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Measuring Computer Skills of Older People in SHARE:

Evaluation of the item IT003_PC_Skills (IT module) using qualitative pretest interviews

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Abstract

In the context of the rapid digital transformation and its impact on the quality of life of older people, the study of digital skills in this age group is becoming increasingly important. The Survey of Health, Ageing and Retirement in Europe (SHARE) is a longitudinal study with the aim of gaining comprehensive insights into the life situation of older people over the age of 50 in numerous European countries. There is a tension in questionnaire development between the desire for panel stability, which ensures the consistency of questions over time, and the rapid pace of technological development. This requires continuous adaptation of survey instruments to ensure that they are relevant and up to date, without compromising the comparability of the data collected. One method for testing and revising questionnaires is the qualitative pretest interview (QPI). The aim of the project was to further develop the IT module of SHARE, which included an item on the self-assessment of older people's computer skills. To this end, survey specialists were trained in the use of the QPI and interviews were conducted with 17 people aged between 50 and 87. It was found that although most of the interviewees had hardly any difficulties understanding the computer skills item at first glance, they used highly individualised frames of reference for their self-assessment. As a result, the comparability of responses to quantitative surveys is limited. Approaches are formulated as to how this problem can be tackled in the further development of the item.

Keywords: questionnaire development, survey research, qualitative pretest interviews, computer skills in old age

Contents

1 Introduction: Measuring digital competences of older people in longitudinal surveys

The digital transformation in all areas of our lives is progressing at breakneck speed. It is accompanied by a change in the way we communicate, consume and organise our leisure time and is increasingly permeating our everyday lives (Stürz, Schlude, Putfarken, & Stumpf, 2022). In view of the rising number of older people in the context of demographic change, it is clear that digitalisation is an issue that affects not only younger people, but all parts of society. With regard to older people, digital technologies are recognised as having the potential to maintain and promote independence, autonomy and quality of life in old age. As a result, access to digital technologies and content and the digital skills required to use them are becoming an increasingly important prerequisite for ensuring active participation in social life (Bundesministerium für Familie, Senioren, Frauen und Jugend, 2020). However, surveys show that people who rate their digital skills as good and confident are less likely to be found in the older age cohorts in particular (Bürger & Sidel, 2020; Rathgeb, Doh, Tremmel, Jokisch, & Groß, 2022; Stürz et al., 2022). As a result, they are confronted with more difficult access to information in their everyday lives, poorer counselling opportunities and a higher level of stress due to an experience of social and societal exclusion (Jokisch & Göbl, 2022).

It is therefore crucial to better understand how older people use digital technologies in their everyday lives and the associated challenges, for example in order to identify opportunities to promote digital literacy among older people. High-quality data is a key prerequisite for evidence-based recommendations in ageing and digitalisation research. The multidisciplinary longitudinal study Survey of Health, Ageing and Retirement in Europe (SHARE) aims to gain comprehensive insights into the living situation of older people (50+) in Europe and Israel (Börsch-Supan et al., 2013). Part of the survey involves measuring IT usage and knowledge. This enables statements to be made about which population groups have access to the internet, use it and how confident they feel in using digital applications. In order to ensure that the stability of the questionnaire - and thus the quality and analytical potential of the data to be collected - can be guaranteed in the future in view of the rapid pace of digitalisation, it must be regularly reviewed in terms of comprehension and revised accordingly. As in all longitudinal studies, the desire for panel stability in SHARE competes with the topicality of question and subject formulations.

As part of the revision of the IT module of the SHARE questionnaire, the German version of the module was critically analysed using qualitative pretest interviews (QPI) with 17 people aged between 50 and 87 (Chapter 2). The aim of the project is, on the one hand, to further develop the measurement instrument by involving the target group. On the other hand, the qualitative approach is intended to gain in-depth insights into the use and knowledge of digital applications. The focus of this report is on the discussion of the item assessing personal computer skills (*IT003_PC_Skills*).

2 Method: Qualitative pretest interviews in survey research

In the following, the IT module of the SHARE survey and in particular the item on self-assessed computer skills contained therein is presented (chapter 2.1). In the following chapters, the QPI (2.2) as well as the interview partners and the general procedure within the QPI project (2.3) are analysed in more detail.

2.1 IT module (SHARE questionnaire) - item on computer skills

The IT module is a standardised questionnaire module of the SHARE questionnaire. It forms the basis for measuring older adults' use of the internet and technology and includes questions on computer and internet use in everyday personal and professional life, **ownership of computer-based technologies** and questions on how to use them. The IT module with the *PC skills* item has been part of the SHARE questionnaire since wave 5. The following analysis focusses in particular on German item *IT003_PC_Skills* of the IT module. This measures the respondents' computer skills on a 5-point scale from poor to excellent.

Item IT003_PC_Skills – English Version [German Version][1]

How would you rate your computer skills? Would you say they are...
[Wie würden Sie Ihre Computerkenntnisse einschätzen? Würden Sie sagen, sie sind...]

