the relationship between gender, age, educational background, geographic living area and attitudes towards new technologies.

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DATA

Data for this working paper stem mainly from the 5th and 6th wave of the SHARE survey in Austria. SHARE – the Survey of Health, Ageing and Retirement in Europe – is a multidisciplinary and cross-national panel database of micro data on health, socio-economic status, and social and family networks of approximately 110,000 individuals (more than 220,000 interviews) from 20 European countries and Israel aged 50 or older.

The 6th wave of SHARE took place from January to September 2015. More than 3,500 respondents could be re-interviewed in this longitudinal wave. Additionally, a country-specific paper-and-pencil questionnaire was carried out, covering amongst others two questions focusing on respondents' attitudes towards new technologies. This paper-and-pencil questionnaire was returned by 3,122 Austrian respondents, resulting in a response rate of more than 90%. Of those, 3,079 individuals 50+ answered the questions concerning new technologies. This dataset serves as basis for the present analysis.

SHARE is a panel survey. Sampling errors, non-response, and panel attrition can therefore bias the representativity of the panel. To avoid such problems, data have been weighted with calibrated individual probability weights from the 5th wave of SHARE (see Börsch-Supan and Malter, 2015, pp. 75, for more information on SHARE weights). According to the principles laid out by Haider et al. (2013), analysis beyond descriptive statistics has generally been carried out both in a weighted and unweighted way to control for model-misspecification and possible heteroskedasticity of the independent variables due to unobserved group-level factors.

TABLE 1

Are you prepared to use technical equipment such as computers, smartphones or tablets for any of the following applications?

Respondents 50+ open for applications of computers, smartphones and tablets	
1. Communications means	64%
2. Finding information on the internet	47%
3. Taking photos or looking at them	39%
4. Playing	19%
5. As Medical Alert or Personal Emergency Response System	30%
6. Video calls	15%
7. Memory training	21%
8. As an Auto Fall Alert	21%
9. For monitoring vital functions, or as a health and fitness gadget	12%
10. None of these	27%

Source: SHARE wave 5 paper questionnaire Austria, weighted data, rounded percentages.

WHAT IS THE USE OF SMARTPHONES AND TABLETS?

In a first question we asked respondents 50+ if they were prepared to use new technologies such as computers, smartphones, or tablets. Respondents could choose from 10 different options; multiple choices were allowed. The result is depicted in Table 1.

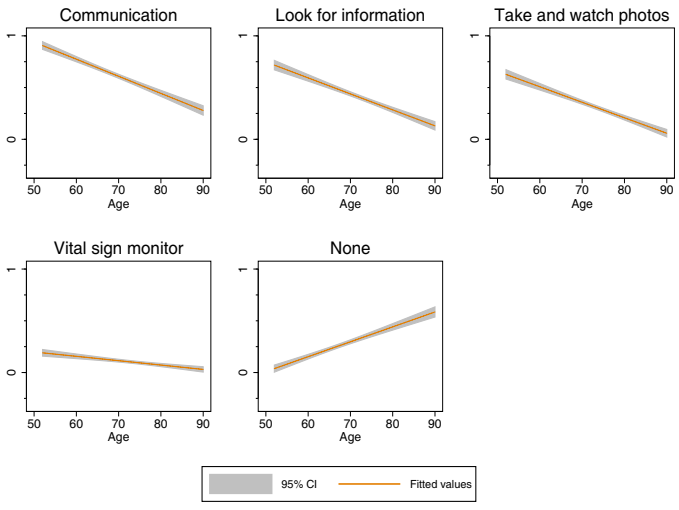
73% of persons 50+ are taking advantage of computers, smartphones or tablets in one way or the other; the remaining 27% can not make any use of new technologies. 64% of all respondents use new technologies for communication purposes. Approximately every second respondent is susceptible towards looking for information on the internet. Almost 40% see a possible use of such devices in taking and watching fotos, and almost every third respondent is prepared to use it as a Personal Emergency Response System. Other possible applications, such as Auto Fall Alerts (21%) or health monitors (12%) do not yet enjoy high levels of acceptance.

