Perceptions of Technology Among Older Adults

ABSTRACT
Changes and advancements in technology have the potential to benefit older adults by promoting independence and increasing the ability to age in place. However, older adults are less likely to adopt new technology unless they see benefits to themselves. This study assessed the perceptions of 30 older adults in the Midwest concerning technology via three separate focus groups (i.e., independent apartment complex, a rural community, exercise program participants), which addressed a need in the literature (i.e., inclusion of oldest-old and rural individuals). The focus group questions included items such as what technology older adults currently used, desired improvements in technology, and the greatest challenges participants were facing or would face in the future. Overall, older adults were enthusiastic about learning new forms of technology that could help them maintain their independence and quality of life. Five themes emerged from all three focus groups: (a) Frustrations, Limitations, and Usability Concerns; (b) Transportation; (c) Help and Assistance; (d) Self-Monitoring; and (e) Gaming. The themes have important implications for future technology developed for older adults; in particular, older adults were willing and eager to adopt new technology when usefulness and usability outweighed feelings of inadequacy.

BACKGROUND
Smart home and telehealth technologies have received increasing attention as possible solutions to meet the needs of older adults (Demiris et al., 2004; Gellis et al., 2012; Mann, Marchant, Tomita, Fraas, & Stanton, 2002; Richardson, Frueh, Grubaugh, Egede, & Elhai, 2009; Wade, Shaw, & Cartwright, 2012). Older adults may experience benefits such as increased quality of life and health care cost savings (Magnusson & Hanson, 2005). In addition, telehealth-care is thought to be especially beneficial for older adults who do not have access to transportation or are
physically unable to leave their home (Gellis et al., 2012). Advancements in telehealth technology now range from telephone capabilities to more advanced technologies that incorporate virtual reality simulators (Richardson et al., 2009).

Overall, previous research has found that older adults seem to welcome technological advancements and the development of smart home technologies (Coughlin, D’Ambrosio, Reimer, & Pratt, 2007). However, existing research has neglected to look at older adults’ technology preferences through a life course theory lens, taking into account the time period in which older adults grew up and how that era may play a role in their technology opinions, preferences, and rates of adoption.

The theory of diffusion of innovations (Rogers, 2003) provides one of the theoretical foundations for this study. In essence, based on this theoretical perspective, older adults will be less likely to adopt new technologies into their lives unless they see clear benefits to themselves. Life course theory also provides insight into older adults’ technology perceptions and usage through a time and historical period framework by taking into account how previous event histories may influence later outcomes in individuals (White & Klein, 2008). Older adults did not grow up with the kinds of technology that are so prevalent in society today. Older adults today would likely have had to seek out opportunities to learn new kinds of technology because various forms of technology were not invented let alone taught through school or in the workplace (e.g., computer applications, cell phones, Skype™).

Older Adults and Perceptions of Technology

Past research investigating older adults’ views on technology seem to indicate their willingness to accept and incorporate technology into their lives (Demiris et al., 2004). However, older adults are sometimes unaware of the ways in which technology can benefit them or what devices are available for them to use (Zajicek, 2006). Although at first older adults may be apprehensive of new forms of assistive technology, the benefits outweigh the costs, as technology may aid in primary (e.g., health preservation), secondary (e.g., early detection and swift treatment), and tertiary prevention (e.g., slowing down the rate of disease), as indicated in research by Dishman, Matthews, and Dunbar-Jacob (2004).

Older adults who are comfortable using computers for e-mail and other online browsing purposes still have suspicions about new technology, including concerns about personal privacy violations, user friendliness, appropriate training for older adults, and declining human technology support (Demiris et al., 2004). Learning more about older adults’ opinions of technological developments can be achieved through focus group research, where researchers can relatively easily gain information from older adults. In this study, three older adult focus groups participated in discussions on technology and aging.

