

Experiencing Computer Anxiety Later in Life: The Role of Stereotype Threat

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Abstract. In the current paper we use semi-structured interviews ($N = 12$) to reveal instances which trigger age-based stereotype threat and subsequent computer anxiety for older individuals, and potential impact on their technological self-efficacy. The results show that situation-specific anxiety arises in situations when older people were faced with children or younger adults who presented higher ICT skills. We argue that when the situation is “powerful enough” to increase older people’s awareness of the negative stereotypes associated to their group in relation to technology, this would increase computer anxiety and could have a negative influence on technology appropriation and performance.

Keywords: Stereotype threat · Computer anxiety · Older people · Age-based stereotype

1 Introduction

1.1 Computer Anxiety and Age Differences

The widespread use of information and communication technologies (ICT) seems to lead to the assumption that most individuals feel comfortable using them. Research on the human-computer interaction is currently focused on technology dependence, a phenomenon that occurs when individuals are deprived of their desired use of ICT devices [1]. However, there are individuals who use computers and other ICT devices reluctantly, and those who do not feel comfortable at the thought of using them. Computer anxiety is a negative emotional feeling or evaluation experienced when an individual encounters a real or estimated task which requires the use of computers or of other computer mediated technology [2]. This type of anxiety is often compared to test anxiety or math anxiety [3, 4]. Authors [5, 6] agree that such negative feelings impact performance or at least have negative effects on the individuals’: competence with computers, ability to enjoy computer related tasks, self-evaluation of people’s own ability to handle computer tasks, ability to focus when using new technologies or receiving training in using them (getting easily distracted), and ability to overcome the initial reluctance to try new devices.

Studies on feelings of anxiety towards computer and computer use go back to the early 1980s, when computers were mainly depicted as instruments to achieve higher

efficiency and productivity [7]. The feeling of fear, unease and tension towards computer use proved to be shared by large segments of population, both old and young and with varying degrees of familiarity and skill in using ICT. Traditionally, older people, those less trained in using technologies or less educated in general, are seen as more intimidated, hostile and worried about computer use and are perceived as more likely to experience anxiety to computers, according to Beckers and colleagues [8]. Still, there is inconsistent evidence that age is a predictor for computer anxiety [9]. In a previous study [10], we found a potential explanation for the inconsistencies in studies that approached the relation between age and computer anxiety. The direct effect of age on computer anxiety was rather low, whereas the mediated effect of age through socio-economic status and computer experience was significantly higher, proving that the two predictors – socio-economic status and experience – could play a more important role in explaining individual differences in computer anxiety. Moreover, studies conducted with students [2] suggest a paradoxical situation: “the current generation of undergraduate students exhibit more psychological discomfort with computers than individuals who represent the previous generation in terms of exposure to computerization” (p. 221). This probably happens due to high social pressure for new generations of students to be continuously up to date with the latest technologies.

There are several estimates on the percentage of people that experience strong feelings of anxiety towards computer, on different age groups [11, 12]. Still we lack longitudinal studies and cross-cultural data. Moreover, computer anxiety could be experienced by everyone, depending on the context and situations that might trigger such feelings, or due to social pressure surrounding technology adoption.

In the current paper we argue that, instead of focusing on age as a predictor of computer anxiety and analyzing how feelings of anxiety are experienced by different age groups, we could focus on specific instances that trigger computer anxiety. We discuss instances which create feelings of discomfort, social embarrassment or the fear of looking inept, that negatively impact older people’s performance and willingness to try to use ICT.

1.2 Stereotype Threat and Computer Anxiety

The term “stereotype threat” was first used by Steele and Aronson [13] to describe a situation in which one feels at risk of confirming a negative stereotype about one’s own social group. Such instances appear when one views oneself in terms of salient group membership (e.g. “I am old and old people are not expected to be good at technology use, so using this application might be really difficult”). Such feelings and evaluations can undermine people’s performance, due to concerns about the possibility of confirming a negative stereotype. The stereotype threat was originally studied by Steele and Aronson [13] on African American students, by analyzing their performance on a standardized cognitive test, as compared to Caucasian students, when the situation was “powerful enough” [14] to trigger awareness of racial stereotypes. Subsequent studies conducted on different social groups proved that any individual is vulnerable to stereotypes threat in situations that increase the salience of group identity, as the group is presented in negative terms, relevant to the tasks [15]. Several studies found gender

differences in the performance of men and women, in situations where gender had been highlighted before the task completion. This influenced the performance of women on math tests [16, 17], and resulted in gender differences in social competence tasks [18], with men scoring lower than women. Similarly, students with a lower socio-economic status performed worse on cognitive tasks than children with a higher socio-economic status, when background differences were highlighted [19, 20]. And, similarly to the first quoted study, Caucasian men performed worse than Asian men on mathematics tasks, when racial aspects were triggered [21].

