

"I Want to Continue the Conversation, But She's Gone": The Gap Between Transactional Utility and Social Companionship in VHA Adoption by Older Adults

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ABSTRACT

As conversational AI becomes ubiquitous, Virtual Home Assistants (VHAs) are increasingly deployed to support aging-in-place. While the functional utility of these devices is well-documented, their potential to mitigate loneliness among older adults remains contested. This paper presents findings from an eight-week qualitative study examining the domestication of Amazon Echo Dots by older adults living alone. Through post-deployment interviews, we investigate how participants negotiate the device's utility, social presence, and role in their daily lives. Our findings reveal a complex trajectory of adoption: while participants successfully integrated the VHA as a critical tool for Instrumental Activities of Daily Living (IADLs) and safety (e.g., environmental control for fall prevention), they largely rejected it as a direct remedy for loneliness. Instead of functioning as a companion, the device acted as an asocial proxy, facilitating connections to the outside world while failing to sustain the reciprocal, multi-turn dialogue required for genuine social bonding. We identify a learning runway heavily dependent on intergenerational scaffolding and highlight an interaction gap where the lack of conversational context fractures the illusion of social presence. We contribute a nuanced understanding of how older adults perceive AI companionship, arguing that future designs must prioritize phatic communication and proactive engagement to bridge the gap between transactional utility and emotional support. These insights offer critical design implications for developing age-inclusive conversational interfaces that move beyond command-and-control models to support the psycho-social well-being of older adults.

CCS CONCEPTS

• Human-centered computing • Empirical studies in HCI

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1 Introduction

The global population is aging rapidly, a demographic shift often referred to as the "Silver Tsunami." As the desire to age in place remains a priority for this demographic, the challenges of functional decline and social isolation have become critical public health concerns. Loneliness has been identified as a significant risk factor for mortality, comparable to smoking 15 cigarettes a day, and is strongly linked to increased risks of dementia, heart disease, and depression [1][2].

In response to these challenges, consumer technology, specifically voice-activated Virtual Home Assistants (VHAs) like Amazon Echo and Google Nest, has been heralded as a potential solution. These devices offer hands-free interaction, seemingly bypassing the dexterity and visual acuity barriers associated with touchscreens [3]. Thus, researchers and developers have hypothesized that VHAs could serve as virtual companions that can offer not just utilitarian support for Instrumental Activities of Daily Living (IADLs), but also a social presence to mitigate the silence of living alone [4].

However, the domestication of VHAs by older adults who are often characterized as digital immigrants remains a complex, non-linear process. While adoption rates of smart speakers are rising, the gap between the promise of AI companionship and the reality of daily use for older adults warrants rigorous investigation.

Existing literature offers mixed evidence. While some studies suggest VHAs can reduce feelings of loneliness through cognitive engagement and routine management [3], others highlight significant barriers including privacy concerns, lack of command literacy, and the inability of current Natural Language Processing models to sustain meaningful, multi-turn dialogue [5][6].

This paper presents the findings of an eight-week qualitative study investigating the deployment of Amazon Echo Dots in the homes of 13 older adults living alone. We examined how this demographic negotiated the utility and sociality of conversational agents. Our research moved beyond simple usage metrics to explore the sociotechnical scaffolding for sustaining engagement.

2 Related Work

Living alone or in institutional settings, physical or sensory decline, chronic health issues, limited mobility, and the loss of loved ones have been found to increase the risk of loneliness among older adults [2][7]. Thus, older adults often found it difficult to maintain meaningful relationships that support emotional well-being, potentially impacting their health due to a higher risk of heart disease, stroke, dementia, depression, anxiety, and premature death [7]. A recent national survey conducted in the U.S. revealed that about 37% of adults between 50 and 80 reported feeling lonely, and 34% reported social isolation [7]. Therefore addressing loneliness and social isolation is a key step in supporting healthy aging [2].

The rise of conversational agents, particularly VHAs like Amazon Echo and Google Nest, presents a compelling opportunity and challenge for Human-Computer Interaction (HCI) researchers seeking to address issues of social isolation and loneliness, particularly within the aging population. This related work reviews existing literature on AI-based companionship, empirical studies on VHA deployment in older adult populations, and the established barriers to adoption in gerontechnology.

2.1 Conversational Agents and Companionship

Research has long explored the use of technology to support the well-being and independence of older adults, with significant focus recently placed on social robots and VHAs as anti-loneliness interventions [8]. Although the literature presents mixed evidence regarding the efficacy of purely technological companionship, prior research showed that social robots and other AI-based companions could help reduce loneliness and improve emotional well-being in older adults [9][10].

