

SYMPOSIUM

General Symposium

N. CHARNES (Convenor). *Use of gerontechnology to support "successful aging"*. *Gerontechnology* 2018;17(Suppl):28s; <https://doi.org/10.4017/gt.2018.17.s.028.00> **Participants** W.R. BOOT (USA), S.J. CZAJA (USA), W.A. ROGERS (USA), J. SHARIT (USA), H-W. WAHL (GERMANY), J-S. YOON (SOUTH KOREA). **Issue** Gerontechnology products and services have the potential to promote successful aging. Yet, there are significant barriers to successful design and deployment that need to be addressed. The Center for Research and Education on Aging and Technology Enhancement (CREATE) is an interdisciplinary team of psychologists and engineers that focuses on the design and use of technology by aging adults. **Content** Our symposium presents CREATE research findings in the domains of healthcare, work, social engagement, cognitive engagement, and maximizing the potential and uptake of technology. **Structure** Boot et al. discusses results from two large (n=300) studies of attitudes toward the use of video and brain games. They show that older adults believe in the efficacy of brain games and are more willing than younger adults to devote significant time to training with them. An intervention study found personality and gender predicted actual game adoption. Czaja et al. discusses the results from a clinical field trial that used a carefully designed computer system and training package to counteract social isolation and loneliness in a large (n=300) diverse sample of USA seniors age 65-98. Seniors rated the system highly in terms of usability and functionality, had success in training, and the system led to positive changes in social connectivity. Rogers et al. describes a literature review of adoption of health technology by older adults, leading to a focused model of healthcare technology acceptance to guide understanding of older adults' initial intentions to use a healthcare technology for self-management. Important factors uncovered include usability of the product, the instructional support provided for learning, and the degree to which the functionality provides continued value over time (perceived benefit). Sharit et al. discuss studies concerning technology impacts on work for older adults. The first examined manager attitudes toward older workers finding both positive and negative attitudes with more experienced managers having more favorable attitudes to older workers. The second study examined 35 unemployed adults ranging from 50-71 years of age who were given a training program on Excel. Most participants found the program useful and performance depended in part on reasoning ability and processing speed. The potential impact of artificial intelligence advances on work fragmentation will also be discussed. Yoon et al. discusses how age and frailty interact to predict technology adoption and use. They formulate a path model to describe the relationships using a large (n=1000), diverse, life-span sample collected across CREATE sites. Prof. Hans-Werner-Wahl, University of Heidelberg, will act as the discussant, bringing a European perspective on technology adoption and use. **Conclusion** Multidisciplinary teams can create synergies to support effective large-scale projects. Such collaborations can generate evidence-based guidelines for designing, training, and deploying gerontechnology products that promote well-being in aging populations.

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W.R. BOOT, E.R. HARRELL, R. ANDRINGA, N.A. ROQUE, B.V. KMETZ, S.J. CZAJA, J. SHARIT, W.A. ROGERS, N. CHARNESS. *Motivation and correlates of older adults' engagement in video and brain games. Gerontechnology 2018;17(Suppl):29s; <https://doi.org/10.4017/gt.2018.17.s.029.00>* **Purpose** Video gaming is a popular leisure activity that relatively few older adults have adopted. At the same time, many cognitive and health interventions, some of which are aimed at older adults, have been gamified to increase acceptance and adherence. This talk will explore barriers to older adults' acceptance and adoption of video and brain games and their motivations related to gameplay through a review of three recently completed studies conducted by the *Center for Research and Education on Aging and Technology Enhancement (CREATE)* and collaborators. **Method** In one study, 373 younger and older adults were surveyed regarding their beliefs in the effectiveness of brain games¹. This study found that people, especially older adults, were optimistic regarding the benefits of brain games. Older adults believed that brain games could improve memory, concentration, distractibility, reasoning ability, multi-tasking, and could even improve the performance of everyday tasks such as driving. In another recently completed study, 337 adults between the ages of 20 and 73 were asked how much time they were willing to devote to brain training in order to extend their independence. Respondents indicated that they were willing to invest a significant amount of time every day to brain training. Older adults were more willing to allocate time toward brain games compared to younger adults, and the amount of time one was willing to invest increased with perceived cognitive deficits (controlling for age). A final study explored older adults' adoption of video games when provided with technology and training.² As part of an intervention targeting social isolation, participants were presented with the opportunity to play 11 different video games. Many older adults became active gamers, and game preference and amount of gameplay was predicted by individual difference factors such as gender and personality. Use of the computer system designed to reduce social isolation appeared to be facilitated by the presence of games on the system. **Results & Discussion** Results suggest that many older adults are willing and able to engage in video game play over an extended period of time, contrary to many stereotypes about aging and gaming. Further, older adults were especially optimistic regarding the potential cognitive benefits of gaming and reported being willing to invest a significant amount of time to gaming to achieve cognitive benefits. Even though older adults, on average, have little video game experience, these results suggest that brain games and interventions that include video games as a component are appealing to many older adults, and this could encourage technology adoption and intervention adherence.