Stereotype threat is experienced as a state of psychological discomfort arising “when individuals are confronted with an evaluative situation, in which one’s group is associated with a negative stereotype” [22]. Therefore, “stereotype threat” impacts performance by raising individual anxiety level, when one becomes aware of the negative stereotypes [23].

We depart from an earlier observation made by Steele [24] concerning situational anxiety as a potential moderator of stereotype threat effect. It was suggested that stereotype threat effects could be noticed particularly in social anxiety situations [25]. More recently, experimental manipulations proved that, in stereotype threat situations, individuals experienced higher situational-specific anxiety, confirming the potential moderator role of situational anxiety in the way stereotype threat impacts performance. This was measured by psycho-physiological parameters: skin conductance, skin temperature, blood pressure – resulting, for example, in differences in cognitive efficiency. Overall, researchers agree that anxiety accompanies stereotype threat [26]. People facing stereotype threat reported higher levels of anxiety in relevant tasks, self-doubt and lower self-efficacy, negative expectations and lower motivations in pursuing the tasks.

In the current paper, we argue that stereotype threat in computer related tasks could raise computer anxiety and undermine individual performance or cause reluctance to technology. Moreover, we argue that this assumption is valid for the situation in which an individual is aware of belonging to a group that is negatively evaluated in terms of technology use, such as women or old people.

There are several studies investigating stereotype threat and computer performance on women [27], proving that the stereotype effect impacts women’s’ attribution of failure and success in computer related tasks; causing a gender gap in science, technology, engineering and mathematics (STEM) through self-perception of technology efficacy, technology anxiety and expectations about future performance in STEM education. Still, we lack studies to investigate the role of stereotype threat in acquiring ICT skills for older adults. Only one study the authors know of approached the topic of age-based stereotype threat and its effect on older adults’ performance in acquiring computer skills [28].

Nevertheless, the age-based groups have not been neglected in studies that investigate stereotype threat effect –see [29] for a review. Studies have focused on the way older adults underperformed on memory, cognitive and physical tasks, as result from age-based stereotype threat [30–32]. In fact, the meta-analysis of Lamont and colleagues [29] shows that age-based stereotype threat investigations have been conducted in four stereotyped performance domains: memory, cognitive, physical, and driving. The article [29] also included the study of Fritzsche et al. [28] to argue for a potential fifth domain

for age-based stereotype threat investigation: new skills acquisition. In this particular study, participants were trained to learn to use a new computer-based library system, being randomly assigned in a stereotype threat versus pacing condition, and then tested on the skills they acquired. Contrary to expectations, stereotype-threat was found to improve participants' performance both during training sessions and at the final test. Fritzsche and collaborators [28] argued that, contrary to similar studies in which performance testing occurred immediately following the stereotype threat conditions, in their study, training intervention happened in-between the treatment condition and performance testing. Nonetheless, here we argue that computer anxiety could be used to explain contradictory findings, as feeling of anxiety could moderate the effect of stereotype threat on performance. There are studies showing that a moderate level of computer anxiety, for example, has a positive impact on performance [33]. Beckers [34] discuss "the threshold effect", indicating that computer anxiety would hinder performance when it is severe and depending of some contextual factors – such as, for example, the ambiguity of the computer tasks, or the level of individuals' experience with that particular task.

2 The Present Study

The current study departs from the meta-analysis conducted by Lamont et al. [29] on age-based stereotype threat. We look for arguments that, in the case of studies regarding older adults and computer use, computer anxiety could be investigated as a moderator factor of stereotype threat on performance. In other words, we predict that stereotype threat situations would influence people performance in technology use to the extent to which such situations trigger high levels of computer anxiety. As previous studies have used experimental manipulations of age-based stereotypes, in the current study we use semi-structured interviews to explore older people's way of depicting "comfortable" and "uncomfortable" situations of technology use in everyday activities. We looked for specific cues regarding computer anxiety: such as the feelings of helplessness, unease, social embarrassment and tension, as well as for the way people overcome such feelings and describe their self-efficacy in handling computer tasks in everyday routine. The present study aims to describe instances which trigger age-based stereotype threat and subsequent computer anxiety for older individuals, and the potential impact on their technological self-efficacy.