Recently, several systematic reviews of AI-based tools to combat loneliness found that social robots were the most promising of all the technologies studied [9] [11] [12]. Social robots, such as Paro, Pepper, and BOCCO emo, which offer physical presence and embodied interaction, have shown some success in reducing stress and improving mood in institutionalized settings [10][13][14][15]. Some older adults even considered the robot as a friend, or even a grandchild, especially when the robot could hold back-and-forth conversations. This emotional connection helped reduce feelings of social loneliness [11]. Many of these robots use features like speech recognition and emotion detection to make conversations feel more

personal [12]. However social robots are costly, making it financially straining for older adults.

2.2 VHA Use by Older Adults

VHAs are easily accessible nowadays and much more affordable than robots. Studies deploying VHAs in the homes of older adults find that the primary value is in Instrumental Activities of Daily Living (IADLs) support, such as reminders, information access, and safety controls, rather than affective companionship [16][17]. While VHAs can indirectly alleviate isolation by facilitating connection (e.g., simplifying calls to family) [18], participants frequently report that the device is merely a "tool" or "gadget," a sentiment echoing the findings in the present study (P11). Further work emphasizes the importance of proactive engagement by the AI, suggesting that passive agents are less effective in sustaining long-term relational use compared to systems that initiate conversations or offer relevant, context-aware support [19][20]. This points toward the need for future VHA designs to incorporate affective computing principles to interpret user tone and context, thereby enabling more empathetic and relevant responses [21].

In fact, the utility of VHAs often relies on the Media Equation theory, which posits that humans instinctively treat media and technology as social entities [14][22]. While this forms the basis for expecting users to engage socially with an AI, the reality of current VHA capabilities introduces significant friction. Studies have consistently demonstrated that while users will humanize agents, the sense of companionship is fragile and this fragility is often linked to the core design of Conversational User Interfaces (CUIs) [23][24].

Most commercial VHAs operate on a command-response architecture, designed for transactional efficiency (e.g., setting a timer, playing music) rather than relational depth [25][26]. Critiques highlight the failure of these systems to support phatic communication, such as the social pleasantries and filler words essential for maintaining natural human dialogue, or to retain context across multiple turns and sessions, resulting in conversational collapse [5][6]. For older adults, the rejection of a VHA as a companion often stems from this failure to sustain meaningful, reciprocal conversation, confirming the gap between perceived instrumental utility and actual emotional value [27][28]. The lack of sustained context is a known challenge that undermines the perception of the VHA as an attentive and engaged listener, which however is a critical factor for mitigating loneliness [29].

2.3 Adoption Barriers and Social Scaffolding

Successful VHA integration among older adults is heavily mediated by factors related to digital literacy, perceived ease of use, and social influence, which act as barriers to full adoption [30]. While the Technology Acceptance Model remains relevant, it is often insufficient to capture the complexities of VHA use in this demographic [31]. Barriers specific to older adults include a higher cognitive load associated with learning new command syntax, privacy concerns over continuous listening [32][33], and the need for a "learning runway" that extends beyond initial setup [17][34].

The literature strongly emphasizes the role of social scaffolding, which is often provided by adult children or grandchildren, in

motivating technology adoption and sustained use [35]. These "warm experts" provide essential technical and psychological support, helping older adults overcome initial apprehension and find practical, personalized uses for VHAs [36]. This intergenerational mediation suggests that the VHAs' ability to reduce isolation may stem less from its direct companionship capabilities and more from its role as a boundary object that facilitates meaningful interaction and knowledge transfer between older adults and their family support network [37].

3 Methodology

This research employed a mixed-method approach to examine the impact of VHAs on social connection and loneliness experienced by older adults living alone.

3.1 Participants

We recruited 13 older adults living alone, proficient in English, at least 60 years of age, achieving a score of >21 on the TCIS-M questionnaire [38] to show no significant cognitive impairment, having never used a VHA device prior to the study, having access to Wi-Fi and a smartphone at home, and not having participated in a computer skills training course within the past two years. Not by design, all of our participants are Caucasian with 1 male and 12 female. The mean age was 76 years old. The participants were recruited at senior centers in mid-western U.S. cities. Participant screening was conducted in-person, and informed consent was obtained from eligible participants.

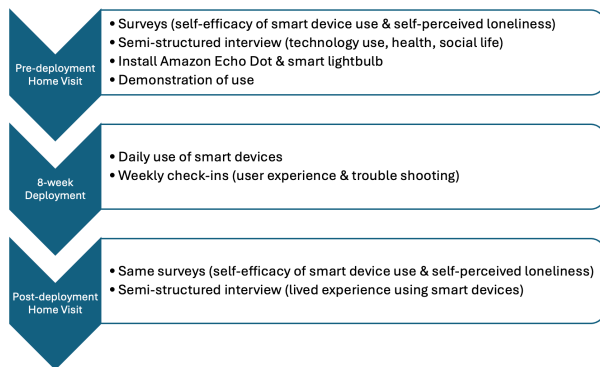


Figure 1: Pre-Post study design.

