**International perspectives on technology use: Adoption, proficiency, and relationships with health and well-being**

W. Boot (Convener)

**Participants***:* A. Schlomann (Germany), K. Prevodnik (Slovenia), W. Boot (USA), S. Taipale (Finland).**ISSUE** Technology has massive potential to improve the lives of older adults across a variety of living domains, yet technology use and adoption tend to lag among older adults relative to younger cohorts, especially among the oldest-old. This is a pattern that can be observed throughout the world. As a result, many older adults do not reap the many benefits of newer technologies. **CONTENT** Our symposium is designed to bring together international speakers to present an overview of these issues in four countries to highlight: 1) commonalities of these problems across culture; 2) unique differences; and 3) ways in which technology can improve the lives of older adults when barriers to use and adoption are overcome. **STRUCTURE** Schloman first examines the relationship between ICT use and well- being in the oldest-old in Germany, finding a positive influence. Next, Prevodnik and colleagues examine the perceived benefits of telemonitoring systems for the ageing population in Slovenia, as a function of system acceptability and usability. Finally, Boot presents a broad overview of issues of technology use and adoption among older adults in the U.S., with specific recommendations for how barriers can be overcome, and a focus on newly emerging technologies including virtual reality and artificial intelligence. **CONCLUSION** The digital divide and the causes and consequences of this divide are consistent in different countries and living domains, and across a variety of technology solutions. However, the potential of technology to benefit individuals can be realized by older adults when technology and technology training account for the unique needs, preferences, abilities, and attitudes of older adults.

**Keywords:** digital divide, cross-cultural, technology adoption, telehealth, leisure, oldest-old

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**Relationships between ICT use and subjective well-being among the oldest-old in Germany: Findings from the NRWBO+ study**

A. Schlomann, A. Seifert, S. Zank, C. Woopen, C. Rietz

**Purpose** The use of information and communication technologies (ICT) can foster interconnected-ness and social inclusion for older adults. In particular, web-connected ICT (e.g., smartphones, tablets) facilitate high levels of interaction and a broad access to digital information and services. (Czaja et al., 2018). While research has demonstrated positive associations between web-connected ICT use and older adults' well-being (Cotton, 2017; Hofer et al., 2019), there is limited knowledge for the group of the oldest-old (80+). We analyzed the relationships between ICT use and subjective well-being in this underexplored group. **Method** Our findings are based on data from the NRW80+ study. NRW80+ is the first representative state-wide survey study on quality of life and subjective well-being of the oldest-old under-taken in the federal state of North Rhine-Westphalia (NRW) in Germany (Wagner et al., 2018). Multi-stage sampling was applied with a random sample of individuals aged 80 years and older living in private homes and institutional settings (n = 1863, mean age: 85.61 years, age range: 80-103). We conducted multiple regression analyses to compare different user groups of ICT (non-users, users of non-web-connected ICT, users of web-connected ICT) and analyzed their levels of subjective well-being with a focus on loneliness, anomie, and autonomy. **Results and Discussion** In total, 25.9% (n = 440) of all individuals aged 80 years and older reported using web-connected ICT, in contrast to 38.5 °/c) (n = 653) who do not use ICT at all (see Table 1 for individual characteristics of the groups). ICT use explained a significant amount of variance within the oldest-old's levels of subjective well-being (range of R2: .02-.23). Our results demonstrate that about two thirds of the oldest-old in NRW use ICT in their everyday life and that the use of ICT can have an independent effect on selected domains of well-being. Still, many older adults lag behind in the ownership of web-connected ICT. We argue, that the differences in technology adoption can lead to new inequalities in society and may have a negative impact on the oldest-olds' well-being. Technology training with attention paid to the technological skills and special learning needs of the oldest-old should be offered to over-come technology-induced constraints of subjective well-being.