1. *Excellent [Ausgezeichnet]*
2. *Very good [Sehr gut]*
3. *Good [Gut]*
4. *Fair [Mittelmäßig]*
5. *Poor [Schlecht]*
6. *I never used a computer* (SPONTANEOUS ANSWER ONLY)
   [*Ich habe noch nie einen Computer genutzt* (NUR SPONTANE ANTWORT)]

Respondents also have the option of stating that they have no previous experience of using computers. However, this assessment is only available as part of a spontaneous response and is therefore not part of the scale that is usually presented. As an aid to understanding for the interviewees, the item also states that the term "computer" includes both a personal computer (PC) and a tablet PC (e.g. an iPad).

[1] cf. https://share-eric.eu/fileadmin/user_upload/Questionnaires/Q-Wave_9/paperversion_de_DE_9_2_2a.pdf

2.2 Qualitative pretest interviews & interview training

The QPI is an interview method that makes it possible to test questionnaire items before their planned use and to adapt formulations so that they are easier to understand (Buschle, Reiter, & Bethmann, 2022). As a result, they should help to generate more valid responses and ultimately develop better quality questionnaires. The procedure is based on the idea that understanding is seen as a social negotiation process in which the understanding of others takes centre stage. Accordingly, the interviewees are included as co-experts and the meaning of the content is negotiated jointly in a dialogue between interviewer and co-expert. It is thus rooted in the qualitative-interpretative methodology (Buschle et al., 2022).

The aim of using the QPI method as part of the SHARE questionnaire development is primarily to analyse the existing German version of the IT module with regard to the clarity and comprehensibility of the items it contains and to subsequently adapt them. The qualitative interviews provide a deeper insight into the extent to which both individual terms and holistic formulations are understood by the potential target group and also make it possible to extract the reasons why they are understood in this way. This allows latent ambiguities and ambiguities in the survey to be uncovered and subsequently adjusted. Furthermore, the QPI can be used to check the extent to which the given answer options reflect the interviewee's understanding. Since the focus of the interviews is on dialogue-based exchange, the interviewees can discuss and formulate specific suggestions for improving the items. The process is iterative. Starting with the recruitment, organisation and implementation of the interviews, the findings are analysed in a workshop and the items are then adapted. These are in turn reviewed by the QPI and analysed in workshops (Hunsicker et al., unpublished).

For the project to test and subsequently adapt the IT module of the SHARE survey, 8 interviewers were recruited and trained to conduct the QPI. This includes, on the one hand, research assistants from SHARE itself. On the other hand, 3 interviewers from the Bavarian Center for Digital Health and Social Care - a research institute of the Kempten University of Applied Sciences with a focus on ageing, digitalisation and care - were brought in. The training took place during three virtual meetings at the end of 2022 and in spring 2023. The aim of these meetings was to teach the theoretical basics of qualitative pretest surveys, to learn appropriate communication strategies and to work out how to conduct the QPI in a team. Before the start of the field phase, this training content was refreshed again and the procedure for recruiting interview partners was discussed.

2.3 Sample & realisation

The QPI method is qualitative in nature and does not aim to achieve statistically representative results. For this reason, the sample for the project was not selected randomly, but rather purposefully according to characteristics relevant to the study. The aim was to achieve a minimum level of diversity in terms of age (from 50 years), gender and current employment status. Recruitment was carried out via personal contacts of the eight trained interviewers. In order to avoid possible bias effects due to existing personal relationships in the surveys, they were instructed not to conduct the QPI with their own contacts, but to rotate them among the interviewers. However, this could not be completely fulfilled in the implementation.

17 older adults (12 women and 5 men) were recruited to take part in the QPI. They range in age from their early 50s to 87 years. At the time of the survey, six of them were aged between 60 and 69, four were aged between 70 and 79 and two were over 80. While six people have a job, eleven respondents are already retired. All respondents had a minimum level of experience with the internet and had used it in the recent past. People who have no experience with the internet or computers and do not use them (so-called offliners) could not be reached through the interviewers' personal networks at this time and therefore could not be recruited for the study. Most of the participants live in a city, while six of them live in rural areas.

The interviews took place over a period of two weeks in May and June 2023. They were conducted both face-to-face and virtually via the *Zoom* platform in German and lasted between 16 and 163 minutes. After the participants were informed about the objectives of the project, the subject of each interview was the joint clarification of understanding of the individual items of the IT module. For this purpose, the questions (partly with the notes for the interviewees contained in the questionnaire) were presented to the interviewees. At the beginning of each item, it should be read out loud by the interviewee, if possible. Subsequently, the first views on formulation difficulties, understanding of the content or other perceived anomalies were expressed using the 'thinking aloud' technique, which were deepened by possible follow-up questions from the interviewer. Each item was discussed until no more added value could be generated from the perspective of the interviewer. Each interview was audio-recorded and supplemented with notes based on the interviewer's own observations. The recordings were then transcribed using the *f4* programme and formed the basis for the analysis workshop. The *MAXQDA* analysis software was used for the analysis. All interviews were coded deductively based on the questions of the IT module and inductively for relevant, cross-interview results.

3 Presentation of results: Computer skills of older people

The analysis of the interview material not only allows statements to be made about the extent to which the formulations of the items were understood by the individual interviewees. Rather, insights can be gained into the interviewees' perceived computer skills (Chapter 3.1) and the background to how they arrived at this self-assessment (Chapter 3.2).

3.1 Assessment of own computer skills

Overall, most respondents rated their own computer skills as *fair* or *good*. Only a few people rated them as *very good*. The rating *excellent* - like the statement *I have never used a computer* - is not used once to describe their own knowledge.