3.2 Methods

3.2.1 Data Collection. Our research adopted a pre-post study design (Figure 1). Two home visits were conducted and at least two researchers attended each home visit.

Pre-deployment home visit. A questionnaire was first administered to collect measurements of participants' self-efficacy in using AI home devices and their self-perceived loneliness using the 3-item from the Health and Retirement Study [39]. Participants were asked: "How often do you feel that you lack companionship?", "How often do you feel left out?", and "How often do you feel isolated from others?" Response options were: often, some of the time, and hardly ever, with scores 1, 2 and 3 respectively. Item responses were summed to create a total score,

with higher scores indicating lower loneliness. Next, a semi-structured interview was conducted to inquire about the participant's technology use, general health status, and social life and activities. Then the research team installed an Amazon Echo Dot and a smart lightbulb at locations desired by the participant, explained and demonstrated device usage. Participants were coached through using basic commands. A list of sample commands and a Q&A sheet for troubleshooting common issues were also provided to participants. The goal was to help participants familiarized with the voice activated interaction.

Eight-week deployment. Participants then used the smart devices for 8 weeks. Weekly check-in with participants were conducted to provide support and to help address issues they encountered.

Post-deployment home visit. In this home visit, we first conducted the same self-efficacy and loneliness questionnaire for comparison with the pre-deployment measurements. We then conducted a semi-structured interview that focused on their experience with the use of VHA, particularly its impact on their loneliness. The participants were given the smart devices for continual use.

3.2.2 Data Analysis. This paper reports the findings of the post-deployment interviews and brief pre-post loneliness responses. The interview transcripts were analyzed thematically by Affinity diagramming to identify emerging themes. Two Researchers independently read the open-ended responses, extracted key ideas onto sticky notes, and collaboratively clustered these notes based on thematic similarities and their perceived relationships, and labeled each cluster to represent a key theme.

4 Findings

In this paper, we focus on the findings of the post-deployment interviews, while brief results of the pre-post loneliness responses are included to contextualize the qualitative findings. The interviews revealed several emerging themes that played a crucial role in the older adults' usage of the VHA and their subsequent experience with the voice-driven technology.

4.1 Building confidence in using VHA takes time

Participants initially approached the VHA with hesitation due to their generally low computer literacy, a lack of prior experience, skepticism about its usefulness, and perceived challenges in learning to use the novel technology. This hesitation was further amplified when they initially interacted with the VHA as the voice interaction was new to these digital immigrants. For example, they were unsure what the device could do and what commands they could formulate at the start. Over time, however, with continued use, trial and error, and occasional assistance from family members, most participants gradually became more comfortable and confident. Eleven participants even said they felt "*totally comfortable*" or began to rely on the device as part of their daily routine after 8 weeks.

4.1.1 Lack of prior experience

Participants expressed considerable hesitation with using the VHA given their little or no prior knowledge with the novel technology that created doubt about how useful the device was for 6 participants. *"I didn't know anything about it, I didn't know anything about it, so I didn't have any feelings"* (P3), and *"unknown about this device. You know something new, so you know a little wary of it"* (P9). Moreover, 5 participants were not sure if they were able to use the device. *"Was I gonna be able to work it? Would I understand? What would I ask it? That kind of thing"* (P6). In particular, participants were adamant that they would not be able to set up the technology by themselves, as noted by P10, *"it's [confidence] probably increased because you [researcher] set it up in the first place. If I had to set it [Echo Dot] up. I probably would have been very frustrated."*

4.1.2 Voice interaction is challenging

Our participants found it difficult to phrase voice commands or ask questions understandable by the device when they first started using the VHA. P3 recalled, *"yes, a number of times. It said she [VHA] couldn't help me or she didn't understand what I wanted so I tried rephrasing it, then I gave up."* This difficulty was echoed by other participants, *"the whole point is the exactness of language. The frustration went, because that's really what it's about"* (P6) and *"I had to figure out how to ask the right questions"* (P12).

Although most participants found it easy to perform the basic functions, such as setting alarms and making lists, via voice commands, they noted struggles when changing old practices to using new technology. When asked what features were easy to use, P7 said, *"the list making. Those are all easy after you've done it once or twice. It's simple, but it's still a change of habit to go from taking a piece of paper and writing down your grocery list."*

4.1.3 Confidence increase over time and extend to other technology

Participants expressed increased confidence in using the VHA after using it for 8 weeks. P12 said, *"I'm totally comfortable using it. Yeah, no concerns no issues"* and the participant later added that they felt *"much more comfortable"* and confident in their ability to adopt other similar technology. This comfort even grew into reliance for 11 participants. P4 described, *"I am not going to go without it [VHA] now... I was thinking about getting a [smart] plug upstairs so I can have her [VHA] turn the TV off and on up there too."* Despite increased confidence and intention to continual use of the VHA, P3 acknowledged, *"I just got, maybe you should have it longer, because in the last few weeks is when I have really gotten into using it... So I think if people in my age bracket, they need maybe more time."* P6 also reflected, *"The more I can learn the better off I'm going to be."* This indicates that older adults need more than a few weeks to adjust and building up confidence takes time and patience rather than instant mastery.