Three characteristics are found by Lamont et al. [29] in their study to moderate age-based stereotype threat: (1) age, as for the young-old (60 to 65) the stereotypes seem to be less salient compared to old-older adults (65–70). Moreover, the age-based stereotype threat seems to be diminished on the 70 to 80 group; (2) gender – as ageing stereotypes are more self-relevant for women; (3) cultural and social-economic background, as the experience of being old or the self-relevance of ageing stereotype is different from a socio-cultural community to another. As a result, we approach these three criteria in our sample selection.

2.1 Method

We used semi-structured interviews to collect data and both authors conducted interviews with participants from two urban areas in Romania (Bucharest and Braşov). Semi-structured interviews were voice-recorded and then transcribed for further analysis. The interviewers took notes of participants' social economic status, age, gender, the number of devices they use and experience in using these devices. For the current paper we focus on participants' descriptions of uncomfortable situations when using ICT in daily life activities and we looked for specific signs of situation-based anxiety.

2.2 Participants

Participants were selected based on age, gender, and level of education. We conducted 12 interviews with people over 60 years of age in Bucharest (the largest city in Romania) and in Braşov (a medium-sized town in the west part of the country). The study is exploratory and focuses on urban areas, as the level of people over 60 having access to internet in rural areas is rather small (less than 2 %). Thus, we conducted 2 interviews per each category built from the combination of the three selection axes: gender (women, and men); age (60 to 65, and 66 and above) and education (medium – up to 8 classes and more, and high education-college graduation). Fieldwork was conducted in Romanian between October and December 2015.

2.3 Results

2.3.1 Instances Which Trigger Age-Based Stereotype

Participants showed awareness of age-related stereotypes regarding ICT use. Being faced with children or younger adults who present higher ICT skills is an instance that triggered awareness of belonging to the group of older adults that these stereotypes address:

“My friend told me one of her nieces said - she had asked something and the niece said: <<oh, why do you need to know that, Auntie, at your age!>> (...) Yes, I feel the younger generation has this attitude. This is my sensation and this is what I feel.” (Woman, higher education, 60, Braşov)¹

“Older people were not used to these instruments and especially not now, when the transition is so sudden, and so they are afraid. For the young, for young people, even from second grade they already know. My neighbor, when he started kindergarten, he had a tablet and was tapping on it and saying <<here is the teddy bear>>. He was half a meter tall”. (Male, higher education, 68, Braşov)

Some of the participants repeated the stereotype, stressing the fact that younger adults are the ones who possess knowledge about ICT and are the ones in charge of disseminating it to older adults:

¹ Own translation.

“Children are the ones who stimulate us with the mobile phones, how else would an old person know how to use them? Young people have made old people smart too.” (Woman, lower education, 71, Bucharest)

This participant seemed aware of the age-related ICT-use stereotype, already expecting that younger adults will be impatient regarding her needs to use technology:

“When I bought my speakers, I went to the shop one Friday evening, it was raining, and I told a young man who worked there, I said <<Listen, dear, are you patient? I want to buy something, but will you be patient with me?>>” (Woman, higher education, 60, Braşov)

When asked what they believe others think about individuals in their age group using ICT, answers revealed the participants’ awareness of the group stereotype threat:

“I think young people laugh about it: <<look at that old hag with a phone, or with such-and-such device>>”. (Woman, higher education, 60, Braşov)

“I think that, at a certain age, I mean when people are young, they do not understand why older people also want to do things, to use this and that... they think <<why does she need this?>>”. (Woman, higher education, 60, Braşov)

“Sometimes they say <<would you look at her, look what a phone she has, look at her using it, look what she’s learned>>. Things like that. When they see an older person they say <<look what she’s bought, looks like she had money>>” (Woman, medium education, 76, Bucharest). This participant mentions the effect of socio-economic status, which, correlated with older age, can act as a trigger of stereotype threat. This shows older adults in Romania are aware they are not expected to be able to afford new technologies.