Gerontechnology Focus Groups

Previous gerontechnology focus groups have already been conducted, in which participants were asked about their feelings toward new technologies (Coughlin et al., 2007; Melenhorst, Rogers, & Caylor, 2001; Mynatt, Melenhorst, Fisk, & Rogers, 2004). However, the current study is unique in that participants included oldest-old adults (i.e., 85 and older) and a rural sample. In addition, participants were asked to think about some of the greatest needs and challenges in their lives before talking directly about ways in which they used technology or specific technology applications. We believed it was important for participants to think about their current and future needs before moving the discussion in the direction of technology applications, in order for participants to start thinking about how technology could assist them with their identified needs. We used what is known as a funneling technique in focus group research, where questions transition from open ended to more specific (Krueger, 1998). To our knowledge, previous studies have not asked participants to consider their current and future needs before transitioning to a discussion on specific technologies.

Prior research has noted the importance of asking participants or future users of technology about their own health problems and limitations (Mann et al., 2002). Existing research has also pointed to the importance of a user-driven perspective to technology designers (Demiris et al., 2004). Demiris et al.’s study took into account the user-driven perspective by asking questions such as “What might make it easier to use technological devices?” and “Which improvement would you like to see come to market and be widely distributed first?” Furthermore, by beginning each focus group with questions about challenges and needs and then moving toward questions about what technologies help address such problems, participants may begin to understand how specific technologies can be beneficial to them. Melenhorst et al. (2001) pointed to the importance of showing participants how technology can clearly benefit them.

The purpose of this research study was to explore some of the greatest needs and challenges a diverse group of older adults believed they were facing or would face in the future. We were interested in learning more about advantages and disadvantages older adult users associated with technology, as well as how future innovations in technology may be able to address unmet needs. Learning more about how technology can address unmet needs from the older adult user perspective is a

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relatively new phenomenon. Typically, focus group participants are asked about their preferences for technology in everyday life; however, the current study asked participants to think about how technology could meet their needs in the future. Likewise, participants were asked to brainstorm about what changes in technology they would like to see in the future. We thought asking older adults to consider their own future needs and how technology may be able to meet aging needs would stimulate unique responses and fill an existing gap in the current literature on technology use among older adults.

METHOD

Three separate older adult groups were asked to participate in focus groups concerning their views on technology. All members belonging to one of the following three older adult groups were invited to participate at their own discretion. One focus group was recruited from an apartment complex for older residents in a university town with a population of approximately 50,000; the second was conducted in a rural community (with a total of approximately 70 residents); and the third was a group of older adults participating in an exercise program in a university town. All three focus groups took place in the midwestern United States. None of the participants lived in an assisted living or nursing home environment, as we first wanted to hear about the ways in which relatively healthy and active older adults used technology.

Diverse participants were sought, as it was thought that varying populations of older adults may have very different perceptions of technology and use technology in diverse ways. In particular, the first focus group setting was selected to represent a more urban group of older adults. A rural focus group was chosen to note differences between the ways in which rural and in-town older adults perceived technology. We also hypothesized that rural older adults would face unique challenges in maintaining their independence (e.g., isolation, transportation, access to medical care) that would ultimately influence their perceptions about technology. An older adult exercise group was also contacted because we thought older adults currently participating in exercise programs may focus on exercise or telehealth technologies in ways other focus group