4.1.4 Convenience and safety motivate smart home integration

With increased confidence and comfort with the use of Echo Dot, several participants either used the device's smart home capabilities or expressed a strong desire to increase smart home technology integration, citing convenience and safety as key motivators. P6 noted the benefit of hands-free voice-activated interaction as safety

buffer in a dark area of the house, *"say, Turn the light on, or whatever that's going to be a useful tool"* to avoid hitting a chair and falling. Similarly, P4 bought an additional smart bulb and P2 was *"purchasing another device... use the features all around the house"*, showing a proactive move toward deeper integration.

In summary, our findings revealed that the transition from hesitation to confidence in using the VHA did not happen instantly but rather gradually, reinforcing the need for ongoing learning.

4.2 Simple, practical, routine-based features valued the most

Participants consistently gravitated toward simple, everyday features that easily fit into their daily lives. Functions like alarms, reminders, weather updates, music, timers, and grocery lists were the most commonly used. These tools often helped with their daily tasks such as remembering to take medicine, listening to cooking instructions, or getting ready in the morning. These simple, reliable functions quickly became a natural part of the participants' everyday activities. Participants appreciated the ease of accessing information hands-free and timely reminders of daily tasks more than advanced or complex features. Thus, what made the device truly useful was its ability to provide quick, practical, routine-based functionality that made daily living feel easier and more organized.

Eleven participants were able to embrace the VHA into their daily routines and found ordinary tasks easier or more enjoyable. As P6 described, *"mostly first thing in the morning, getting started with the day, the temperature, and everything like that, and maybe thinking through. Is there anything, you know? Do I need to be reminded of anything?"* These participants consistently emphasized how the VHA's simple, everyday features such as alarms, reminders, timers, weather updates, and music became the most valuable and natural parts of their daily routines. These functions were essential to everyday life, *"we asked, we set up the alarms, we did the music, we did repeating alarms, we set a timer for pizza (chicken)... We played jeopardy, we sang nursery songs and danced. Um, I did have the reminders, I checked the weather everyday"* (P3). P11 echoed similar sentiment, noting how routine reminders and lists made life easier, *"The weather, the radio station, the alarm for my meds, the grocery list. ... Most helpful, probably the grocery list, the writing. Yeah, go to the store and hit button and have it all there."* These accounts demonstrate how simple, utility features played a vital role in supporting everyday life. Daily news and weather checks are also common routines (P1, P2, P11).

These reflections revealed a clear pattern. Participants appreciated the VHA not for its cutting-edge or innovative features, but for its consistent and seamless ability to offer quick, routine-based assistance that made everyday life feel simpler and more structured.

4.3 Gaps in voice commands and sustained conversations

While the VHA offers practical utility, participants noted significant limitations in the ease of the verbal interaction, particularly the need for specific phrasing of commands and the inability to sustain a natural, human-like conversation.

While 9 participants generally found the VHA easy to use, they often became frustrated by how specific their commands had to be. The VHA usually required exact phrasing to command and to respond correctly and timely. Even slight differences, like accents, slurred words, or using different terms, could result in misunderstandings, which made interactions more difficult and stressful. This limitation hindered participants who were otherwise motivated to explore the device's features. Although 7 participants learned to adjust by rewording their questions, the need for such precision remained a constant challenge.

This shows that true ease of use is not just about having accessible features, it also depends on how naturally users can communicate with the technology.

4.3.1 Misunderstanding of voice command a persistent barrier

Eight participants expressed frustration with how the VHA required extremely precise phrasing to function properly. Small variations in pronunciation or slightly different wording often led to failed attempts. P3 experienced several occasions where the VHA did not understand her request, and P12 reflected on his trial-and-error attempts, *"I had to figure out how to ask the right questions... when I was playing music, it took a few times to get exactly what you want."* Seven participants encountered issues with even small slips in pronunciation or asking a command slightly different. *"I learned not to say, 'cancel the alarm' because it cancels... you gotta say, 'turn off the alarm'. Gotta have specific words, or does exactly what you say"* (P11). The participant was frustrated that the recurring alarm that had been set was removed so it had to be set again. She also recalled asking for help spelling 'puree', but the VHA misheard it entirely, *"They gave me 'parade'. Yeah. They thought I was saying 'parade'."*