Self-assessment: fair computer skills

Seven of the 17 people interviewed agreed that their own computer skills were fair. This group covers an age range of 56 to 81 years and is predominantly made up of women (and one man) who are no longer working. They state that they use the computer for *"simple, mundane things"* (T6, item 101)[2]. This includes tax returns, sending photos, the software used in their previous job, finding and printing out crossword puzzles or learning *"new things"* (T12, item 54). They justify their self-assessment by saying that a simple and intuitive use of the computer is easily possible, as it has already played an important role in their previous professional context. However, if these interviewees are confronted with problems that are more specific to their personal experience, they have to ask their children or grandchildren. One participant commented as follows: *"Well, if you have to set something up, I can also do it partly through the settings. But then sometimes there are things where I say, how was that, I have to read up on it again first and then I just ask the grandchildren and that's just easier"* (T6, pos. 103). The necessity of always having to ask for help prompted one interviewee to rate her computer skills as poor. However, she changes this assessment in the course of the interview: *"Well, maybe you could say fair. I don't know. I can do quite a lot. But sometimes I accidentally press a button and think 'Huh, what's that? I didn't mean to do that'. [...] Well, okay, but I usually manage and can undo it again"* (T11, pos. 415). Another person revises their originally assessed poor knowledge following a process of reflection on their own computer biography in the course of the interview: *"Well, I did use it, but not with pleasure [...] I should have dealt with it more, that I would have enjoyed it and that I might have a laptop [...] Well, I didn't use it badly, I managed it [...]"* (T3, pos. 114 - 144).

Self-assessment: good computer skills

Five of the respondents rated their own computer skills as *good*. A further two people also rated their skills as *fair* to *good*. This includes five women and two men aged between their early 50s and 87, although it should be noted that six of them are in the 50-70 age range. Their personal computer use relates to everyday and work-related use of required programmes. In one interview, this was expressed as follows: *"But simply [...] the usual computer skills, perhaps also image editing programmes, i.e. what you actually need in everyday life, that would be part of it for me"* (T16, pos. 40). In particular, the use of certain Office applications such as *Excel* is

[2] All quotes have been translated from German into English.

repeatedly emphasised: *"It's now [...] not just the basic things, [...] but it's also a bit of Excel, a bit of things like that [...]"* (T1, pos. 210 - 219). They also justify their self-assessment by stating that their computer skills are sufficient for the necessary purposes: *"So I could already do my stuff [...]"* (T7, pos. 28). At the same time, however, it is also emphasised that there is room for improvement, as one participant summarises as follows: *"So that's why I only say good, [...] because I don't think that I can make full use of the programmes with what they offer"* (T16, pos. 46).

Self-assessment: very good computer skills

Three interviewees came to the conclusion that their computer skills can be categorised as better than good. Two of them rated this as *very good*, while one person positioned themselves in the *good to very good* range. This applies to two men and one woman between the ages of 50 and 67. The use and justification of this assessment also relates to the use of Office applications within the work context. Computer skills are accordingly understood as *"user skills"* (T4, item 61). Confidence in using computers is based on the respondent's own biography and the context of use *"[...] I grew up with it. Everything is great for me. I get on quite well with everything so far. [...] But apart from that, if I'm talking about us who work with computers on a daily basis, there's no such thing as fair from my point of view. Because for the job we do, you have to have good computer skills at least"* (T17, pos. 48 - 54). However, from the point of view of one interviewee, it is not necessary to have full knowledge of the respective programmes. Rather, largely problem-free use for everyday purposes is a decisive factor in justifying one's own computer skills*: "But Excel as [one of] my favourite programs can be used in so many ways and I don't know everything by far. [...] But for my own work, for my own job, I think what I have is sufficient"* (T17, pos. 50).

3.2 Respondents' frame of reference for self-assessment

With regard to the categorisation of their own computer skills, it can be seen on the one hand that the skills relate to the use of certain programmes, in particular Office applications (e.g. *Word*, *Excel*, etc.). On the other hand, most respondents agree that these applications do not need to be fully mastered for their assessments. The use of other people to help with specific problems is evident across all response options. To clarify why the respondents nevertheless arrive at different self-assessments despite similar reasons, the frame of reference used for the assessments must be analysed in more detail (see Table 1 for an overview).

A frequently mentioned aspect that respondents refer to in their self-assessment is the perceived demands that their own everyday life places on computer use. One participant illustrates this with the following statement: *"Well, uh, there are still some things [...] that go beyond what I normally do [...] and then very good or excellent Internet or computer skills are required to advance in this area, but for what I need, I manage well"* (T1, pos. 191 - 199). The content-related focus of computer use in everyday life plays an important role here, as illustrated by the statement of one participant: *"Do I now take my son, who sits at home on the computer and plays games? His computer skills are very limited, let's say very limited. [...] If I assume that we work with the computer on a daily basis, I don't think there is such a thing as fair. Because for the job we do, you have to have good computer skills at least"* (T17, Pos 46 - 54).