<table>
<thead>
<tr>
<th>Variable</th>
<th>n (%)</th>
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<tbody>
<tr>
<td>Age (mean = 83, SD = 8.11 years)</td>
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</tr>
<tr>
<td>60s</td>
<td>3 (10)</td>
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<tr>
<td>70s</td>
<td>5 (16.7)</td>
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<tr>
<td>80s</td>
<td>18 (60)</td>
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<tr>
<td>90s</td>
<td>3 (10)</td>
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<td>100s</td>
<td>1 (3.3)</td>
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<tr>
<td>Sex</td>
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</tr>
<tr>
<td>Women</td>
<td>18 (60)</td>
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<tr>
<td>Men</td>
<td>12 (40)</td>
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<td>Race/ethnicity</td>
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<td>Marital status</td>
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<td>Widowed</td>
<td>14 (46.7)</td>
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<tr>
<td>Divorced</td>
<td>1 (3.3)</td>
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<tr>
<td>Single</td>
<td>1 (3.3)</td>
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<tr>
<td>Employment status</td>
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<tr>
<td>Retired</td>
<td>29 (96.7)</td>
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<tr>
<td>Working part time</td>
<td>1 (3.3)</td>
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<td>Educational attainment</td>
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<tr>
<td>Some college</td>
<td>7 (23.3)</td>
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<tr>
<td>College degree</td>
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<td>Some postgraduate education</td>
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<td>Graduate or professional degree</td>
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<td>Missing data</td>
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<td>Self-rated health</td>
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<tr>
<td>Excellent</td>
<td>7 (23.3)</td>
</tr>
<tr>
<td>Between excellent and good</td>
<td>3 (10)</td>
</tr>
<tr>
<td>Good</td>
<td>12 (40)</td>
</tr>
<tr>
<td>Fair</td>
<td>8 (26.7)</td>
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</tbody>
</table>

Note: Percentages may not total 100 due to rounding.
Think for a moment about your daily life. What are some of the greatest needs and challenges you have?

Where do you see yourself in the next 3 to 5 years? Are there specific problems you are anticipating?

Which technologies do you use or know about that are helpful in addressing some of the most pressing problems of older people?

What are the advantages and disadvantages of using technological devices?

In what ways would these technologies be helpful?

Which improvement would you like to see come to market and be widely distributed first?

How important is it to find technological solutions for the following problems:

a. Improving communication with others?
b. Assisting with physical exercise?
c. Assisting with memory problems?
d. Assisting with social engagement?
e. Improving your home and environment?

What might make it easier to use technological devices?

What has been the most important topic that we have discussed today?

Our purpose today was to discuss any needs you have and challenges you face now and in the future and how technology might be helpful. Have we missed anything?

### Table 2

<table>
<thead>
<tr>
<th>FOCUS GROUP QUESTIONS</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>2. Where do you see yourself in the next 3 to 5 years? Are there specific problems you are anticipating?</td>
</tr>
<tr>
<td>3. Which technologies do you use or know about that are helpful in addressing some of the most pressing problems of older people?</td>
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<tr>
<td>4. What are the advantages and disadvantages of using technological devices?</td>
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<tr>
<td>5. In what ways would these technologies be helpful?</td>
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<td>d. Assisting with social engagement?</td>
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<tr>
<td>e. Improving your home and environment?</td>
</tr>
<tr>
<td>8. What might make it easier to use technological devices?</td>
</tr>
<tr>
<td>9. What has been the most important topic that we have discussed today?</td>
</tr>
<tr>
<td>10. Our purpose today was to discuss any needs you have and challenges you face now and in the future and how technology might be helpful. Have we missed anything?</td>
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</table>

Participants were first informed about the study, completed a demographic questionnaire, and then the focus group began. Although the focus groups were led by a facilitator (P.M.), participants were free to bring up their own questions or comments to contribute to the discussion. Approval for this research study was obtained from the University Institutional Review Board.

Participants Information was collected from 30 participants. Focus Group 1 included 7 participants, Group 2 had 12 participants, and Group 3 had 11 participants. Twelve participants were men, and 18 were women (Table 1). With the exception of 1 person who did not respond, all participants self-selected White as their race/ethnicity. This study had equal numbers (n = 14) of married and widowed participants. Additionally, 1 participant identified being single, and 1 identified being divorced. Almost all participants were retired (n = 29, 96.7%), and 73.3% (n = 22) reported being in good to excellent health. Educational attainment was mixed, but all participants were at least high school educated.