Moreover, P3 mentioned missing out on useful functions simply due to a lack of awareness. *"I didn't really realize you could ask how much time is left... I wish I would have set the timer on the stove instead because I didn't know how much time there was to go."* P13 pointed out similar limitations, noting, *"I've only been able to adjust in the app... I've tried to do it with my voice. And it basically just kind of directs me to the app."* Even when reminders were used, they sometimes lacked important details. P5 said, *"It doesn't tell you... what the reminders were for. So if I said, send me a reminder for an appointment with Jane Smith at 3 o'clock it would just send the reminder without the what it was for."*

As a result of these ongoing communication challenges, several participants admitted to abandoning their attempts altogether. P5 acknowledged, *"the command I'm saying is like the sequence, or something is wrong,"* illustrating how the need for exact order and phrasing could easily derail a request, especially since they were not sure how to fix it. Echoing this frustration, P3 said the VHA would often respond with *"I don't know what you want,"* leading to a sense of defeat. For P11, the struggle sometimes ended abruptly, *"When I talk to you [VHA], what did I call you about? Because I couldn't get it to do it?... So I just said, forget it,"* also describing a sense of defeat after repeated failures.

4.3.2 Inability to engage in natural, deeper conversation

Participants also recognized that the VHA's language processing simply operated differently from human conversation. P6 explained, *"I would have to be very clear on what I want, and I would have to have an expectation that she would not be able to answer me directly."* She also noted that people naturally speak and explain things differently, and that the VHA's limited language background made it harder to use. Similarly, P7 was disappointed at the VHA's failure in personalizing responses to explicit requests. *"I've tried, 'What's the news of the day, and you can skip financial news,' and she doesn't skip it."* As the participant reflected, *"the routineness of her responses... is somehow kind of demotivating."* Such lack of adaptability undoubtedly led to diminished user experience.

Moreover, participants expressed a strong desire for the VHA to be more conversational and maintain context across exchanges. P9 noted the frustration when the VHA *"can't do that"* and wished it could *"keep the context of like thing I just previously said... go back and forth a little bit dig deeper"* (P9). This lack of conversational depth makes the VHA feel less like an entity but more like a simple tool. As P9 observed, *"I want to continue the conversation but she's [VHA's] gone"* after receiving a personal greeting. P4, however, found the explicit request for the VHA to engage in conversation amusing, *"It cracks me up because I'll ask Alexa and I will say okay, and she will say 'oh alright and be conversational'."*

4.4 Quiet presence offers subtle emotional support but not companionship

While participants rarely described the VHA as a 'friend', 12 participants appreciated the quiet presence it brought to their daily lives. This support often came in subtle ways, such as morning greetings, light jokes, or interesting 'fact of the day' features, which helped structure their daily routines and occasionally brightened their moods. However, the VHA failed to afford deeper emotional engagement, mitigating its impacts on loneliness but participants saw its potential in offering emotional support in dire situations.

4.4.1 Small touches help lifting spirit

Instead of acting as a source of deep companionship, the VHA was most often appreciated for the comfort of having a voice nearby, music playing in the background, or casual responses that broke the silence. Eleven participants highlighted that these small touches mattered more than attempts at deeper emotional connection, suggesting that the VHA's true strength lies in gentle social engagement rather than trying to mimic real relationships. P13 found signs of life from simple exchanges, *"I would come in and say hello to it, ...or hear it say good morning. I think you know, just signs of life."* This idea of 'signs of life' framed the device as a comforting background presence rather than a partner. P13 further shared an uplifting experience, *"one day I said... 'tell me something good' and she gave me something about some property in Rhode Island... that had been donated and was being turned into a conservancy... I go. Okay, that was good, you know. And it kind of turned my, turned my moment around. That was cool."* Four other participants also described how similar touches, such as jokes, facts, or offhand comments, helped brighten their day.

4.4.2 Mixed perceptions of VHA's impacts on loneliness

The responses to the loneliness scales captured at pre-deployment and post-deployment of the VHA revealed total scores ranged from 4 to 9 and from 7 to 9, respectively. Mean scores were 6.62 (pre-deployment) and 7.92 (post-deployment), indicating a reduction in the participants' perceived loneliness after using the VHA for 8 weeks. From the post-deployment interviews, participants shared a wide range of views about whether the VHA helped reduce feelings of loneliness, often focusing more on its practical functions than its potential to provide emotional companionship. All the participants described the smart device primarily as a helpful tool. Twelve participants reported no change in their sense of social connection. Importantly, participants were clear about what the VHA was not. P7 summed up this sentiment, *"I was actually looking for there to be more of a person feeling involved? But it doesn't. It doesn't impress me that way. It's it's definitely AI... I don't feel negative about it. I just don't feel as attracted to it as I thought I might be."* Similarly, P5 expressed that while the VHA could sometimes spark spontaneous social moments, it was not a true companion. This participant *"kind of look for the possibility of Alexa being able to interact which it can, but on like to see the level of its ability to interact on like an emotional relationship, a level... it does a pretty bad job."* P11 added, *"I just don't know how that gadget helps anything with loneliness"* and *"I don't think it would help somebody with loneliness."* These perspectives suggest that for some users, the VHA's value lies more in their everyday usefulness than in any emotional support they might offer.