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S.J. CZAJA, J. SHARIT, W.A. ROGERS, N. CHARNESS, W.R. BOOT. The role of technology in supporting social engagement among older adults. Gerontechnology 2018;17(Suppl):30s; <https://doi.org/10.4017/gt.2018.17.s.030.00>

Purpose Social isolation and loneliness are prevalent among community dwelling older adults especially those who live in rural locations, have mobility restrictions, are in the older cohorts or live alone. Isolation and loneliness are also common among older adults living in assisted living facilities or other types of residential institutions such as nursing homes. Social isolation and loneliness represent significant health risks and have been linked to cognitive declines, lower quality of life, a heightened risk for physical and mental health problems, functional declines, and mortality. Being isolated and lonely also negatively impacts on quality of life and the ability of older people to live independently. Problems with isolation and loneliness will become more prevalent with the increase in the oldest old population. Technology applications such as the email, social media sites and online support groups hold promise in terms of enhancing engagement and providing support to older people in various contexts and mitigating the negative impact of isolation and enhancing quality of life. Recent data indicate that use of these types of applications is increasing among older adults but there is still an age-related digital decline. This presentation will present findings from CREATE and other trials regarding the access to and use of these applications among older adults and the resultant impact on the social connectivity, loneliness and social support. **Method** We will highlight the PRISM randomized field trial that examined the benefits of a computer system designed to support access to information, engagement, and social connectivity among older people. The sample included 300 diverse older adults from three cities in the United States, aged 65-98 with no or very limited computer experience. The participants were also “at risk for isolation.” They lived alone and had limited or no work or community involvement. PRISM included: Internet access (with vetted links to sites such as NIHSeniorHealth.Gov), an annotated resource guide, a dynamic classroom feature, a calendar, a photo feature, email, games, and online help. PRISM was designed using a user-centered design approach, which involved representative samples of older adults in the design and development of PRISM. **Results & Discussion** The findings from the trial were encouraging. We were able to train all of the participants and use of the PRISM system also had a positive impact on social isolation, social support and well-being. Participants who used PRISM also demonstrated significant gains in computer proficiency and reported more computer self-efficacy and comfort with computers. The participants also reported that they enjoyed using PRISM, that it was easy to use and that use of PRISM enhanced their ability to connect with family and friends. In this presentation, we will also discuss barriers to access and challenges regarding the use of technology applications, such as lack of access, usability issues, cost, and privacy concerns. In addition, we will highlight needed areas of future research to maximize the potential benefits of technology with respect to enhancing social engagement and minimizing problems with loneliness and isolation.

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W.A. ROGERS, M.T. HARRIS. *Maximizing the potential and uptake of healthcare technology. Gerontechnology 2018;17(Suppl):31s; <https://doi.org/10.4017/gt.2018.17.s.031.00>* **Purpose** There is a plentitude of new technologies being developed that will purportedly improve the lives of older adults. Critical to the success of these developments is the adoption and integration of the technologies into the everyday activities of older adults. One area where there may be the most benefit is in the context of healthcare. According to the Center for Medicare and Medicaid Services¹, older adults are affected at high rates by hypertension (55%), hyperlipidemia (45%), arthritis (29%), ischemic heart disease (27%), diabetes (27%), chronic kidney disease (CKD; 17%), depression (16%), heart failure (14%), and COPD (11%). Consequently, older adults are increasingly called upon to engage in health self-management that may involve medication and diet adherence; exercise; use of medical technologies (e.g., activity monitor, blood glucose meter); and interaction with the formal healthcare system. Healthcare technologies such as mobile apps, health monitors, telehealth systems, and personal robots have the potential to support health self-management. However, the rate of adoption of such technologies is typically slower for older adults. Our research goal was to understand the factors that influence intentions, adoption, and long-term use of healthcare technologies by older adults. **Method** We conducted a systematic review of the literature to identify the factors that are specifically relevant for: older adults, healthcare technology, and adoption over time (initially and for extended use). We considered healthcare technologies broadly to include those designed specifically for health conditions (e.g., a blood pressure monitor) as well as those that support wellness more generally (e.g., an activity tracker). The purpose of the review was to identify studies that were specifically focused on the technology potential for health self-management for older adults. **Results & Discussion** There are many models of technology acceptance, perhaps too many, in the sense that it is difficult to determine what is most relevant for this user group, this type of technology, and integration into everyday activities. Based on our review, we developed a focused model of healthcare technology acceptance to guide understanding of older adults' initial intentions to use a healthcare technology for self-management. Missing from the literature were considerations of advice (who is suggesting they use the technology), as well as safety/trust/security issues. Our review also provides insights about what variables influence initial and continued use of healthcare technologies – key factors include the usability of the product, the instructional support provided for learning, and the degree to which the functionality provides continued value over time (perceived benefit). These findings provide guidance for the deployment of healthcare technologies for older adults to increase the likelihood that they will be adopted and provide support for health self-management.

