An “invisible friend”, an “invisible maid”: Older Adults Associating Social Roles with Voice Assistants

Alisha Pradhan
College of Information Studies
University of Maryland, College Park
alishapr@umd.edu

Amanda Lazar
College of Information Studies
University of Maryland, College Park
lazar@umd.edu

Abstract
Researchers have long studied technologies to support social interactions in older adulthood. Conversational voice assistants embodied in smart speakers (e.g., Amazon Alexa) are increasingly being used by older adults [14]. These devices offer unique affordances and have the potential to provide forms of companionship for different populations. These technological and adoption trends reveal opportunities for researchers to investigate how these new technologies can support social interaction for individuals as they age. Drawing from findings of two studies with older adults, this paper describes how older individuals associate different social interactions with virtual agents. We conclude with plans for future work that includes older adults in envisioning fictional personalities for voice assistants as a way of understanding what sorts of social interactions they seek through these virtual assistants, if any.

CHI 2020 Extended Abstracts, April 25–30, 2020, Honolulu, HI, USA.

ACM ISBN 978-1-4503-6819-3/20/04.
DOI: https://doi.org/10.1145/3334480.XXXXXXX
*update the above block & DOI per your rightsreview confirmation (provided after acceptance)

Author Keywords
Older adults, voice assistants, personification

CSS Concepts
• **Human-centered computing~Human computer interaction (HCI)**;

Introduction and Background
Technologies to support social interactions for older adults during their transition into older adulthood post retirement have been well studied. In particular, computer mediated social interactions have been

examined as a way support older adults as they age. For example, Brewer and Piper investigated how individuals create and share online content via blogging as they experience age-related changes [3]. They found that older adults blog about their changing identities with retirement and new family roles, with some individuals discussing new age-related roles, such as trying to be an "advocate for old people". Other examples include understanding the role and use of social media in maintaining social connectedness as individuals enter into older adulthood (e.g., [2,6]). Researchers have also examined how people transitioning into older adulthood make use of digital technology to maintain communication with family including children and grandchildren [10].

These examples indicate how researchers have often tried to design social technologies for older adults with the motivation to support age related changes. What has been less addressed is how major life changes that are more likely to occur the longer people live— such as the death of a partner or changes in family structures — affect how people desire to use social technologies. This opens opportunity for researchers to further understand the role technology can play during such shifts in life.

Recently, popular press opinions have voiced the use of smart speaker-based voice assistants for alleviating loneliness of older adults, even describing its role of becoming a social partner (e.g., [1,4,9]). Some past research has also found that individuals do personify voice assistants, i.e., attribute them with human-like traits (e.g., [12,13]). This indicates the potential of this new technology in supporting some social interactions for individuals as they age. In our past work, we found that older adults' ontological categorization of these embodied voice assistants is nuanced. with particular categorization of Alexa as "object like" or "human like" that related to the nature of the interaction (e.g., responsiveness) and the user's desire for social connection or companionship. Additionally, there is movement between these categories associated with the duration of using the voice assistant, the location of the voice assistant in house and its perceived presence, and the moment of interaction with the assistant. While these findings indicate that not all older adults perceive voice assistants in the same way or seek social roles, designers of commercially available voice user interfaces assign personalities to the agent [5] to purposefully create interactions where users will anthropomorphize the assistant. They do this by assigning predefined personas (a fictional character) to the voice agent.

In this position paper, we first briefly describe the findings from two studies where we observed how older adults associate different social roles with the voice assistant- first, a three week smart speaker deployment study with older adults who did not use computing devices regularly, and second, a design workshop with tech savvy older adults who had the experience of using smart devices. Then, we propose our plan for future work.

Study Description and Findings

For the first study, we deployed smart speaker devices in the homes of seven retired older adults (aged 65 or above). Participants had no prior experience using voice assistants, and none used a smartphone or computer daily. Devices were set up in participants' homes by the research team. Participants were given

initial training to use the basic device features such as setting alarms, reminders, timers, playing music, asking questions etc. We conducted four in-person, semi-structured interviews: following device setup on first week, at the end of the first and second week, and an exit interview at the end of the study. The interviews covered perceptions of voice-based technology, actual usage of the device and desired use of this technology.