Even among those who did not personally feel less lonely after using the VHA, 12 participants acknowledged that it might still help mitigate loneliness or be more useful to people in different situations. Ten participants saw potential for the VHA to provide comfort, especially in situations involving isolation, limited mobility, or emergencies. P8 reflected that while they did not feel less lonely, one could benefit from the VHA in an emergency, since it would allow her to call for help remotely after a fall. P9 shared that the smart device might *"be a companion"* when alone in the bedroom, showing how it could provide a sense of presence or help connect users to others without the need to physically dial a phone. P13 also considered the VHA's positive value in circumstances such as for people with disabilities or families with children.

This range of responses highlights that while the VHA may not directly lessen loneliness, it could still support independence and provide brief moments of connection in dire circumstances, like *"hearing a voice that sounds like a real person could help"* (P10).

4.4.3 Personalization helps emotional and functional engagement

Despite the VHA's general failure in engaging the participants, 8 reacted positively when it offered personalized interactions, such as remembering their routines, using their name, or suggesting helpful actions based on their past behavior. P3 appreciated the way reminders adapted to her needs, saying, *"I like the reminders... a couple times I have asked her stuff and she'll say do you want me to always remind you or tell you."* Similarly, P4 shared that her dependence on these features grew over time, *"I'm almost got to more depending on it."* Practical benefits were also noted, such as using alarms for time management. In addition to convenience,

these personalized elements appeared to foster a deeper sense of connection with the VHA. P13 described it as feeling more "alive" when it recognized their presence. P5 also appreciated the personalization in daily routines. These small, personal touches made the VHA feel more engaging and supportive, strengthening both its practical use and emotional appeal.

However, many of these personalization features were hard to find, hidden behind complicated settings, or required extra setup, which discouraged consistent use. As a result, while these participants valued personalization when it occurred, it was not used as often as it could have been. Thus, while personalization has the power to greatly improve user engagement, it needs to be more visible, accessible, and seamlessly integrated into everyday use.

4.5 Intergenerational sharing and social curiosity enhanced adoption

Family influence played a major role in how participants were first introduced to the VHA and how they continued using it. Five participants described being introduced by children or grandchildren, whose encouragement often made the technology feel less intimidating. These intergenerational exchanges not only sparked initial interest but also framed the VHA as a tool for connection across different age groups. P2 beamingly shared his experience as a source of pride: *"I told my kids about it and they think it's great too that I'm able to do it, you know, use it!"*

As time went on, the VHA became more than just a piece of technology; it became a way for families to bond, especially through shared experiences like listening to music. P3 mentioned how her daughter encouraged her to play music with the VHA, which led to fun, shared moments. *"She says she uses it as the radio a lot, to play the music that she likes... she said, well mom just tell her to play it, so we did and we did the wheels on the bus and the hokey pokey."* These experiences strengthened bonds across generations, *"being able to create almost a spontaneous moment in relationships like the dance party... in that moment, or those moments, it increased connections with my son, my grandson"* (P5). These shared moments helped transform the VHA from a tool into a source of joyful interaction and family togetherness.

Moreover, the VHA helped bridge generational divides and keep up with modern technology. Curiosity about how younger family members used VHAs also motivated participants to continue learning. This influence across generations turned out to be a key factor in both getting started and staying engaged with the technology. Six participants talked about how they learned new ways to use the VHA by observing their more tech-savvy family members using it and how it became a more practical alternative to searching things online. *"When my kids come over, they say how they used it and I think oh, I didn't think of that. Definitely going to use it more than googling something. I didn't even think about asking her"* (P3). P2 was also surprised to learn through her daughter that his VHA was facilitating calls, *"I found out the other day that whenever I call her I'm on Alexa. And they have it set up that way and I didn't realize that."*

Overall, these intergenerational interactions helped 5 participants become more comfortable with new technology. P3 reflected on the difference between her upbringing and today's

digital world, “*I’m from the era without using computers or cell phones ... you don’t have to google it, you can just ask her.*” P5 also saw the VHA as a way to stay connected to current trends and ideas across generations and potentially useful in reducing feelings of isolation by helping older adults stay part of modern conversations.

5 Discussion

This study reveals a nuanced picture of how older adults come to adopt, adapt to, and emotionally negotiate their relationship with a virtual home assistant (VHA), the Echo Dot. Findings from 13 post-use interviews offer insights that can advance ongoing conversations in HCI about technology adoption in later life, voice-based interaction, and the role of intelligent systems in supporting social and emotional well-being.