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J. SHARIT, S.J. CZAJA. *The role of technology in supporting older workers. Gerontechnology 2018;17(Suppl):32s*; <https://doi.org/10.4017/gt.2018.17.s.032.00> **Purpose** Over the next few decades, changes in many work processes are expected, whether they be in manual work or in knowledge work, with many of these changes likely to be governed by new developments in technology. An important societal challenge as these transformations unfold will be the accommodation of an anticipated growing older worker population. This presentation will present some findings from previous CREATE activities that addressed the potential employability of older workers as teleworkers from a managerial perspective, and using instructional strategies targeting older learners to explore the feasibility of training job-seeking older adults on Microsoft's Excel application. The presentation will then explore other ways in which technology can impact the employability of older workers in both the manual and knowledge work domains. **Method** The main findings from two studies will be summarized. The first study examined older worker employability as teleworkers using an online questionnaire directed at managers encompassing different levels of managerial experience. The respondents rated the importance of 13 work-related attributes that were considered relevant to the ability to perform work remotely, and then compared older workers to younger workers on each of these attributes. The second study will highlight an academic-community partnership that was formed to examine the feasibility of teaching Microsoft's Excel application to employment-seeking older adults lacking knowledge of computer applications using a multimedia-based training program based on principles of instruction applicable to older learners. The presentation will then focus on ways in which technology could shape future work processes and the implications of these technological developments for the employability of older workers. **Results & Discussion** 314 managers responded to the online telework questionnaire. The results indicated the existence of both positive and negative attributes associated with employing older workers as compared to younger workers in remote work arrangements, and that more experienced managers tended to favor older workers. The findings from 35 unemployed adults ranging from 50-71 years of age who were given the training program on Excel indicated that there was an almost equal number of good and poor performers; that reasoning ability and processing speed were predictive of performance; and that most of the participants found the instructional program beneficial. Lessons were learned that could hopefully improve the prospects of training such individuals on these types of applications. Finally, the role of artificial intelligence in reshaping jobs and the implications of such changes on the employability of older workers will be discussed, including how a gradual increase in the number of activities comprising jobs that will be capable of being automated could potentially lead to the fragmentation of jobs. The prospects of work process changes leading to a greater amount of meaningful work as automation might replace more routine or repetitive tasks will also be discussed.

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J.-S. YOON, N. CHARNNESS, S.J. CZAJA, J. SHARIT, W.A. ROGERS. *Frailty moderates the relationship of age and technology use: Findings from the Center for Research and Education on Aging and Technology Enhancement (CREATE). Gerontechnology 2018;17(Suppl):33s; <https://doi.org/10.4017/gt.2018.17.s.033.00>* **Purpose** Physical frailty can leave older adults in a vulnerable state that results in adverse health outcomes and social isolation. The successful adoption of gerontechnology has potential for mitigating the possible problems associated with physical frailty in older adults¹. However, recent studies and national surveys report that the use of technology in older adults decreased with greater disability and/or a higher level of frailty in spite of overall increase in technology use in older adults in the United States^{2,3}. Our research goal was to investigate if and how frailty would influence technology use in older adults. **Method** Based on a model from CREATE I¹, the current study generated a path model assessing the effect of age on technology use and the interaction of age with frailty over and above education level in the CREATE II sample. We measured Frailty using the 10-item Physical Functioning Scale selected from SF-36, which asks participants to determine if health conditions limited their ability to complete several activities of daily living. Similar to theoretical frameworks proposed to explain technology adoption (e.g. UTAUT⁴, TAM⁵), behavioral intention was also included in the path model for assessing if intention to use would mediate the effect of age. **Results & Discussion** The current model showed that age significantly accounted for the use of technology over and above the other factors, indicating that older adults were less likely to use technology compared to young adults. Although frailty was not directly associated with the use of technology, the level of frailty significantly moderated the effect of age on the use of technology. Specifically, higher levels of frailty strengthened the negative relationship between age and technology use. Additionally, behavioral intention to use a computer significantly predicted the use of technology. However, the effect of age on technology use was not mediated by the behavioral intention. Consistent with the CREATE I model, education was still significantly linked to the use of technology and the behavioral intention to use computer, indicating that higher levels of education were associated with greater intention and use. The findings are discussed in terms of the frameworks of technology adoption and the necessity to facilitate technology use for older adults with functional limitations.

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