### Materials and Procedure

Focus group questions were created and developed after reading existing technology focus group research and consulting with researchers in varying fields (i.e., computer science, gerontology, kinesiology). We theorized that including multidisciplinary questions increased the likelihood we would learn an expansive amount of information regarding older adults’ technology preferences. Before beginning the focus group, participants were asked to complete a brief demographic questionnaire asking about their age, sex, race/ethnicity, marital and employment status, educational attainment, and self-rated health. After the questionnaires were completed, the focus group began with a question asking participants to think about some of the greatest needs and challenges in their everyday lives (Table 2).

During the 1-hour time period, participants from each focus group were asked open-ended questions about technology and talked about their feelings and ideas related to technology. Previous gerontechnology focus groups used similar methods by asking questions about barriers to technology use and ways to reduce such barriers (Coughlin et al., 2007). Asking broad questions such as about older adults’ general use of technology has also been used in previous studies (Demiris et al., 2004), as well as in the current focus group study. All focus groups were video-recorded and later transcribed verbatim to evaluate the information.

### Data Analysis

All three focus group transcriptions were read through separately by two different researchers (M.H., P.M.) to understand the data before codes or categories were developed. Data from each focus group were then carefully coded and categorized by the two researchers individually. The two researchers used what is known as a “bottom-up” approach in qualitative research, also known as an inductive mode of analysis, in which categories and themes are emergent (Creswell, 2007) and surfaced directly from participant transcripts. Researchers used the Track Changes function in Microsoft Word® to code the data by making comments when reading the text. The highlighting function in Microsoft Word was next used to categorize the data into color-coded categories. Categories were then separated into different Word documents, and the
researchers discussed the emergent themes present in the data.

Both researchers reviewed their codes and categories together to check for reliability, and five themes eventually emerged from the data. Creswell (2007) recommends that multiple coders analyze the data separately and then discuss preliminary findings to increase reliability. Peer reviews were completed by sharing the transcripts and themes with researchers from collaborating departments, including computer science, gerontology, and kinesiology (H.-I.Y., J.W., P.M., W.F.). Conducting peer reviews increases the validity and rigor of qualitative research (Creswell, 2007). Themes ranged from health aspects, such as self-monitoring, to entertainment, such as computer gaming.

RESULTS

Five themes were noted in the three focus groups about technology and aging:

- Frustrations, Limitations, and Usability Concerns.
- Transportation.
- Help and Assistance.
- Self-Monitoring.
- Gaming.

Specific categories and themes are noted in Table 3. The five themes were derived from the most prevalent topics mentioned across all three focus groups. Not all themes reflected older adults’ technology perceptions explicitly; some themes reflected challenges associated with aging. We decided to include all themes within the context of this article as we would argue that age-related challenges reported by participants are related to the way in which older adults perceive and ultimately adopt technology. Some themes also reflected very different levels of negativity and positivity toward technology. However, it was not our intent to assess value differences in themes, only to report what emerged from the data.

Frustrations, Limitations, and Usability Concerns

This theme focused on the overall frustrations and limitations older adults perceived with technology in general. While frustrations, limitations, and usability concerns may come out in the undertones of other themes, we clearly saw the need for it to have its own identity. Some participants were concerned with society’s overreliance on technology, whereas others were more frustrated with automated technological advancements and declining human contact. In addition, their desire for more simplistic versions of technology was voiced, as participants were frustrated with overly complex devices. One participant noted, “You still need human contact!” Another participant indicated:

But I think too often it’s so easy to go...first thing in the morning turn on that computer and then every hour or so check to see if I have something on there. And it’s frustrating to me to realize that that really is the life of a lot of people. They’re so dependent and we lose a lot of the personal aspect of our lives.

Another participant noted, “The computer is too mechanical.” A participant also commented:

I am upset with people that are using it [computer] as a social contact. I mean it seems to me to be kind of counterproductive. They draw back from talking to each other, from writing letters and all of that and then they get on these social things and...well it doesn’t sound like any sense to me.