“Some consider that we do not know enough.” (Woman, higher education, 60, Braşov)

Moreover, it could be argued that several participants had internalized these stereotypes and were now, in turn, replicating them in their answers when discussing themselves or, generally, people in their age group. For instance, a participant described being in the hospital and wanting to use a tablet, but being unable to:

“I couldn’t ask them for help with my tablet, they were old and sick people, and I don’t think they would have handled such things. (...) They wouldn’t know how to use them, because they’ve not had the opportunity to use them, they have no children, live alone.” (Woman, medium education, 76, Bucharest).

The participant reinforces the stereotype that younger adults are the ones who possess the knowledge about ICT use and that it is only through their dissemination of information that older adults could acquire these new skills:

“Older people are afraid to even hold such devices, because they don’t know how to work them. But they can slowly ease up, I’ve seen old people learn to use a computer when they are 55–60, well, the ones who aren’t afraid to.” (Male, higher education, 68, Braşov)

“For older people it is a handicap, for those who did not need to learn... you know younger people learn faster, for old people it is a handicap.” (Woman, higher education, 70, Braşov)

“I mean it’s a little difficult, well, one’s mind is not used to this new system, I mean, until you try it a little and then it grips you and you like it.” (Woman, higher education, 70, Braşov)

“Those who have managed to use them feel proud, but the others yearn to learn and the abilities of their mind do not help them anymore, the mind is lazier at a certain age, and there is nobody to help them, but I think on some level everyone would want it.” (Woman, higher education, 70, Braşov, medium sized town)

“One time, P. (son-in-law) even said I was an example: <<Look, C. uses Facebook, and my mother does not; C. uses so-and-so, my mother does not>>, so I thought I am keeping up pretty well, better than other people my age.” (Woman, higher education, 60, Braşov) – Even though the participant seems pleased with her own level of ICT skills, she also shows to be aware of the stereotype that other people in her own age group do not perform as well.

We also found that several of the individuals we interviewed brought up not only age-related stereotypes, but also gender stereotypes regarding ICT use. This could be relevant, as Romania is a society with rather traditional gender roles, where not only could there be an aged-based stereotype regarding use of ICT, but also a gender one, as it is assumed that men are more likely to be in charge of technology-related tasks in the family.

“Usually men our age know more, this is what I have seen and that is the way it was in my family too, if there was someone else to concentrate on it, then I let them do it.” (Woman, higher education, 60, Braşov)

“I was not used to it, you know, there was always my husband to handle these things and I did not overload my memory with these things if someone else could do it.” (Woman, higher education, 60, Braşov)

Talking about her mobile phone: “The first few times I used it it was easy because my husband knew how to and he taught me, otherwise, if it were up to me to do it myself... he took care of all my settings and put in all my contacts.” (Woman, higher education, 70, Braşov)

“My wife is afraid to use the TV receiver (i.e. a device that permits the reception of digital television), <<why work on the television and the receiver too>>? If her television is broken, I’m the one who fixes it, and so on. But that’s that.” (Man, higher education, 68, Braşov)

2.3.2 Computer Anxiety Cues

Participants described numerous situational anxiety cues in daily situations when they were aware of the age-based negative stereotypes.

“My children were discussing for a long time about buying me a tablet and I told them they were crazy. They joked about the fact that I will not be able to use it. And indeed I receive it for Christmas. I felt lost and I started to use it only when they were gone.” (Woman, medium education, 60, Bucharest)

“I try to keep up but it is very hard, it is very difficult. And when you get a new phone or so, you feel like you need a training course. It’s difficult, it’s difficult.” (Woman, higher education, 60, Braşov)

Therefore, new skills acquisition is quoted as a trigger of stereotype threat, consistent with the observations of Lamont and collaborators [29].

“The first one was the computer and I was so nervous. Now I have a laptop, but the first one was a computer, it also had a keyboard and I struggled to type. It was harder in the beginning, it was emotional, a psychological barrier.” (Woman, higher education, 60, Braşov)

One individual describes being in the hospital and having asked her granddaughter for the tablet. Being unable to use it triggered feelings of frustration: “I said give it to me, I could look over some games, because I was bored (...) and it wasn’t working, it didn’t work, it either wasn’t working well, or it worked for a bit and then stopped. I said take it away, I don’t want it anymore! It felt bad, because I was sorry, it would have taken up my time, helped me forget I was in hospital”. (Woman, medium education, 76, Bucharest)

The feelings of anxiety are more situational specific – as they tend to arise during first experiences with the device, usually in the presence of others of by comparison with others.