The extent to which the interviewee's own focus as a frame of reference can make comparability between interviewees more difficult is particularly evident in the example of one interviewee. Before retiring, he worked in software development and rates his own computer skills as *fair*. He explains this as follows: *"But the subject has become so complex that probably 95 per cent of people who work with computers only have a fair knowledge of what they are doing. [...] But I just realised that it (...) is an incredibly broad field and that all the people who deal with it are basically specialists"* (T10, pos. 34 - 40). While many interviewees cite a lack of programming knowledge as a key differentiator for an even higher categorisation, in this case, specialist and contextual knowledge is more of a barrier to a higher categorisation. Within this answer category, he places himself on the same level as other interviewees whose personal everyday requirements can be solved with a far lower level of knowledge - for example, interviewees who print out crossword puzzles, send photos or do tax returns on their computer.

This also shows that certain groups of people are often also used to assess their own knowledge. These can be specialists from the professional environment - as the example illustrates - but also entire generations that are used as a comparison group. As part of the QPI, the interviewees draw comparisons with younger generations in particular, to whom better computer skills are attributed, as well as with their own parents' generation (as an example of poorer skills). Their own age and ideas about the extent to which this is associated with certain competences in relation to computer use is a topic in almost all interviews. There is a basic assumption, often strongly emphasised, that 'the young generation' is familiar with technology and the Internet, although little differentiation is made within this group. Criteria for good online skills are associated with the ability to answer technology-related questions, whereby children and grandchildren are unquestioningly ascribed excellent knowledge: "*I: 'Who do you consider to be a comparative person or group where you say they have excellent Internet skills? [...] T: 'Oh, I would think of my grandchildren. [...]. Everyone has two screens at their desk at home'"* (T6, pos. 92 - 101).

This perspective is sometimes expanded by comparing one's own skills over the period of use: *"I've actually been working on computers for 40 years. That's why, when it all started back then, we were already working on computers. But it has always changed, the technology too"* (T6, pos. 91). Another participant used her own usage biography as a reference: *"Well, I* *was already over 30 when I first started working with the PC [...]. [...] I approached it anxiously at first. [...] But then over the years - until I was approaching 60 (laughs) - I lost my fear to some extent"* (T15, pos. 220 - 228).

One interviewee also uses her own generation to categorise herself: *"I just think that in my generation, everyone can only do what they have to do, I have the feeling. And if I say I'm fair, then I can often do more than people who work with it at work"* (T5, pos. 95). She also emphasises a gender reference: *"Women in particular, I think you have to say again/ Yes, it's easier for them to say they're fair. A man would [say]: 'Yes, I can manage'."* (T5, pos. 107).

Overall, the chosen frame of reference, which is used to assess the respondents' own computer skills, mostly refers to personally experienced situations, tasks and people with whom the respondents are or were involved in everyday life. In order to be able to compare the selected response categories, an understanding of this framework is of central importance.

Table 1. *Rationale and frame of reference for the assessment of computer skills*

P	Valuation	Utilisation and justification	Frame of reference
1*	*good*	• more than "basic things" (e.g. Excel) • copes well	• The demands of everyday life • "other people" who are better
2	*fair to good*	• Google search for private hobbies • Travel bookings • No mention of the reason	• The demands of everyday life • Requirements of an office job
3	*fair***	• learnt late, but then mastered what was necessary (without joy)	• Requirements by others ("the")
4*	*good to very good*	• Use of "applications" • No mention of the reason	• Requirements for own use • Programming and IT professions
5*	*fair*	• No mention of what is used • Intuitive use • occasionally needs help	• own generation, especially those who are not working • own sex (women)
6	*fair*	• Sending photos, tax return, changes to settings • after 40 years of computer experience, technology has changed • must occasionally ask the grandchildren	• Current state of the art compared to own utilisation biography • Younger generation (grandchildren and own son)
7	*good*	• Simple applications at work • has experience as a user	• Requirements of the previous profession • Comparison with programming
8	*very good*	• No mentions	• No mentions
9	*fair*	• No mentions	• No mentions

P	Valuation	Utilisation and justification	Frame of reference
10	*fair*	• Former software developer • Assumption that nobody is really good with computers (even in the IT context there are only specialists, hardly any generalists)	• People who work professionally with computers (specialists) • People who only use computers
11	*fair***	• prints crossword puzzles • Can cope with everyday demands • Partly unsafe to operate	• The demands of everyday life • Expressly no comparison with other people
12	*fair*	• to "learn new things" • can do the necessary things • occasionally has questions (e.g. son)	• younger generation
13*	*good*	• can operate it “super well“ • needs help with problems (e.g. hardware)	• Attempt at an objective self-assessment • No comparison with age groups
14	*fair to good*	• Experience through *learning by doing* • has problems understanding instructions	• People who have been professionally qualified (training, courses)
15	*good*	• had to learn it for the job and it "worked" • there was recognition from colleagues	• The demands of everyday working life • Your own computer biography: from initial fear to use
16*	*good*	• e.g. image editing programmes • copes well with everyday life, occasionally needs help	• The demands of everyday life • Comparison with programming
17*	*very good*	• "System programmes" (Office applications) at work • has grown up with it and copes well with it in everyday life (work) • for better knowledge: be more familiar with Office programmes	• The demands of everyday life • Content application: Comparison of son (computer gamer) vs. professional use • Comparison with programming • Older generation (own mother)

Note: *indicates respondents who are currently working; **respondents initially rated their knowledge as poor; P = participants.