Probit regressions based on respondents' stances towards the different technical devices and its applications (see Table 1) with gender and age categories as explanatory variables identify partially significant gender differences and negative age trends. For options one to three – communications means, finding information on the internet, and taking and watching photos – we establish that women are around 7 to 10 percentage points less likely to answer with "Yes" compared to men, holding all other variables constant at their means. A two percentage points smaller marginal effect emerges for "Vital functions monitor and fitness gadget".

CHART 1

Negative age trends in openness towards new technology and its applications for respondents 50+

Respondent shares by age answering with "Yes" (1) or "No" (0)



Predicted values from linear regression of age on options in question 1 with 95% standard error confidence intervals.

Moreover, women are 5 percentage points more likely to answer "None of these" compared to men. Results for the other answer categories are not reported, because statistically significant gender differences could not be established.

Chart 1 presents an overview of the negative age trends for selected outcome variables. In the respective probit regression with option one - communications means - as outcome variable, 60 to 70-year-old persons are 6 percentage points, and 70 to 80-year-old persons are 23 percentage points less likely to say "I am prepared to use new technologies to communicate with other persons" compared to their 50 to 60-year-old counterparts. Moreover, 80 to 90-year-olds are about 50 percentage points, and 90+ year-olds are 64 percentage points less likely than 50 to 60-year-olds to choose this possibility. Quite similar and statistically significant pictures emerged for options 2 (finding information on the internet), 3 (taking and watching photos), 9 (vital function monitor and fitness gadget) and 10, none of these. In other probit regressions the age trend is only partially or not at all statistically significant.

ATTITUDES TOWARDS NEW TECHNOLOGIES

Since tablets and smartphones are not the only technological innovations of the last years, we were interested in a broader picture of general attitudes towards more recent technical innovations. In another question of our paper-and-pencil-questionnaire concerning the use of new

TABLE 2

Share of respondents 50+ with positive or negative attitudes towards specific technical innovations

Share of positive or negative attitudes of respondents 50+ towards technical innovations

	Never heard	Positive	Negative
a. Portable minicomputer (tablet)	13%	42%	43%
b. Phone with internet access (smartphone)	9%	49%	41%
c. Fitness wearable	15%	19%	66%
d. Social media networks e.g. Facebook	11%	23%	65%
e. Computers that can be voice-controlled	16%	24%	60%
f. Emergency tracking & response device	14%	51%	34%
g. Auto Fall Alert	11%	56%	32%
h. Personal Emergency Response System	8%	64%	27%
i. Stove emergency power-down	17%	43%	40%
j. Body fat monitors	14%	18%	68%
k. ELGA - Electronic health record	11%	46%	42%

Source: SHARE wave 5 paper questionnaire Austria, weighted data, rounded percentages. Missing percentages are invalid answers.

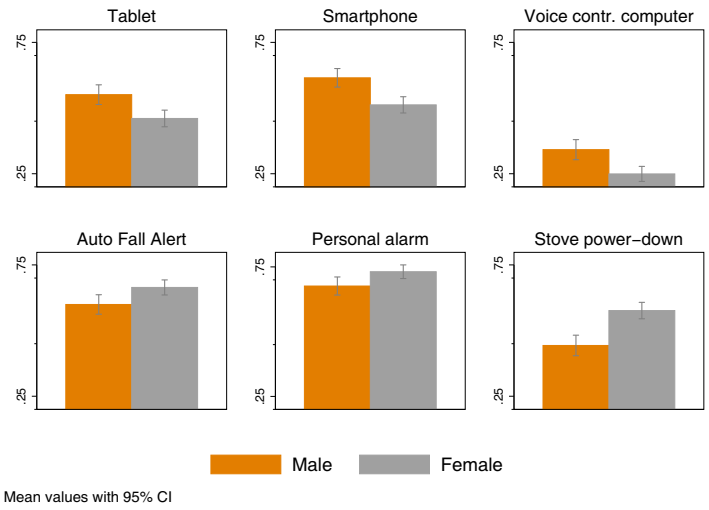
technologies we specifically addressed technical innovations with possible personal applications for respondents and asked for respondents' attitudes towards these technical novelties.