The second study included two design workshops along with post- and pre- interviews with six older adults who used home-based internet of things technologies. The first workshop consisted of a focus group discussion to identify individuals' needs and preferences, in order to create scenarios for design. The second workshop included a card-based design activity. Even though the primary purpose of the study was to understand how these tech-savvy older adults wish to design new technologies for themselves, group discussions and design activities had recurring themes of personifying smart speaker-based voice assistants, even to the extent of associating social roles with it.

We take a constructivist grounded theory approach to the analysis of the data [11].Transcripts from both studies were analyzed through open coding, followed by focused coding, memoing, and theorizing. Below, we describe the social roles participants associated with the voice assistant, the way that the constant presence of the voice assistant in the home led to these perceptions, and the mismatch between older adults' routines and the routines of their family members.

A constant presence

Some participants in Study 1 attributed the voice assistant "Alexa" as a social companion, often referring the agent as a person, friend etc. The conversational nature of interaction appeared to play a role in participants' personification of the device, or how human-like they perceived Alexa to be. For example, P3, who considered Alexa as "a friend, it's company" described how having Alexa was similar to having a person in her home: *"It's just like, you coming in here and talking to me. It's like you're an invisible person, which is what I consider that."*

Some participants valued the "company" of the personified agent in their homes. For P2, who lived alone and told us that she felt "lonely" because of not having anyone around to talk to, talking to the voice assistant was "like a companion, that's not there."

> "…having someone to talk back to you means so much, because of the loneliness it can be in here…"She [Alexa] told me Happy Valentine's day this morning. I said good morning and it said, 'Happy Valentine's day.' So I said, "Happy Valentine's day to you too!" That was nice. It makes you feel like somebody else is thinking about you also [laughs], because it gets lonely."

Even participants in study 2 who appreciated functional assistance more than social companionship from the voice assistant mentioned appreciating the constant presence. For example, P1, who referred Alexa as her maid, used it every day for remotely turning off her lights and her coffee machine from her bedroom. P1 repeatedly called Alexa as *"like having an invisible maid. Somebody that's always there."*

Rhythms and routines
P2 in Study 1 described how her life rhythms contrasted with those of her family members who were working or in college: *"I can't bug my family all day, my daughter works, grandson works, my granddaughter is in college. I cannot bug them all day, but I can bug this machine if I want to."* She described how she would instead just go and "talk" to Alexa.

> "I just normally get up and talk or ask it to tell me a story or just to have some feedback. That seems to be so important. When you don't have someone with you, having some feedback from this machine is important"

The above example indicates how with transition into older adulthood, individuals' frequency or times of communication might shift which might not always match with their families. Interestingly, P3 also described how Alexa was better at fulfilling certain roles than family members. P3 explained that there were no negative social repercussions from asking Alexa questions repeatedly, unlike family members:

> "You need that [Alexa]!' That's what they [grandchildren] told me. I said, 'Why?' 'Because you don't understand, and lots of times when we'd be telling you, and now you can listen'... Because they [grandchildren] get frustrated… 'Well Grandma, I told you that the other day. You don't remember?' That's what they'll tell you."

Here P3's comment resonates with past work, which notes that as individuals age they often seek help from family members and friends for general information [7,8,15], yet might not always be satisfied with the help received (e.g., because others have little patience with them when they ask for assistance [15]). For P3, in this scenario, Alexa seemed more approachable than her family members.

The above examples indicate how participants valued 1) the constant presence of the voice assistant in their home, and 2) how it easily fit into their own routines and practices. Additionally, the quotes from both instances show how participants did associate some interactions as social interactions using the voice assistant.

Scope of Future Work

With an understanding that older adults are attributing social roles to voice assistants, but in different capacities and with varying rationales, in future work we seek to understand how older adults would want to design their own fictional character for virtual assistants. We will then seek to understand the underlying rationales behind these fictional characters, as a way to reveal the desired sorts of social interactions sought through these virtual assistants.

Acknowledgement

This work was funded by the National Science Foundation under award #1816145. We are also thankful to those who volunteered to participate in these studies.