5.1 Extended Learning Trajectories as a Core Component of Older-Adult Technology Adoption

A first major insight is that learning to use a VHA is not a single moment of onboarding for older adults. Rather, it is a longitudinal process marked by gradual confidence-building, ongoing experimentation, and periodic frustration. This finding extends existing work on technology adoption among older adults, which emphasizes the influence of self-efficacy and prior digital literacy, e.g., [40][41]. Our findings add nuance by demonstrating how voice-controlled systems, which appear simple on the surface, are not inherently easy for older adults. Moreover, the extended onboarding runway used in this study illustrates that eight weeks, albeit already relatively long for a field study, was still not long enough for some participants to reach fluency. Participants explicitly reported needing more time to explore features before reaching stable adoption.

This suggests that VHA design should shift from short-term onboarding models to longitudinal support frameworks that anticipate slow but meaningful mastery. This contributes to HCI discussions on technology appropriation [42], demonstrating that older adults’ evolving relationship with voice-based agents is not linear but cumulative, experiential, and reinforced through successful everyday use. Thus, if VHAs are to support independent living, medication adherence, or emergency response, prolonged and patient-centered learning periods must be built into both design and deployment models.

5.2 Routine-Based Utility as the Primary Driver of Long-Term Engagement

Despite the wide range of functionality available in VHAs, participants consistently valued simple, low-friction, routine-based features. These lightweight interactions were easily integrated into daily rhythms and often helped participants manage household tasks, self-care habits, and cognitive load. These findings align with prior research showing that older adults benefit most from technologies that normalize daily activities, reduce cognitive load, and enhance feelings of competence, e.g., [43]. This contributes to ongoing discourse around how everyday technologies scaffold “mundane but meaningful” forms of care and self-management in the home, e.g., [44]. The findings also reinforce that small,

predictable technological supports can help maintain independence, which is a key goal in aging-in-place and gerontechnology research [45].

Rather than serving as advanced personal assistants, VHAs often functioned as ambient cognitive scaffolds that quietly support memory, organization, and household functioning. This extends existing literature by showing that the value of VHAs for older adults lies not primarily in artificial intelligence sophistication but in the technology’s ability to assimilate into micro-rituals of everyday living. This parallels prior findings that for older adults, usefulness and habitual integration strongly drive sustained engagement more than novelty or complexity [35].

5.3 Voice Interaction Remains a Significant Barrier

Although voice-controlled devices promise low-barrier interaction and most participants enjoyed convenient access to information, our findings underscore persistent limitations such as strict phrasing requirements, poor error recovery, inconsistent recognition of accents or pronunciation, and limited contextual awareness.

This supports research that shows that older adults are disproportionately affected by natural language processing limitations because voice output requires rapid lexical formulation and clear articulation—skills that can be more challenging with age-related cognitive or speech changes [46]. For older adults, the stakes are higher since misunderstood reminders, unexpected timer cancellations, or inability to modify settings by voice can erode user trust and sometimes cause abandonment of tasks altogether. The study therefore extends conversational agent research by emphasizing the importance of reparability and language forgiveness as central dimensions of usability, not only accuracy.

Our findings further reveal that conversational limitations affect long-term emotional engagement. When the VHA failed to stay in the conversation, it reinforced the perception of it as a tool rather than a partner. This aligns with prior research that speech-based interfaces, while appearing natural, often failed to support the fluid conversational patterns humans expected [26][47]. These findings suggest that successful aging-oriented VHA design must move away from expecting users to adapt to system syntaxes and instead, interpret imprecise commands, learn user-specific speech patterns over time, and provide clear recovery paths when misunderstandings occur. Moreover, VHAs intended for medication adherence, appointment reminders, or emergency communication must support flexible, human-like linguistic variation to avoid preventing or delaying critical actions.

5.4 Quiet Presence as Subtle Emotional Support but Not a Substitute for Human Connection

An important nuance surfaced in the interviews was that the VHA was not framed as a social partner but as a *sign of life* in the room. This finding contradicts recent claims that VHAs readily reduce loneliness or form convincing companion relationships [17]. Meanwhile our study drew a clear boundary between comforting presence and emotional relationship. This aligns with scholarly critiques that emotional AI should not be evaluated solely in terms of whether it replaces companionship, but whether it supports daily

emotional life. The VHA's strength appears not in simulating personhood, but in enabling new capabilities that foster independence, provide structure, and add incidental moments of delight. VHAs may mitigate loneliness indirectly by supporting routines that create daily structure, offering immediate access to information, providing a sense of presence during isolated moments, and enabling emergency support, thereby reducing anxiety about being alone. Thus, this contributes to scholarship by clarifying that VHAs serve as well-being scaffolds rather than emotional companions. Their value lies in supporting autonomy, not substituting social relationships.

