Designing Credible Conversational Voice Interfaces for Older Adults

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ABSTRACT

Conversational voice interaction supported by commercially available voice assistants embodied in smart speakers (e.g., Amazon Echo, Google Home) enable non-visual interaction that does not require extensive expertise with traditional mobile or desktop computers, thus offering new possibilities of access to digital technology. As such, these technologies are increasingly being used by older adults, particularly to find online information. But, do older adults perceive this information obtained through voice assistants as credible? In this position paper, we discuss preliminary findings from our ongoing work on understanding older individuals' perception regarding the credibility of their voice assistant. Our findings show that older adults are likely to perceive the information obtained through voice assistants as credible. This perception could be concerning as past research indicates that older adults are likely to use these voice assistants for finding health information. We discuss opportunities for designing conversational voice-only technologies to provide credible online information.

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KEYWORDS

Older adults; conversational voice assistants; credibility

INTRODUCTION AND BACKGROUND

Conversational voice assistants such as Alexa, Google Assistant or Siri, are having an increasing presence in many older individuals' daily lives [8]. The voice assistants embodied in smart speakers such as Amazon Echo and Google Home offer conversational voice-only interaction, thus presenting new affordances as compared to traditional computers or touchscreen mobile devices.

Past work on older adults' use of voice interaction paired with graphical interfaces sheds light on how individuals deem it as easy to use [4] and prefer the speed of voice interaction over typing [12]. Research also suggests that voice-based interaction can increase the overall confidence of using technology for some older individuals [9]. These findings are also corroborated in emerging research on commercially available conversational voice interfaces such as Amazon Echo or Google Home. Preliminary research in this space indicates how older adults are overall positive about using voice interaction supported by smart speakers, primarily due to its ease and convenience of use and enabling easy access to digital technology [5,7].

As such, researchers in the HCI community are beginning to investigate how older adults make use of these voice enabled smart speakers in their home [6,7], their perceptions of these devices in general [5], or their perception around privacy aspects of using voice assistants, including the trustworthiness and transparency of these AI systems [1]. In addition to concerns around privacy and security aspects of these voice assistants, the credibility and the quality of information obtained through these voice assistants is also becoming questionable [13]. Related to this thread of research, in this work, we present findings from an ongoing study on understanding older adults' perception of how credible voice assistants are.

METHOD

As a part of a larger study on understanding older adults' perception of interaction with voice assistants, we conducted a survey. Our participants include twelve individuals 65 years old or above. All participants, except for P8 (who used Google Home) owned and used an Alexa. All participants mentioned using their voice assistant for finding information on the internet.

In the survey, we asked participants: how well does the term “credible” describe the voice assistant they used. Participants rated their perception of the voice assistant’s credibility on a five point Likert scale ranging between very well (scored as 5) to very poorly (scored as 1).

The survey was moderated, i.e., a researcher was present when the survey was administered. This allowed us to collect qualitative data as well. Seven participants completed the survey with the researcher being present in-person. Other participants completed the survey online over a zoom call. As participants filled out the survey we asked them to “think aloud”, and share their thoughts about their voice assistant being (or not being) credible. In the sections below, we describe the findings from this preliminary work and the implications of our findings.

FINDINGS

Our findings indicate that participants largely perceived the voice assistant to be credible (mean= 4.08, SD= 0.79).

The interviews helped us further understand why individuals perceived the assistant as credible or not. Most participants described that the voice assistant is “believable”, and that they *“can trust that”* [P3], “*because it’s the internet*” [P4]. Similar to P4, some other participants also described how they trusted the source of the information, as P10 below describes:

> “Credible, I'd say well. I tend to think it's quite credible. I don't think I'm being gullible about it. I think it has... It's like I trust Wikipedia. I trust some online resources. I just feel that it probably has... it's been around for a while and I feel it's probably correct and the information it's giving me for the most part. I trust it, I guess.”

P11 also trusted her Alexa saying “*whatever sources they're using are valid ones.”* [P11]. While most participants perceived that their voice assistant’s source of information is credible, two participants questioned the information provided by their voice assistant and would use that information as a starting point to look further as P9 described:

> “anything can be based on the information that it's working from. And I think, again, based on that, I wouldn't bet a great amount of money on anything I got off of Alexa, but I would feel secure what to look further” [P9]

Although P9 questioned the information provided by her voice assistant, on the survey, she gave a high score (marked “well”, corresponding to numeric score of 4). Similar to P9, P12 mentioned that he thinks the information from the voice assistant is *“fairly credible*” and he would not *“take them as a gospel”*, and on the survey gave a neutral score (marked “neutral”, corresponding to numeric score of 3).

Overall, our preliminary findings with 12 older adults shows that most participants perceived their voice assistants to be credible and believed the information provided by their voice assistant.

IMPLICATIONS FOR DESIGNING CONVERSATIONAL VOICE ASSISTANTS

The fact that older adults are likely to trust the information they receive from voice assistants, as indicated by our preliminary findings is jarring. This is because recent research indicates that older adults use smart speaker-based voice assistants frequently to search for online information, especially health information [7]. As older adults are increasing using smart speaker-based voice assistants to find online information, we need to attune to our practices to ensure credibility of information on these voice-only interfaces. Unlike visual search interfaces, for a particular query, voice-only interfaces (such as Alexa on Amazon Echo) do not provide multiple information sources or contextual data (including page layouts, popups, advertisements, etc.) associated with a web page. This contextual data, at times, is helpful for users to discern the trustworthiness of information on a website [2,11]. Hence, for voice interfaces, assessing the credibility of an information source might not be that straightforward. Even though some voice assistants currently reveal the source of information (e.g., Mayo Clinic, WebMD), these sources often go unheard (as in the case of voice user interfaces) and hence might not be enough to address the issue of information credibility.

One approach to this issue could be to steer people toward better sources. To do so, credibility scores can be assigned to different webpages (i.e., the information sources). Credibility scores can be assigned by taking into account different webpage features such as website's overall popularity, number of ads, awards (e.g., HON awards for health websites) [10]. These credibility scores can be returned to the user along with the query result. Another area that requires attention to ensure credible information include the audit instruments for assessing information quality in smart speakers. Emerging research on evaluating smart speakers' for information quality (e.g., [3]), would be a fruitful direction for future research.

CONCLUSION

In this work we present preliminary findings on older adults' perception of voice assistants' credibility. Preliminary results indicate that most older adults perceive the information obtained through voice assistants as credible. This perception of credibility could be concerning as past research indicates that older adults are likely to use these voice assistants for finding health information. We discuss opportunities for designing voice technologies to provide credible online information.

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