“Oh, very difficult. I am not very skilled with it [mobile phone] now either, but I can make calls and talk, that I’m able to do, to call someone. Otherwise, to look around it, well, I have grandchildren who can use the phone as though it were... I don’t know what; I have grandchildren who save me, because I cannot, I can’t figure it out, how to work it, what if I break something? Not that I don’t want to, if I broke one I could learn how to use it, to use it and look around it, but I don’t have the heart to, what if I break it? I am afraid, my grandchildren say <<you won’t break it, grandmother, press this key, and this one>> but it’s difficult”. (Woman, lower education, 71, Bucharest)

Discussing the use of computers by general practitioners, one participant discussed the anxiety her older adult doctor experienced, and the way her younger doctor views those who do not have ICT skills: “I noticed this with doctors too, our doctor was about ten years younger than me, not young-young, but he was not old and the poor man, it was torture for him at first, he said <<it’s driving me mad, I put in all my data and I made a mistake and it was an ordeal>>. Our current doctor, he has no problem with it, it’s natural to him, it was natural from the beginning and he said <<whoever can’t manage can just stay home>>”. (Women, higher education, 70, Braşov). This once more seems to reinforce the stereotype that older adults have a harder time using ICT and that younger adults believe those who are unable to use them efficiently might as well give up.

The way anxiety impacts performance and willingness to adopt ICT is described by most of the interviewees. The cues of anxiety are associated with reluctance, rejection or compliance:

“I don’t need anything too sophisticated, to be honest, I get confused trying to use it. I know that if you get used to it, it is not that difficult. It was easier with the laptop because I had used a computer at work, but I still have problems now, if I get stuck I need someone to come and help me (...) I can’t say I feel fully in control now either, but I manage with the things I need, I only use it to write.” (Woman, higher education, 70, Braşov)

“Last year I accidentally erased all the data on my old phone, when I got this new one, then I was very upset, and I had to learn how to save my files, but I still don’t know how to and I keep postponing, I should at least save them online, I lost all the pictures from my old house, I was sorry about the pictures, of spring, summer, colors, leaves, so all the memories gone”. (Woman, higher education, 60, Braşov)

3 Discussion and Conclusion

In the current study we investigated the role of stereotype threat in triggering computer anxiety for older individuals. By means of semi-structured interviews with people aged 60 and above, we revealed instances which create feelings of discomfort, social embarrassment, when individuals were aware of negative stereotypes about their age group in relation to the use of ICT. We start from the assumption that fear of negative evaluation can undermine people’s performance, due to concerns about the possibility of confirming a negative stereotype. We looked for cues of such feelings and instances that could trigger computer anxiety in the way older people describe the ICT use in daily routine.

The results show situation-specific anxiety arises when older people faced children or younger adults who possess higher ICT skills. Older people depicted such instances as triggering awareness of being a member of the group with a negative stereotype. Such instances also seem to create reluctance and alienation from technology. As a result, they feel less willing to have initiative in using particular devices, considering it is the role of younger people to disseminate the information. Older people perceived themselves more as “objects” than “subjects” of the information regarding technology and they depicted the younger people as impatient and sarcastic in such situations. As a result, more feelings of awkwardness, social embarrassment and ineptitude arise triggering withdrawal and decreased interest in new communication technology.

The results of the interviews indicate that contextual factors should also be considered, whenever we have contradictory findings of the relation between computer anxiety and performance in older individuals. We argue that when the situation is “powerful enough” to increase older people’s awareness of the negative stereotypes associated to their group in relation to technology, this would increase computer anxiety and could have a negative influence of technology appropriation and performance. We noticed that during our data collection, the interviews conducted by the second author of the paper (younger author) managed to collect more information on cues of anxiety towards ICT than the second author, possibly due to the same effect of stereotype threat. Although a limit of the current research procedure, this could also be considered another indicator that the stereotype threat phenomenon can be activated through subtle contextual cues that sometimes we are not aware of.

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