5.5 Intergenerational Influence as a Catalyst for Adoption and Social Connection

Beyond functional learning, intergenerational interactions, such as playing music together, were moments of joy, bonding, and pride. This supports prior work showing that family networks significantly shape older adults' technological adoption, e.g., [48]. Our findings extend this by illustrating how VHAs can become sites of intergenerational play, creating shared experiences that transcend age differences. This is important because it suggests that designing for intergenerational delight can strengthen technology adoption and VHAs can serve as conversation bridges to help older adults stay connected to cultural practices and digital trends of younger generations. Importantly, intergenerational learning can reframe technology from intimidating to empowering older adults. Thus, fostering intergenerational support networks is linked to sustained digital engagement, which can indirectly enhance health management and reduce social isolation.

5.6 Limitations

This study has several limitations that should be considered when interpreting the findings. First, the sample size was relatively small ($N=13$), which is appropriate for in-depth qualitative inquiry but limits generalizability. Second, all participants were Caucasian, predominantly female, living alone, and recruited from senior centers in Midwestern U.S. cities. Their experiences may not reflect those of more diverse populations, including older adults from different cultural backgrounds, socioeconomic contexts, geographic regions, or living arrangements. Third, the deployment period, while longer than many prior VHA studies, was limited to eight weeks. Several participants explicitly noted that they were still learning and discovering features toward the end of the study, suggesting that longer-term deployments may surface additional patterns of use, reliance, or disengagement. Fourth, although pre- and post-questionnaires on loneliness and self-efficacy were collected, this paper focuses on qualitative interview data; thus, we do not claim measurable changes in loneliness outcomes based on this analysis alone. Finally, the study examined a single commercial device (Amazon Echo Dot) with a specific interaction paradigm. While the Amazon Echo Dot served as a robust and accessible platform for this study, it is important to acknowledge that it does not represent the current state-of-the-art in conversational agent architecture, particularly when compared to nascent large language model (LLM) integrations and sophisticated multimodal systems. The device's interaction paradigm is

primarily command-driven and constrained by specific wake-word architectures, which may lack the nuanced turn-taking, contextual memory, and prosodic flexibility found in more advanced research prototypes. Consequently, the communicative patterns and user behaviors observed in this research are inextricably linked to Echo Dot's specific technical affordances and may not fully generalize to the broader, rapidly evolving modality of conversational AI. Researchers should therefore exercise caution when extrapolating these findings to next-generation agents that offer more fluid, human-like, or high-agency interaction styles.

6 Conclusion

This study examined how older adults living alone adopt, appropriate, and make sense of a commercially available VHA, the Amazon Echo Dot, over an eight-week period. Through in-depth post-deployment interviews, we investigated not only functional use but also participants' expectations and experiences regarding social presence and loneliness. Our findings reveal a fundamental tension between transactional utility and social companionship in current VHA design, which is especially salient for older adults. Moreover, participants successfully domesticated the VHA as a practical, reliable tool that supported Instrumental Activities of Daily Living, safety, and routine management. Features such as reminders, alarms, weather updates, music, and smart home controls became deeply embedded in their daily life, contributing to feelings of competence, independence, and reassurance. Over time, many participants transitioned from initial hesitation to confidence, and even reliance for several participants, highlighting the importance of extended learning trajectories and longitudinal exposure in older-adult technology adoption.

However, this instrumental success did not translate into meaningful social companionship. Participants were explicit in distinguishing between the VHA's usefulness and its inability to provide reciprocal, emotionally grounded interaction. While they appreciated the VHA's quiet presence, such as its greetings, jokes, music, and "signs of life", they largely rejected it as a substitute for human connection. The breakdown of conversational flow, lack of context retention, and rigid command-response architecture repeatedly fractured any emerging illusion of social presence. As one participant succinctly captured, *"I want to continue the conversation, but she's gone."* The study also highlights the critical role of intergenerational scaffolding. Adult children and grandchildren acted as warm experts, lowering barriers to entry, modeling use, and transforming the VHA into an avenue of shared play and learning. In this way, the VHA's social value often emerged not through direct companionship with the AI, but through the human relationships it helped mediate.

Taken together, this work contributes to HCI by offering a nuanced account of AI companionship in later life. Rather than framing VHAs as failed companions or simple tools, we argue for understanding them as technologies whose primary value lies in supporting autonomy, routine, and indirect social connection. Bridging the gap between transactional utility and emotional support will require moving beyond command-and-control

paradigms toward designs that foreground phatic communication, contextual continuity, and proactive yet respectful engagement.

In conclusion, this study underscores that older adults do not simply accept or reject AI companionship; they actively negotiate its role in their lives. Designing future VHAs for aging-in-place will require respecting these boundaries while thoughtfully expanding the forms of interaction that support dignity, autonomy, and everyday emotional well-being.

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