4 Categorisation of the results and conclusion

To summarise, most respondents to the qualitative pretest interviews rated their computer skills as fair or good. This also becomes clear when looking at the quantitative analyses (Chapter 4.1). These show that the group of those who state that they do not use a computer has decreased in recent years, while the percentage of those who rate themselves as good, and especially very good, has risen significantly. In the interviews, however, only a few people rated themselves as very good. Subjective frames of reference, which people use as a guide when making decisions, play a key role in categorisation. These differ with regard to the tasks to be performed with the computer in everyday life and the corresponding context of use. In addition, self-selected groups of people (according to gender, age cohort or professional qualification), which appear important for personal differentiation, play a significant role in the assessment.

4.1 Empirical categorisation based on quantitative findings

Quantitative analyses of the international SHARE data

Various research studies have already analysed SHARE data in the past and addressed the issue of computer skills. The findings from various countries and different SHARE waves have been taken into account. Quantitative analyses have repeatedly shown that people's assessment of their own knowledge deteriorates with increasing age and that they increasingly state that they have no experience of using computers (Augner, 2022; Halmdienst & Schmidt, 2018; Kalmus, Tambaum, & Abuladze, 2023; Midão et al., 2020). Computer skills are associated with mental and physical health and cognitive abilities, among other things (Augner, 2022). In addition, it is clear that men in many countries tend to rate themselves better than women (Halmdienst & Schmidt, 2018; Midão et al., 2020; Schütz, 2023) and that retirement is associated with a higher probability of lower computer skills (Cavapozzi & Dal Bianco, 2022).

Quantitative analyses of SHARE data from Germany

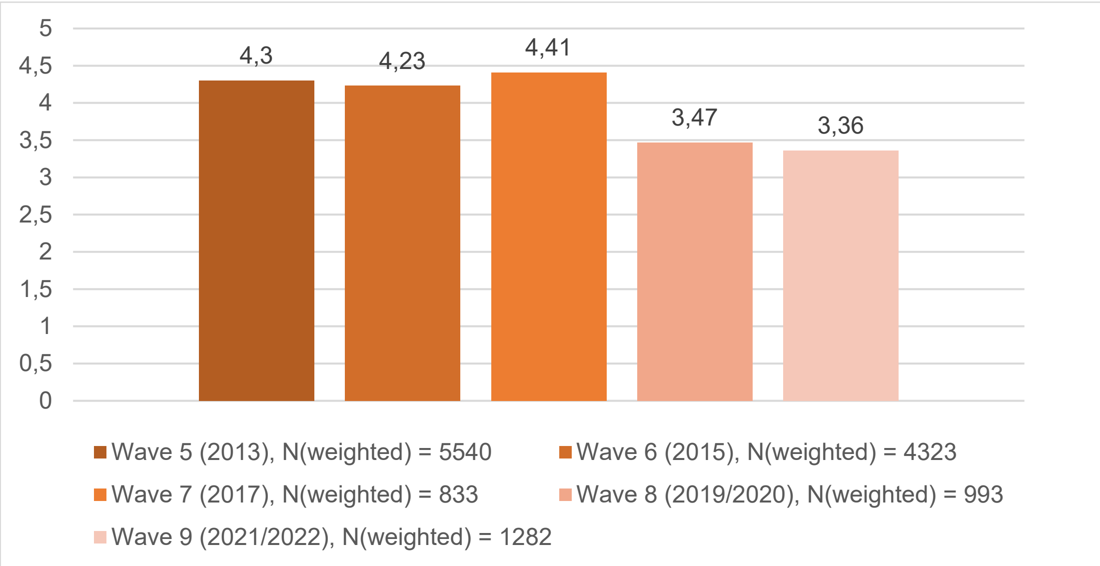
A direct comparison between SHARE waves 5 to 9 in Germany shows that the average computer skills to be assessed improve over time (Table 2). The values are based on a scale from 1 (excellent) to 6 (I have never used a computer), with higher values indicating poorer computer skills. The increased mean value in wave 7 (see Figure 1, Table 3, Figure 2) is primarily due to methodological aspects and thus age effects. In wave 7 - as in wave 3 - retrospective life course data were again collected (SHARELIFE).

Table 2: *Computer skills in Germany (50+) for waves 5 and 9*

Computer skills	**Percentage**	
	Wave 5 (year 2013)	Wave 9 (year 2021/22)
Excellent	2,68	7,93
Very good	6,93	15,19
Good	20,66	33,91
Fair	24,61	25,39
Poor	17,30	10,74
I never used a computer before	27,81	6,83
***N** (weighted)*	**5540**	**1282**

Notes. Data: SHARE waves 5,9, rel9-0-0, age 50+, weighted, own calculation. Question IT003_PC_Skills is a panel question in wave 5 and a baseline question in wave 9, which explains the smaller number of cases in wave 9.

Figure 1: *Average computer skills in Germany in SHARE waves 5 to 9*



Notes. Data: SHARE waves 5,6,7,8,9, rel9-0-0, age 50+, weighted, own calculation. The question IT003_PC_SKills is a panel question in waves 5, 6 and 7 and a baseline question in waves 8 and 9, which explains the smaller number of cases in waves 8 and 9. Scale: 1 = excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor, 6 = I have never used a computer.

