Whoever Controls the Media, Controls the VUI

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ABSTRACT

Older adults (OAs) form the fastest growing user group of voice user interfaces (VUIs). VUIs hold promise for OAs in terms of usability and convenience. However, OAs' perceptions of VUIs can be influenced by the messages about and portrayals of technology they receive from mass media. This in turn can impact their adoption and the extent of the benefit they can derive from VUIs. In this paper, we present a preliminary analysis of the mass media articles published by AARP, a leading organization aimed at empowering adults aged 50 and up, on the topic of VUI. We use inductive thematic analysis to find the themes of the selected articles. Through this, we aim to gain a better understanding of VUIs' perceived value and utility for OAs as portrayed in media, and the implications of this portrayal on the possible strategies for increasing VUI adoption by OAs.

CCS CONCEPTS

• **Human-centered computing → Natural language interfaces**; *HCI design and evaluation methods*

KEYWORDS

Voice User Interface, Older Adults, Mass Media, Sociotechnical

1 INTRODUCTION

Voice user interfaces (VUIs) allow people to communicate with a system using voice or speech as input and output. Older adults, who we define as those ages 65 or older, form the world's fastest growing age group of VUIs [14]. This may be in part due to VUIs' ease-of-use for OAs compared to graphical interfaces, which in contrast may pose visual, auditory, physical, and motor-based barriers to interaction [20, 21]. However, adoption of VUIs is not without its challenges. In particular, mass media influences users' perceptions and behavior with respect to new technologies. This in turn can contribute to the adoption (or lack

of adoption) of such technologies [22]. Older adults also rely heavily on the media to acquire their knowledge about technology [7]. We wanted to understand what issues relevant to OAs and VUIs are communicated by mass media. As such, we are in the process of establishing a long-term project to analyze articles from major news sources for older adults in the United States of America and Canada.

In this paper, we report our preliminary analysis in which we investigated the articles on VUIs that were published by the AARP (aarp.org; formerly known as the American Association of Retired Persons, but is now simply known as AARP). AARP is a leading United States-based organization aimed at empowering adults aged 50 and up. Notably, AARP is a supporter of VUIs, having three existing Alexa skills for its audience base ("Memory Game", "Now Flash Briefing", and "Raise Your Voice" [2]). We consider articles on VUI by AARP to be influential for OAs and a valuable subject of study. In the future, we hope to compare these findings with that of academic studies of older adults' perceptions of VUIs and VUIs' benefit to older adults. We plan to rely on the analysis by Stigall et al. [19], which is a preliminary investigation of the computing literature on this topic.

2 METHODS

We used a Google Chrome browser set to "Guest" mode to prevent any side effects that search history may have on the results generated. We searched on Google (google.com) for the AARP articles by using the following search query:

> site:aarp.org ("voice user interface" OR "VUI" OR "conversational agent" OR "conversational interface" OR "conversation agent" OR "chatbot" OR "alexa" OR "google home" OR "siri" OR "cortana" OR "voice assistant" OR "virtual agent" OR "interactive voice response" OR "IVR") AND ("older Adult" OR "senior" OR "aging" OR "ageing" OR "elderly")

In effect, this query produced results that mentioned both VUIs and older adults. This search query was designed to parallel the search query used by Stigall et al. in [19], however with search terms added or removed to match common-use language (e.g. by including commercial VUIs like Alexa). We filtered for results from September 20, 2018, to February, 1, 2020. The aim of selecting such dates as delimiters was to find articles that are both relevant and current would peak starting from the date of significant events related to VUIs, which in this case is the date of the announcement of the 3rd generation of the Amazon Echo Dot. We limited the article selection to the first five pages of Google search results. To filter results, we used the process suggested by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [12]. We screened out
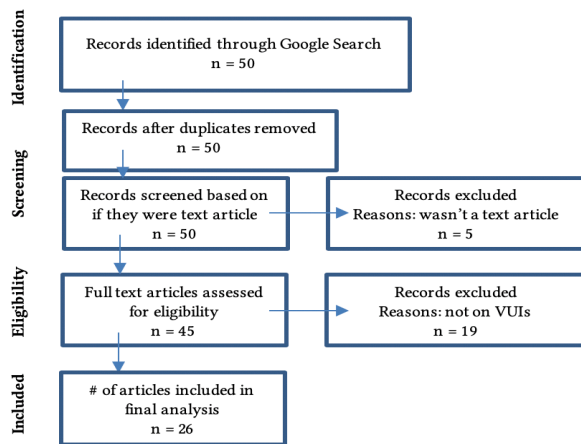
Figure 1: Flow Diagram for Article Selection

articles that were not text-based (i.e. some were landing pages or video reports) or were not on VUIs (see Figure 1). All of AARP's articles were written by AARP technology bloggers or were AARP's official publications or manuals.