Depending on the answer, we grouped respondents' answers into positive and negative attitudes. We filtered out those who had never heard of the asked device or innovation. Answer categories "I am already using this", "I am open to this", "This is/would be a great help for me" are grouped as positive answers and "I find this daunting", "I doubt that I would find this helpful, "I am not interested in this", "I do not feel comfortable around this" were grouped as negative answers. Table 2 provides an overview of the distributions of positive and negative stances.

According to the data presented in Table 2, technical devices such as emergency tracking and response devices and Auto Fall Alerts are amongst those enjoying the highest degree of acceptance by persons 50+. Tablets, smartphones, emergency power-down systems for stoves and "ELGA", the Austrian electronic health record, are next with amounts varying from 42 to 49%. Social media networks, computers that can be voice-controlled and body-fat monitoring devices enjoy the least degrees of acceptance amongst all innovations listed.

CHART 2

Gender gap in positive attitudes towards new technologies for respondents 50+



Mean values having positive (1) or negative (0) stances towards new technology devices listed.

As in the previous section, probit regressions of gender and age on binary variables depicting respondents' positive or negative attitudes towards the specified technical novelties are implemented. Estimation results reveal partly significant gender differences and significant

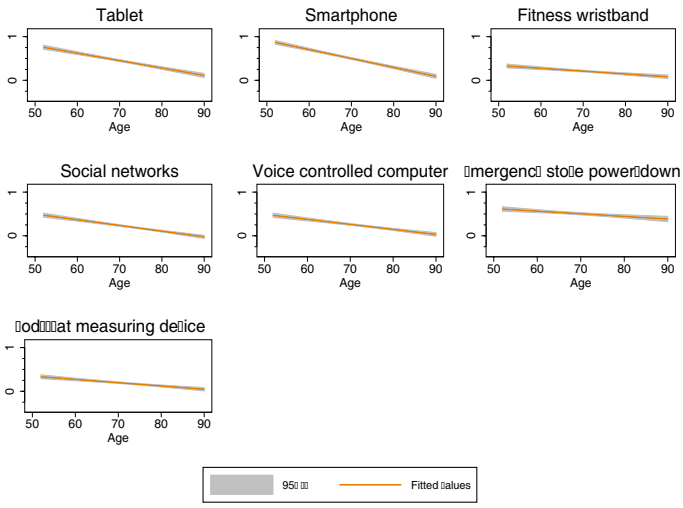
negative age trends.

Chart 2 provides an overview of gender differences in respondents' attitudes towards different technological devices or innovations for outcomes, where gender differences were statistically significant. Women appear more sceptical than their male counterparts towards tablets, smartphones and computers that can be voice-controlled, while they share much more positive attitudes towards Auto Fall Alerts, Personal Emergency Response Systems and emergency power-down systems for kitchen stoves compared to men. In the respective probit regressions the gender gap shows up highly significant, at least at the 95% confidence level. Other appliances or innovations listed, as fitness wearables, social media networks, emergency tracking systems and body fat monitors, do not reveal any significant gender contrasts.

The overall picture outlines female respondents' preferences for technical devices with very

CHART 3

Negative age trends in stances towards new technologies for respondents 50+



Respondent shares having positive (1) or negative (0) stances towards new technology devices from linear regression of age on different options in question 2 with 95% confidence intervals.

precise and concrete purposes. Men on the other hand are more open for smartphones, tablets and computer systems with rather generic applications. These results are in line with the outcome of analysis for question 1, that revealed strong preferences of men for communication and information applications on computers, tablets and smartphones.

Similar to the previous question a significant negative age trend is present for the majority

of options surveyed. As chart 3 suggests, this negative age trend is indeed quite substantial in the case of tablets and smartphones, falling from about 80% positive attitudes at the age of 50 towards almost complete rejection at the more hypothetical age of 100. A probabilistic regression of gender and age on the respective binary outcome variable delivers somewhat more precise numbers. For tablets we are able to predict about 67% positive attitudes at the age of 50 to 60 to as low as 9% for the age group of 90 to 100 years-old. For smartphones these numbers range from 76% at the age of 50 to 60 to 9% at the age of 90 to 100. For both tablets and smartphones,the predicted gender difference amounts to about 6 percentage points, and is statistically significant. It's worth noting that in similar analyses the predicted gender gaps for options g (Auto Fall Alert), h (Personal Emergency Response System), and i (Stove emergency power-control) - those are the preferred innovations or applications by female respondents – amount to 9, 6, and 13 percentage points in womens' favor respectively.