A participant also remarked, “One technology that bothers me is that when I call and I get a machine to talk to.”

Another participant noted, “I think at our age we’re pretty puzzled about computers, but anyway we’re entirely afraid of them, we’re afraid we’re going to make the thing crash.” One participant remarked, “Yes, it can be very frustrating if you can’t make it do...I can’t learn to think like the computer people, the way they designed it. My thinking is a little old fashioned.”

Many participants also noted that technology is often overly complicated and cumbersome to use and learn. Participants expressed an interest in more simplified technology. A participant mentioned:

I got a new piece of technology here that drives me crazy [holds up cell phone]. I don’t want a computer, all I want to be able to do is if I’m at the grocery store to be able to call home and say do we need anything here that I haven’t picked up? Or, I’m going to be home in an hour, don’t

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**TABLE 3**

FOCUS GROUP THEMES AND CATEGORIES

<table>
<thead>
<tr>
<th>Frustrations, Limitations, and Usability Concerns</th>
<th>Transportation</th>
<th>Help and Assistance</th>
<th>Self-Monitoring</th>
<th>Gaming</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Loss of social contact</td>
<td>• Driving ability</td>
<td>• Asking for help</td>
<td>• Maintaining abilities</td>
<td>• Competition</td>
</tr>
<tr>
<td>• Overreliance</td>
<td>• Needing a ride</td>
<td>• Hiring help</td>
<td>• Mental exercise</td>
<td>• Computer games</td>
</tr>
<tr>
<td>• Inadequacy</td>
<td>• Public transportation</td>
<td>• Home maintenance</td>
<td>• Physical exercise</td>
<td>• Cards</td>
</tr>
<tr>
<td>• Fear</td>
<td>• Complexity</td>
<td></td>
<td>• Telehealth</td>
<td></td>
</tr>
</tbody>
</table>

...
worry about me I’m fine. Just to communicate. I don’t need all this stuff.

Another participant noted, “About cell phones and computers, I wish that the senior going into the store could know this is simplified…. I don’t need all the bells and whistles.” A participant also remarked:

I agree. My daughter sent me a cell phone in September and I swear it does everything but cook my meals for me. I don’t need that, I can’t really see anything, and then I have to drag out the instruction booklet and my magnifying glass to figure out what’s happening.

Another participant mentioned:

And cell phones, all of these things, there is just so many of them that are so difficult and beyond to where you can actually see and use them and learn with them. They could be simplified and streamlined in many ways. We don’t need all that, we don’t need all the cost of it, we don’t need…. How many of us here text message?

Overall, a number of participants indicated their reservations about technology. In one case, a focus group had the impression that the focus group leader wanted to “sell high tech,” when the group of older adults was merely interested in “low-tech” changes.

Transportation

A second theme expressed by participants concerned issues such as driving abilities and asking for rides as difficulties associated with aging. In particular, participants from one focus group wondered how technology could assist them in organizing transportation needs (e.g., setting up a computerized driver and/or rider system). One participant noted:

Well, I think we’re not the best drivers anymore. I can’t drive my car to go to physical therapy and I have to ask somebody to go anywhere that’s aggravating.

Another participant noted, “These transportation problems are something that bothers us.” A participant also mentioned, “It seems to be more and more of a challenge, transportation is a big issue.” One participant remarked, “I mean my husband died and not only did I lose my companion of 24 years but I lost my chauffeur.” A participant also stated, “She has vision problems, so she has been dependent on others to take her places, except when the weather is nice she has a scooter.”

Another participant noted:

I think you’re to be commended for recognizing that it’s getting difficult to drive. A lot of people, several people I know should have stopped driving altogether I think, because it’s pretty dangerous to ride with them. I think it’s very wise. We don’t like to give up those freedoms [but] it’s very important.