3 RESULTS

Inductive thematic analysis, as developed by Braun & Clarke [8], was used generate based on the content of the articles initial codes that were clustered into secondary codes for better categorization and abstraction. Finally, the secondary codes were used to identify overarching, high-level themes (see Figure 2). For this preliminary analysis, we had one coder (the primary author) in the process. The three themes that emerged suggest a narrative that OAs would derive the most benefit out of using VUIs to live well (Theme 1), are willing to acquire and use VUIs (Theme 2), and would not find them difficult to use (Theme 3).

Theme 1 covers the common thread across many of the articles, which was that the OAs want to age in place (remain in their own homes rather than move to a long-term care home) and do so independently (without extensive social support). As such, they have a network of digital services (Spotify and Apple Music were mentioned frequently [14,18]), family, information sources, other devices, and society (e.g. through civic engagement [3,9]) with which they want and are encouraged to remain connected. The VUI device would serve as an always-on or always-available librarian [17] or digital butler [14] to interface with their networks. VUIs can connect to cars [5,6], for example to start them, and smart home devices [11,15,18], for functions like checking the status of the garage door, turning on and off lights, playing ambient music, and controlling the microwave [10]. These functions provide OA with added convenience and a way around mobility issues.

Theme 2 bridges Themes 1 and 3 by connecting OAs' needs with and the capabilities of VUIs through OAs' perceptions. OAs often experience a "box problem" where they purchase gadgets that are never opened or have been tried and abandoned because the gadgets do not fully suit their needs. This suggests that OA are more than willing to try new technology but having them adopt it may be the greater challenge. Some of the articles are more critical about VUIs but remain positive about these devices. For instance, some of these remind OAs that VUIs are not very
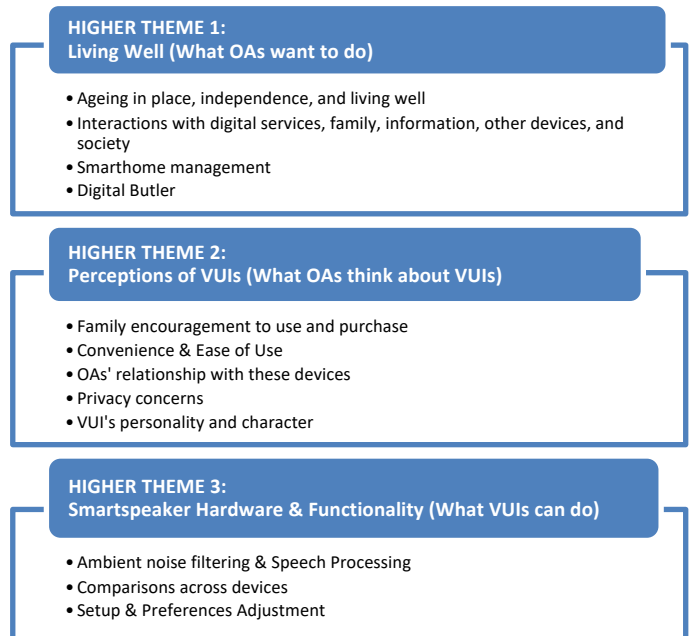

Figure 2 High-level themes and secondary codes from inductive thematic analysis of articles from AARP

smart and that the OAs have to work with the VUIs [14,15]. As another example, issues of privacy as well as instructions on how to protect it are covered in several articles [1,13,15].

Theme 3 relates largely to the technical components of VUIs. Setup is not considered to be difficult [15]. However, OAs are warned about a few caveats to keep in mind when using VUIs. As examples, OAs are encouraged to find a quiet place for their VUIs [16], to speak clearly when using them [17], and to be mindful of their accents [15]. VUIs' form factors are considerations to make when deciding which to get; smaller devices like the Amazon Echo Dot and Google Home Mini are fit for smaller rooms because they don't take up a lot of space and their speakers are not very powerful [18].

4 DISCUSSION AND CONCLUSION

Our preliminary results suggests that the primary value VUIs provide for OAs is the opportunity to live independently yet remain connected with society. This is the messaging that the media, or at least AARP, seems to want to communicate to OAs. The media supports OAs' use of VUIs, even going so far as to say they are easy for OAs to set up and use. This suggests that technologists concerned about increasing adoption of VUIs by OAs must not only concern themselves with the usability of VUIs, but they should also make sure to communicate the power of VUIs to help OAs remain independent yet also connected to society. We ground these preliminary insights in an initial analysis of the mass media side of VUIs. Together with the work by [19], one can begin to piece a larger picture of OAs' perceptions of VUIs and understand how to influence their adoption of this technology.

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