REGIONAL AND HOUSING PATTERNS

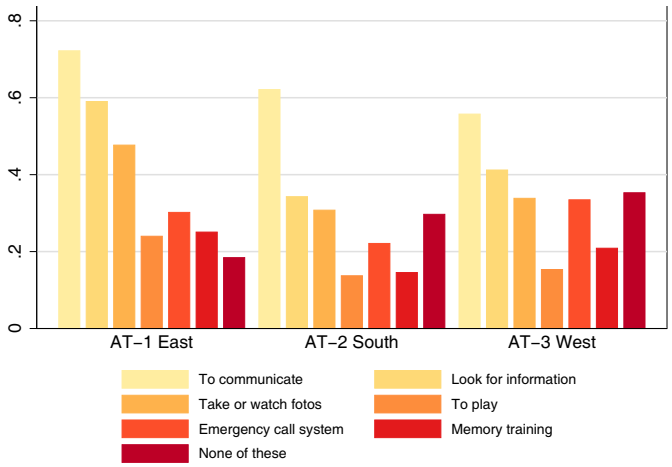
In the last part we try to figure out if there are any regional patterns present concerning "openness" towards technical innovations. To control for regional patterns, we group respondents based on their residence into NUTS-1 regions "East", "West" and "South" (Chart 4). This differentiation yields group sizes from a minimum of 716 respondents in southern Austria to the maximum of 1,391 respondents in eastern Austria.

CHART 4
NUTS 1 regions in Austria

CHART 5

Mean outcomes in "openness" towards applications of tablet-PCs and smartphones for NUTS-1 sub-regions of Austria.

Only mean values for statistically significant outcomes from probabilistic regression (not controlling for schooling degrees) reprinted. Respondent shares answering with "Yes" (1) or "No" (0), weighted.



A first glance at mean values for use and applications of technological innovations (answer options in question 1) for the different subpopulations reveals significant differences for most options (see Chart 5). These results can also be confirmed using a statistical analysis controlling for age, gender, and NUTS-1 region. Residents of Eastern Austria show most positive attitudes towards smartphones, tablets and their applications. For the other two subregions, the picture is somewhat more differentiated. With the exception of communications means, Western Austria scores second highest concerning positive stances towards tablets and smartphones, with the South appearing last among all three subregions.

A possible explanation – at least for the eastern Austrian outcome – might be rooted within differences in education and income characteristics. Eastern Austria has the country's highest share of people with an academic background. Together with the capital region average income also tends to be higher. Western regions, on the other hand, present a significant number of high-income individuals, that probably also contribute to a positive outcome. The south has the smallest number of persons with academic degrees, and mean income also gravitates to the bottom of the nationwide distribution. Southern respondents 50+ therefore turn out least inclined to considering computers, tablets, and smartphones as valuable and meaningful in-

novations.

To gather evidence for the above hypothesis of education and income as partial driving forces behind regional differences we include a control variable for highest school or academic degree obtained in the probabilistic regression. One possible way for evaluation of the second part of the above hypothesis – regarding income, or in a broader perspective, the general financial situation - might be controlling for housing characteristics of respondents. SHARE data have two variables that might serve the purpose of a proxy variables for income – type of housing and area of housing. Both variables belong to sections of the SHARE questionnaire answered by interviewers, and therefore guarantee a certain degree of objectivity. To circumvent problems of collinearity between those two variables we build interaction dummies consisting of all possible combinations of the two housing indicators.

We assume that respondents with more financial means exhibit a tendency towards owning a house of their own in the outskirts of some relatively bigger Austrian town. We have however no means of validating our assumption due to the lack of reliable information on the broader financial situation of respondents that is currently available in our data.