Public transportation, or the lack thereof, was also mentioned. One participant stated, “Public transportation means walking two blocks to catch the bus.” Another participant remarked, “We love to go to those things [plays/musicals]…they’re important to us…but getting there.”

A participant also mentioned, “Now we’re down to no cars and no drivers.”

Help and Assistance

The third theme detected concerned help and assistance. Asking for help was difficult for some participants, while maintaining a home proved to be challenging for older adults as they aged. This theme reflected age-related challenges and was less reflective of older adult perceptions of technology. However, it clearly points to the need of developing technology to assist older adults in maintaining their own independence. Participants noted more difficulty with yard and household work. One participant noted, “When my children come I have a honey-do list.” Another participant mentioned, “I hope to have someone to cut my lawn and pick up my leaves.”

Another participant remarked, “Perhaps one of the hardest things, at least for me is to ask for help. I feel I don’t need it but…it’s important. People appreciate being asked.” One participant also stated,

I’m planning on hiring as much help as I need and that’s why this is independent housing and we can do that. There are three companies here in town that are very good at that and we are working with one of them already.

Another participant noted, “Yes and another challenge is I have three grown children and they don’t live anywhere near here so I can’t rely on my kids. I’ll have to rely on professional help.” One participant also said:

I never needed anyone to help me clean the house before, but I could have help with that. And we are moving to a place where we need help with changing the bed and help with showers and all of that.

One participant noted, “Just getting out in bad weather, cleaning your walks and things, you have to be dependent on somebody else especially after you’ve been in heart surgery.” Another participant mentioned, “Well one of my sons and his wife are insisting that I have someone come and clean my house twice a month and they’re going to pay for it.”

A participant also remarked, “Keeping up the house, the building, with minor repairs and finding somebody who will do those things [in reference to the greatest challenges the participant would face in the future].”

In general, participants noted that as they get older, more help may be needed and that hiring help was sometimes desirable. Although it was unclear how computer technology might help, participants were open minded with regard to the use of technology to help with everyday tasks.

Self-Monitoring

The fourth theme concerned the general issue of self-monitoring. The ability to use technology to maintain or even improve both physical
and mental functioning or accuracy seemed of interest to some participants. While some participants focused on competition, others were more interested in self-monitoring health scores. One participant commented, “There’s a jigsaw puzzle I put together every day, just because it’s some competition for me that isn’t there anymore.”

Another participant mentioned, “I feel like we should have some contests in the class. In other words, who has lowered their BMI [body mass index] the most or what class has reduced their BMI more than other classes.” One participant also stated, “I think my competition should be with myself [in reference to physical fitness competition].” Another participant noted, “I learn something and do it again and I’ll grade myself if I need improvement.”

One participant also mentioned nutritional self-monitoring through reading nutritional labels on packaged food items:

One of the things that’s very helpful now is the information that is on the foods that we buy. All of us are reading labels now. We never used to wonder if there was sodium or whatever, but now we read the labels.

Participants pointed out that these cognitive or physical tasks allowed them to compare their level of performance to themselves. Some participants were interested to compete in cognitive games against others, whereas other participants were interested only in comparing against their own previous scores.

Another important aspect of self-monitoring concerned the usefulness of telehealth. One participant noted, “Say if we were visiting our daughter, we could have accessed it [medical records] out there.” Another participant remarked, “Actually, there is a lot of good things about technology that are allowing people in small towns and rural areas to get the benefits of what we used to have to go to the big city for [in regard to telehealth technology].”

The use of telehealth minimizes traveling and maximizes efficiency. This was particularly true for the rural focus group. Several participants had experienced heart trouble and were under telehealth observation. There was much appreciation for telehealth technology by the participants.