All participants who did not answer the SHARELIFE questionnaire in wave 3 or were not yet part of the sample were presented with a separate SHARELIFE questionnaire in wave 7. Only respondents who had already answered the SHARELIFE questionnaire in wave 3 received the regular SHARE questionnaire and the IT module it contained (Bergmann, Scherpenzeel, & Börsch-Supan, 2019). The respondents of the German-speaking sample of the 7th wave who received the regular SHARE questionnaire (including the IT module) were on average 71.66 years old (N = 836). The other subgroup of the sample, which did not answer the IT module, was younger with an average age of 66.17 years (N = 2984) (see also age groups in Table 3 and Figure 2). It should also be noted that the item IT003_PC_Skills was a panel question in waves 5, 6 and 7 (i.e. the item is asked repeatedly in each wave and is therefore a time-varying characteristic) and a baseline question in waves 8 and 9 (i.e. the item is asked once as a time-constant characteristic) .[3]

Table 3 and Figure 2 show the average computer skills in Germany, broken down by age group, across SHARE waves 5 to 9. The values are based on a scale from 1 (excellent) to 6 (I have never used a computer), with higher values indicating poorer computer skills. To summarise, it can be seen that all age groups rate their computer skills better over time, with older age groups rating themselves as having poorer skills overall.

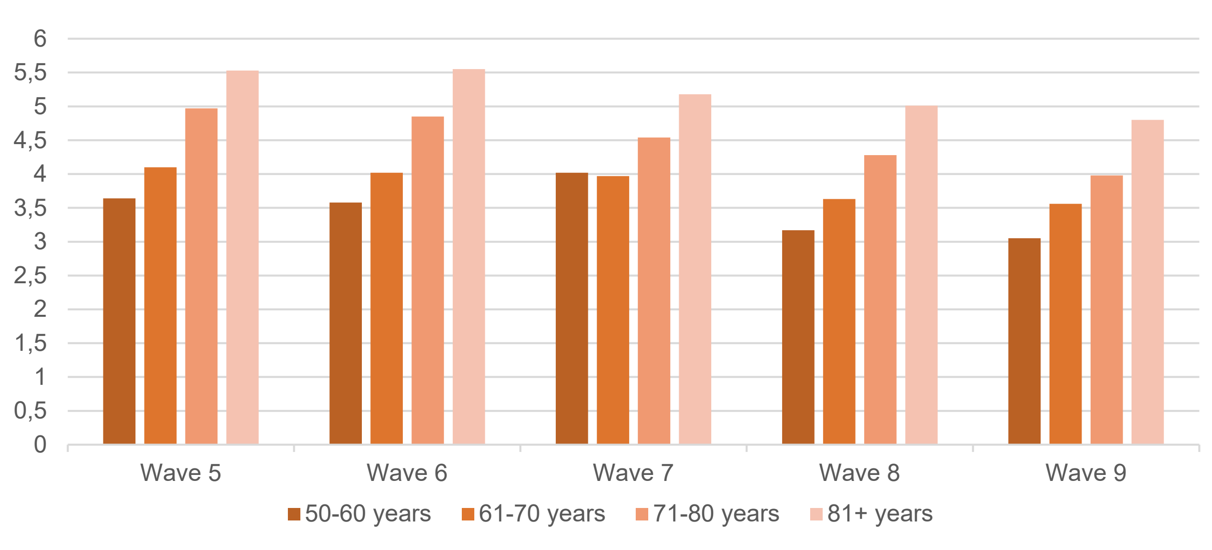
Table 3: *Average computer skills in Germany in SHARE waves 5 to 9, broken down by age group*

SHARE wave	**Age groups**			
	50-60 years	*61-70 years*	*71-80 years*	*81+ years*
Wave 5	3,64	4,1	4,97	5,53
Wave 6	3,58	4,02	4,85	5,55
Wave 7	4,02	3,97	4,54	5,18
Wave 8	3,17	3,63	4,28	5,01
Wave 9	3,05	3,56	3,98	4,8

Notes. Data: SHARE waves 5,6,7,8,9, rel9-0-0, age 50+, weighted, own calculation. Scale: 1 = excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor, 6 = I have never used a computer.

[3] cf. questionnaires:
https://share-eric.eu/fileadmin/user_upload/Questionnaires/Q-Wave_5/w5_en_capi_cov-Generic.pdf https://share-eric.eu/fileadmin/user_upload/Questionnaires/Q-Wave_6/w6_en_capi_main-Generic.pdf https://share-eric.eu/fileadmin/user_upload/Questionnaires/Q-Wave_7/w7_en_capi_main-Generic.pdf
https://share-eric.eu/fileadmin/user_upload/Questionnaires/Q-Wave_8/paperverstion_en_GB_8_2_5b.pdf
https://share-eric.eu/fileadmin/user_upload/Questionnaires/Q-Wave_9/paperversion_en_GB_9_2_2a.pdf

Figure 2: *Average computer skills in Germany in SHARE waves 5 to 9, broken down by age group*



Notes. Data: SHARE waves 5 (weighted N = 5540), 6 (weighted N = 4323), 7 (weighted N = 833), 8 (weighted N = 993), 9 (weighted N = 1282), rel9-0-0, age 50+, weighted, own calculation. The question IT003_PC_Skills is a panel question in waves 5, 6 and 7 and a baseline question in waves 8 and 9, which explains the smaller number of cases in waves 8 and 9. Scale: 1 = excellent, 2 = very good, 3 = good, 4 = fair, 5 = poor, 6 = I have never used a computer.