Once we repeat the probabilistic regression with our new control variables half of the NUTS-1 dummies included in the regression loose statistical significance. The control dummies for vocational training and tertiary degrees present odds-ratios higher than 1 and are statistically significant. Concerning housing, primarily one or two family dwellings exhibit a significant positive trend, as do all kinds of dwellings in the suburbs or outskirts of a big city (Vienna, Graz). The odds-ratios from the logistic regressions are now significantly smaller than in previous estimations, suggesting that income and education can indeed be considered driving factors behind the inter-regional differences presented.

One word of caution is needed in what affects our housing measures as proxies for respondents' financial situation. As has been outlined in the literature, the positive effect for certain types and regions of accommodations – especially family dwellings – might also be due to other, none-income related causes. Indeed it has been shown in the literature that dwellings,

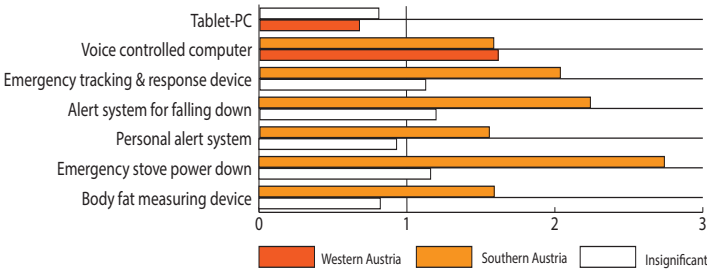
where multiple generations share the same roof, profit from positive "spillover" effects from younger generations onto older ones. Older generations might therefore present more positive attitudes to technical innovations because their children or grand-children demonstrate and "teach" them usage and applications of such devices.

These results are also confirmed by analyses of the question on attitudes concerning new technologies. In Chart 6 we reprint odds-ratios from a logistic regression of age, gender, educational degrees, region, and housing control variables on the binary outcome control variable depicting attitudes towards new technology devices. An odds-ratio above one for a certain characteristic (e.g. living in a certain NUTS-1 region of Austria) raises the possibility for a positive outcome, while an odds-ratio below one lowers that possibility.

CHART 6

Odds-ratios for positive stances towards different devices for Austrian NUTS1 regions "West" and "South" relative to baseregion "East".

Only statistically significant outcomes from logistic regression with control variables, weighted.



While tablets are less popular in southern regions, the opposite is true for computer systems that can be voice controlled, emergency tracking & response devices, Auto Fall Alerts, Personal Emergency Response System, emergency stove power-down systems and body fat monitoring devices. Once we control for education and income characteristics of respondents, the overall picture of respondents' attitudes towards technological innovations changes: Now it's the eastern regions being less susceptible to innovative devices and applications.

CONCLUSION AND FURTHER RESEARCH

To conclude, results show that attitudes of persons 50+ concerning the use of new technologies differ by type of equipment and its application. About 70% of persons 50+ can make use of technical devices for at least one activity. Very popular is the use of computers, smartphones and tablets for communications means, taking and watching photos and as medical alerts.

Results also point towards a variety of age and gender differences. The use of new technologies and positive attitudes towards new health technologies are declining with increasing age. This may be due to changing health and cognitive abilities. We can find this negative age trend for almost all technical equipment and applications. The relationship between the use of new technologies and physical and mental health is left for future research once all SHARE wave 6 data are available. We conclude that men are more interested in technology for information and communication purposes, while women show more interest in health related technological innovations, like vital function monitors. Concerning positive and negative attitudes towards technical innovations, women appear more sceptical than their male counterparts towards tablets, smartphones and computers that can be voice-controlled, while they share much more positive attitudes towards Auto Fall Alerts, Personal Emergency Response Systems and emergency power-down systems for kitchen stoves compared to men.

The evaluation of regional differences points to a variety of outcomes. We established that in general individuals living in the southern and western parts of Austria are a bit less open towards technical innovations and applications compared to residents of East Austria. This is mainly due to differences in education and income. Once we account for those differences, the picture is turned upside down. Some questions are left open, however, and it will be important to investigate the influence of family and household composition, and also to control for health conditions and possible limitations in activities of daily living in future research.

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