Gaming

The final theme detected in the transcripts was related to using the computer as a gaming device. Participants often mentioned playing games, such as card or word games, when using computers as a source of entertainment. Some participants also mentioned the importance of using technology to stimulate the mind. One participant noted, “I play Scrabble® on my computer.” Another participant mentioned, “I do crossword puzzles every day.” A participant also remarked, “On the puzzle it’s just my mind but in card games yes, there are scores. You play against the machine and to me, I enjoy that.” One participant noted, “Well I play cards on the computer, and I normally don’t play cards but we have card groups in this building that are very popular, bridge players, a few other games.” Another participant also commented:

I really enjoy that because I enjoyed playing cards many years ago so I really like that. There’s another thing my daughter showed me on there, um, jigsaw puzzle. I put that together every day and work hard at it, trying to do it as fast as I can, just because it’s some competition for me that isn’t there anymore.

One participant mentioned, “I think following the idea of crossword puzzles, one could get a lot of [mental] exercise.”

Quite a few participants mentioned that they played a quick game of solitaire, and when another participant asked why she could not play in the activity room with others instead of the computer, she replied that she could not invite others at midnight or when she could not fall asleep. Card games in particular were very welcome features of the computer.

DISCUSSION

The purpose of this study was to find out how older adults currently used technology in their daily lives, their perceptions of technology, as well as advantages and disadvantages of technology. In addition to learning more about older adults’ perceptions of technology, we learned about their self-reported needs in the future. It is interesting that these needs were so prevalent in the transcripts and likely speaks to the fact that there is a long way to go in terms of using technology to better address the needs of older adults. The feedback given by participants may also be helpful in developing future technology or modifying existing technology to meet the needs of older adults.

This study adds to the existing literature on older adults’ technology use by including populations that have been understudied (i.e., the oldest-old and rural older adults). Some unique findings were noted in this study and were related to instrumental activities of daily living. In particular, rural older adults seemed to be quite connected to one another, thus transportation posed less of an issue than for the other groups. Interestingly, the participants from the university town reported more concern with finding a ride or transportation when they were no longer able to drive. Rural participants also vocalized the need to maintain their homes more so than the other focus groups. This is likely because rural participants live on farms or acreages that require significantly more upkeep than in-town properties. However, rural participants had more people to rely on for assistance (e.g., friends, neighbors).

Overall, the study findings indicate that older adults were eager to learn more about technology and ways in which it could potentially
help them maintain independence and a high quality of life. Participants were also very interested in using technology to maintain or even increase both their physical and mental abilities. Although older adults were receptive to new forms of technology, they still reported uneasiness about the lack of a human connection and their own abilities to successfully use technology.

The responses older adults gave about their greatest needs and challenges were not unusual in that they focused on the ability to remain independent in various areas of their lives, ranging from activities of daily living to maintaining their own home. Many older adults recognized that in the future they may need more assistance to meet their needs. Interestingly, participants’ responses concerning how they would go about meeting their needs varied. More solutions dealt with moving or hiring help, rather than adopting new technology to meet their needs. As previous studies have found, this may again be the result of older adults not understanding how technology can be of benefit to them (Aminzadeh & Edwards, 1998). In the same regard, participants were often unaware of the wide variety of existing technologies on the market, which may be why participants in this study did not have a lot of discussion and interaction when asked about technology that helped address their aging needs. Nonetheless, similar to research by Coughlin et al. (2007), participants were eager to learn more about new technology and seemed accepting of new advancements. Because many participants from all focus groups reported a general unawareness of existing technologies, a technology fair or product display session may be interesting and informative for older adults. At such an event, older adults may be able to test out products and gain a sense of perspective on what types of technologies may be beneficial to them or meet their needs.

Discussion about negative aspects of technology during the focus groups was not surprising, including apprehension about more automated telephone answering systems. Such apprehension is related to previous research indicating older adults’ uneasiness about declining human contact in seeking technological support (Demiris et al., 2004). Reported feelings of inadequacy related to technology in this study are similar to other research findings indicating user friendliness of new technology as a fear of older adults (Demiris et al., 2004).