Comparison with QPI results

In contrast to quantitative analyses, the qualitative approach of the QPI makes it possible to determine both the respondents' self-assessment and the reasons for their answers. At first glance, it can also be seen here that both women and respondents who are already retired - and therefore older respondents - are more frequently represented in the *fair* response category than men and working interviewees. *Fair* is the lowest level selected for self-assessment within the interviews. At the levels *good* and especially *very good*, the ratio approaches or even reverses at the last level. The starting point for this assessment lies in their own way of using computers, taking into account self-referenced, model examples that are understood as the upper and lower limits of the assessment: the younger generation or programmers on the one hand and the older generation of their own parents or offline users on the other. The recurring comment of comparing one's own knowledge with the (imagined) usage experiences of the younger generations could point to inherent age-related stereotypes (Köttl, Gallistl, Rohner, & Ayalon, 2021) among the participants that have recognisable effects on their response patterns.

However, it should be borne in mind that - unlike in the regular SHARE surveys - there are no participants in the QPI who would rate their knowledge as poor or who do not use a computer. In addition to the low number of participants, the targeted recruitment via personal contacts may play a role here. The interviewers were unable to recruit people without knowledge within the specified time period. The individual understanding of the item (see chapter 4.2) and response tendencies that can arise when answering questionnaires (see chapter 4.3) must also be taken into account when interpreting the results.

4.2 Item formulation

The answers given during the interviews must be reflected on in the light of the wording of the items. The question about computer skills is formulated in general terms; a specific framework is not specified for the answer. Although it is clear from the explanatory statements that there is a different understanding of the concept of computer skills - mostly with regard to personal applications - this is hardly the subject of criticism within the interviews. The understanding differs above all with regard to the associations they seem to have with computers. These range from specific software applications and online activities to the hardware of a computer and technical devices that can be used with a computer (e.g. scanners). Although some of the interviewees indicate that they are aware of the different understandings, at the same time it is emphasised that the question is clearly formulated in this way. The findings show that although a generally formulated question about computer skills in this form no longer appears to be up-to-date, it is nevertheless still understood by the target group.

When asked, the QPI participants reported that a differentiation between predefined target groups would nevertheless facilitate comparability: *"That would have to be categorised differently. Someone who works with a computer or has worked with a computer and is now retired has completely different expectations of themselves"* (T11, item 433). According to another interviewee, it would be even easier to categorise the possible answers using school grades. At the same time, it was pointed out that adapting the wording of the item could also create more comprehension problems: *"Because, without wanting to offend my mother, for God's sake, but if it were to say 'as an IT specialist', then the question would in principle be unclear to her. [...] You would have to say [...] in German and not some technical terms"* (T4, pos. 78 - 80). It is also pointed out that a comparison with people whose computer use differs greatly from their own use is generally not possible.

It is also noticeable that the two poles of *poor* and *excellent* were not used and, with the exception of two cases, were not expressed as a possible response option. Accordingly, fair is the lower limit that is considered by the people themselves in the evaluation. Although it represents the linguistic link between a poor and a good rating, this may indicate that the mediocrity of computer skills is viewed rather negatively. The rather critical perception of this answer option is reflected in the statement of one participant: *"But fair doesn't sound neutral either, I think (laughs). [...] But I think it's also satisfactory, the grade three would also be, if you* *have the grading system, (...) would also be the middle, so to speak"* (T16, pos. 50 - 52). The statement shows that this is due to the perceived meaning of the word in German. The question therefore arises as to the extent to which similar evaluations of the respective equivalent terms occur in other languages (e.g. *fair* in English compared to mittelmäßig in German[4]). A comparison of the data for the item between the countries should therefore take into account the country-specific, latent meanings of the response options.

Finally, it must be mentioned that the question of item formulation was discussed in varying degrees of detail in the interviews. The interviewers have different professional and methodological backgrounds and therefore also vary greatly in their experience in dealing with qualitative interviews. The interviews differed accordingly in terms of length and the focus of the follow-up questions. The importance of item formulation for the individual participants is therefore only actively indicated in some interviews. The recruitment process of the interviewers and their training should therefore continue to be the subject of a methodological evaluation of the QPI.

4.3 Response tendencies & behaviour

In addition to aspects of item formulation, response tendencies can also be used to explain the avoidance of extreme responses. One such response tendency is social desirability. It describes the tendency of people to give as positive a picture as possible when answering questions - whether by emphasising desirable or avoiding undesirable behaviour (Bogner & Landrock, 2015). In the case of the computer skills to be assessed, people therefore avoid presenting themselves to the interviewer as poor, very good or even excellent in their self-assessment, in the perception that this is more likely to be socially approved. Response tendencies such as these represent potential sources of error in social science surveys (Bogner & Landrock, 2015). One way of counteracting bias caused by socially desirable response behaviour is to ensure the greatest possible anonymity during the survey (Nederhof, 1985) or to measure social desirability as a control variable (Bogner & Landrock, 2015). Questionnaires such as the social desirability gamma (KSE-G) are available for this purpose (Kemper, Beierlein, Bensch, Kovaleva, & Rammstedt, 2012). However, there is empirical evidence that women and older people in particular - who represent the main group of QPI participants - are less inclined to give socially desirable answers (Krumpal, 2013).