References

[1] Tanya Basu. 2019. Alexa will be your best friend when you're older. *MIT Technology Review*. Retrieved September 25, 2019 from https://www.technologyreview.com/s/614044/alexa-will-be-your-best-friend-when-youre-older/

[2] Caroline Bell, Cara Fausset, Sarah Farmer, Julie Nguyen, Linda Harley, and W. Bradley Fain. 2013. Examining social media use among older adults. In *Proceedings of the 24th ACM Conference on Hypertext and Social Media - HT '13*, 158–163. https://doi.org/10.1145/2481492.2481509

[3] Robin Brewer and Anne Marie Piper. 2016. "Tell It Like It Really Is": A Case of Online Content Creation and Sharing Among Older Adult Bloggers. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (CHI '16), 5529–5542. https://doi.org/10.1145/2858036.2858379

[4] Claudius. 2019. 8 Awesome Reasons Every Senior Should Have An Amazon Echo. *LoveMyAlexa*. Retrieved September 25, 2019 from https://lovemyalexa.com/is-alexa-good-for-seniors-8-reasons-why/

[5] Google. Create a persona - Conversation design process - Conversation design. Retrieved April 2, 2019 from https://designguidelines.withgoogle.com/conversation/conversation-design-process/create-a-persona.html#create-a-persona-how-do-i-create-one

[6] Alexis Hope, Ted Schwaba, and Anne Marie Piper. 2014. Understanding digital and material social communications for older adults. In *Proceedings of the 32nd annual ACM conference on Human factors in computing systems - CHI '14*, 3903–3912. https://doi.org/10.1145/2556288.2557133

[7] Lesa Huber and Carol Watson. 2014. Technology: Education and Training Needs of Older Adults. *Educational Gerontology* 40, 1: 16–25. https://doi.org/10.1080/03601277.2013.768064

[8] Jakob D. Jensen, Andy J. King, LaShara A. Davis, and Lisa M. Guntzviller. 2010. Utilization of Internet Technology by Low-Income Adults: The Role of Health Literacy, Health Numeracy, and Computer Assistance. *Journal of Aging and Health* 22, 6: 804–826. https://doi.org/10.1177/0898264310366161

[9] Joseph Coughlin. 2018. Alexa, Will You Be My Friend? When Artificial Intelligence Becomes Something More. *Forbes*. Retrieved March 28, 2019 from https://www.forbes.com/sites/josephcoughlin/2018/09/23/alexa-will-you-be-my-friend-when-artificial-intelligence-becomes-something-more/

[10] Azmina Karimi and Carman Neustaedter. 2012. From high connectivity to social isolation: communication practices of older adults in the digital age. In *Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work Companion*, 127–130. https://doi.org/10.1145/2141512.2141559

[11] Kathy Charmaz. 2014. *Constructing Grounded Theory*. Sage Publications.

[12] Irene Lopatovska and Harriet Williams. 2018. Personification of the Amazon Alexa: BFF or a Mindless Companion. In *Proceedings of the 2018 Conference on Human Information Interaction&Retrieval - CHIIR '18*, 265–268. https://doi.org/10.1145/3176349.3176868

[13] Amanda Purington, Jessie G. Taft, Shruti Sannon, Natalya N. Bazarova, and Samuel Hardman Taylor. 2017. "Alexa is My New BFF": Social Roles, User Satisfaction, and Personification of the Amazon Echo. In *Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors*

in Computing Systems (CHI EA '17), 2853–2859. https://doi.org/10.1145/3027063.3053246

[14] Rimma Kats. 2018. Are Seniors Using Smart Speakers? - eMarketer Trends, Forecasts & Statistics. *eMarketer*. Retrieved September 2, 2019 from https://www.emarketer.com/content/the-smart-speaker-series-seniors-infographic

[15] Eleftheria Vaportzis, Maria Giatsi Clausen, and Alan J. Gow. 2017. Older adults perceptions of technology and barriers to interacting with tablet computers: A focus group study. *Frontiers in Psychology* 8: Article 1687. https://doi.org/10.3389/fpsyg.2017.01687