Focus group participants also responded differently and in ways we did not expect. In particular, it was somewhat surprising that transportation issues seemed to play a much larger role for participants living in the older adult complex. Participants felt uneasy asking one another for rides, perhaps due to the fact that they may not have known one another very well. Interestingly, participants in the rural focus group did not report transportation issues as being a major cause for concern. Rural focus group participants were able to rely on their friends and neighbors when they needed help and did not express concern about getting to places. This was somewhat surprising but does speak to small-town life, as individuals have likely grown up together and known one another for many years. Participants in the rural setting were less hesitant to ask for help from one another and appeared to try and help one another out as best they could. Finally, it is not surprising that participants from the exercise group were more likely to focus on health technologies (e.g., health monitoring, telehealth technology). These individuals have already taken the initiative to participate in an exercise program and may be more health conscious or health aware than other groups.

LIMITATIONS

The limitations of this study include the lack of racial and ethnic diversity. The location of the conducted focus groups is also a limitation, as focus groups conducted in other areas outside of the Midwest may have yielded different responses about technology. All participants were relatively well educated, as all participants reported completing high school. It is possible that older adults with less education may have different views on technology and may assess their future needs differently. A member check was not conducted with participants and is a limitation of this study.

NURSING IMPLICATIONS AND FUTURE RESEARCH

Understanding older adults’ per-
ceptions of technology is particularly beneficial to the nursing field. The United States is currently facing a nursing shortage that is only projected to increase with aging Baby Boomers (Cohen, 2009). To support this need, telehealth-care may serve as a viable solution to meet the needs of older adults with fewer resources in health care fields.

As this study did, future research should ask focus group participants to think about their current health needs or needs in the future, before directing the discussion toward technology. Participants may then better understand how technology can directly benefit them. Future focus group research should be conducted in other areas of the United States, including diverse populations (e.g., race, ethnicity), as well as various socioeconomic statuses. Cohort effects should also be examined, as different cohorts may have varying views on technology. Conducting focus groups concerning new technology products marketed toward older adults is likely to produce helpful opinions from older adults about the usefulness and usability of upcoming technology. Developers of technology and practitioners cannot and should not ignore the user perspective when developing and recommending various technologies. Acknowledging older adults’ perceptions can improve the user friendliness of technology and its acceptance rate.

The diffusion of innovations theory offers strategies and ideas for designers and developers of new technology. In particular, designers should consider whether or not a device is compatible with an older adult’s lifestyle, the complexity of the device (i.e., eliminating features that are unwanted by older adults), and the relative advantage older adults would have for using the technology (i.e., saving time and energy). Such factors either encourage or discourage technology use. Providing opportunities for older adults to observe the technology being used by others or trying out a piece of technology on a trial basis (e.g., 30 days without paying for the device) may also prove useful in encouraging technology adoption.

To increase awareness about what kinds of technologies are available to older adults, demonstrations in communities (e.g., senior centers, congregate meal sites, exercise groups) may be useful. Opportunities that allow for hands-on opportunities to test out and experiment with devices are likely more advantageous than passive demonstrations with videos and manuals, as more active learning may occur when older adults can physically touch and use technology. Providing support systems after technology has been introduced is also necessary, as older adults may have questions and concerns. Training peer leaders within the community allows older adults to support one another and encourage technology use. Likewise, older adults may be more inclined to trust a peer who is successfully using technology and can explain it in familiar terms, without excessive technical jargon.

**CONCLUSION**

Based on the results of this study, we conclude that, overall, older adults are not negatively biased toward technology. In fact, the older adults in this study were eager to explain how they used technology in their everyday lives and expressed a desire to find out about additional products on the market. However, apprehension about technology was clearly noted and often voiced in usability concerns and frustrations. In the future, technology developed and marketed with older adults in mind will be most successful and can help older adults achieve greater independence and quality of life.

**REFERENCES**


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