The situation of the survey must also be taken into account when interpreting the results. The qualitative nature of the QPI offers more room for the interviewees to think about and reflect on their answers. For example, there were cases in which interviewees corrected their initial response and then changed their mind. This is exemplified by one participant who

[4] The English response categories of the item in the SHARE Generic Main Questionnaire are: 1. excellent 2. very good 3. good 4. fair 5. poor 6. I never used a computer.

initially assessed her computer skills as poor: *"Poor. [...] Yes, because fair would be a lie, because I get help if I can't do it."* (T11, pos. 411 - 413), changed this assessment in the course of the interview by considering her own requirements.

In addition, three people did not commit to one answer option, but categorised their assessment between two answers (*fair to good* and *good to very good*). In another case, the interviewee initially wavered between the categories *fair* and *good* and finally decided in favour of the answer *fair* after being asked by the interviewer to commit herself. The QPIs were conducted in such a way that the respective item was not only presented for reading, but the participants were also encouraged to think about terms and content and to express them aloud. It must be borne in mind that the content and time spent on the respective questions would differ within a quantitative survey and that the respondents would show different response behaviour accordingly. On the one hand, it is conceivable that many interviewees would stick to their initial response if this could not be realised in the subsequent interview or forced by the interviewer. On the other hand, the participants would be forced to decide in favour of a single answer option. The insights gained in a qualitative interview situation are therefore only comparable with the CAPI measuring method of regular SHARE interviews to a limited extent.

4.4 Consequences & conclusion

The results of the QPI illustrate a variety of frames of reference that people use when assessing their computer skills. In order to understand why people arrive at their self-assessment and what difficulties in understanding they face when answering such a question, more precise knowledge of the individual frames of reference is essential. As these frames of reference can only be ascertained to a limited extent or not at all in quantitative surveys, it is questionable to what extent it is possible to compare results between individuals. The cognitive value of a generally formulated item must also be questioned. In this context, the questioning of competences with regard to computer use without indicating the respective frame of reference or specifying the response categories is critical. As a result, participants use different and highly individualised frames of reference that are neither comprehensible to the researchers nor other target groups and are therefore hardly comparable. Various approaches are conceivable to counteract this.

It can therefore be argued that, above all, it is necessary to find out more about the different frames of reference that individuals and groups of people use to assess their computer skills. Qualitative approaches lend themselves to exploring such backgrounds. In order to gain a comprehensive insight into this, it would be necessary, above all, to interview more people and to ensure an even distribution with regard to various socio-demographic characteristics (e.g. age, gender and level of education). Research should not only be conducted into which frames of reference are used by which people, but also into how such references are formed.

Another aspect concerns the item formulation. On the one hand, it is conceivable to provide a frame of reference using examples. However, the difficulty lies in finding a comprehensible formulation for all people of different backgrounds and ages (see chapter 4.2). Instead, a differentiation of the question according to several more specific computer programme skills would also be a conceivable alternative to address the problem. This is due to the fact that some of the interviewees specified their computer skills during the interview in terms of programmes (e.g. *Excel*) that are important to them in everyday life. In this way, **self-assessed knowledge in dealing with programmes and applications that are considered important** could be asked individually. Existing questionnaires such as the DigCompSAT (Cliffort, Kluzer, Troia, Jakobsone, & Zandbergs, 2020) with 82 items - or its German-language translation, the bidt-SZ *digital barometer* (Stürz et al., 2022) - for **measuring digital skills**, could be included in the survey. The main disadvantage of a smaller-scale skills survey and the use of the *DigCompSAT* is that the previous survey process would take considerably longer. Particularly in view of the older target group of the survey and the multi-thematic orientation of SHARE, such a solution is considered impractical. It would also fundamentally change the content of the original item. In its current form, the item is designed to be more open and allows individual frames of reference to be incorporated. The question is therefore what objective should be pursued with the item in future.

From this perspective, it can also be noted that the current assessment of computer skills is based more on the subjective experience of the individual and corresponds less to an objective measurement of skills. In this respect, a shift in the content orientation of the item would be conceivable, for example by asking about **satisfaction with one's own computer skills** and thus focussing more on this subjective experience and the associated subjective satisfaction with one's own skills in using computers. Although in this case the respective answer would also be guided by a personal frame of reference, which is linked to the individual living conditions, a central problem of the current item could be alleviated. Comparability would be easier to argue due to the subjective-emotion-related character of the construct to be measured than is the case when surveying an individually perceived ability.

Overall, it can be stated that the question of self-assessment of one's own computer skills is related to numerous subjective components of experience that serve as a frame of reference. It is difficult to measure or even control these subjective components within a quantitative survey. Accordingly, it can be argued that the informative value and comparability of this item is reduced within the scope of the survey. Even if - as explained above - an adaptation of the item with regard to the level of detail or the construct to be measured is accompanied by its own disadvantages, it should be considered to what extent the advantages would nevertheless outweigh the disadvantages.

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- SHARE-ERIC (2024). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 5*. release version: 9.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w5.900
- SHARE-ERIC (2024). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 6*. release version: 9.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w6.900
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- SHARE-ERIC (2024). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 8*. release version: 9.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w8.900
- SHARE-ERIC (2024). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 9*. release version: 9.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w9.900

see Börsch-Supan et al. (2013) for methodological details.

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