**References**

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| Cotten, S. R. (2017). Examining the roles of technology in aging and quality of life. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 72*(5), 823-826.Czaja, S. J., Boot, W. R., Charness, N., Rogers, W. A., & Sharit, J. (2018). Improving social support for older adults through technology: Findings from the PRISM randomized controlled trial. *The Gerontologist, 58*(3), 467-477.Hofer, M., Hargittai, E., Büchi, M., & Seifert, A. (2019). Older adults’ online information seeking and subjective well-being: The moderating role of Internet skills. *International Journal of Communication, 13*, 4426-4443.Wagner, M., Rietz, C., Kaspar, R., Janhsen, A., Geithner, L., Neise, M., ... & Zank, S. (2018). Quality of life of the very old. *Zeitschrift für Gerontologie und Geriatrie, 51*(2), 193-199. |  |

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**The importance of user experience for psychosocial impacts of telemonitoring system utilization**

K. Prevodnik, S. Hvalič-Touzery, V. Dolničar, M. Škafar, A. Petrovčič

**Purpose** There is ample evidence of telehealth services being beneficial for managing patients with chronic diseases such as diabetes and hypertension. They do not only facilitate and im-prove data sharing and real-time communication between care professionals and patients with long-term conditions, but can also support patients' self-management of health that results in more safe and comfortable life at home over a prolonged period of time (Uei et al., 2017; Cartwright et al., 2017; Dolničar al., 2017). Surprisingly, there is a lack of research that would empirically investigate the relationships between acceptability, usability and the self-assessed benefits of telemonitoring systems (TMSs) for patients with chronic diseases (Goodwin, 2010). Hence, this paper will present the results of an intervention study in Slovenia that explored how user experience (UX) of patients using home TMS affects their self-evaluation of its utilization over an extended period of time. **Method** Ninety-five patients with diabetes (n=l 7), or hypertension (n=54) or a combination of the two (n=33), defined as a primary disease, received the home TMS and tested it for 3 months. All participants (age range: 35-76 years) in the non-probability sample were recruited in a Health Centre by health professionals who actively participated in the intervention. The UX of the home TMS was evaluated with two standardized survey instruments (TUQ, SUTAQ), while the psychosocial impacts of TMS utilization were measured with the PIADS-10 questionnaire. Structural equation modelling was used to examine relationships between the perception of psychosocial impact of the TMS use, the evaluation of acceptability, usability and the intent for future TMS use, based on a theoretical model. **Results and Discussion** The study demonstrates that in our sample of patients with diabetes and/or hypertension, the psychological impacts of home TMS utilisation were influenced by its usability but not by its acceptability, regardless of patients' (control over) health and frequency of TMS use. The intent for future TMS use is directly influenced only by the usability of the service tested.

**References**

Cartwright M, Hirani SP, Rixon L, et al. Effect of telehealth on quality of life and psychological outcomes over 12 months (Whole Systems Demonstrator telehealth questionnaire study): nested study of patient reported outcomes in a pragmatic, cluster randomised controlled trial. 2013.

Dolničar V, Petrovčič A, Setinc M, et al. *Understanding acceptance factors for using e-care sys-terns and devices: Insights from a mixed-method intervention study in Slovenia*. Springer Verlag; 2017.

Goodwin, N. (2010). The state of telehealth and telecare in the UK: prospects for integrated care. *Journal of Integrated Care, 18*(6), 3-10.

Uei, S. L., Kuo, Y. M., Tsai, C. H., & Kuo, Y. L. (2017). An exploration of intent to use telehealth at home for patients with chronic diseases. *International Journal of Environmental Research and Public Health, 14*(12), 1544.

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**Trends and benefits of information and communications technology use for older adults in the United States**

W. Boot

**Purpose** In the United States, in 2019, still 25% of older adults (65+) are not on line, and 47% of older adults do not own a smartphone, compared to near universal adoption of these technologies by younger cohorts (Pew Research Center, 2019). A variety of barriers exist that account for this digital device, including age-related difference in cognition, attitudes, technology self-efficacy, experience, and proficiency (Charness & Boot, 2009; Czaja et al., 2006; Chen & Chan, 2014). This talk will examine factors related to this digital divide, methods through which it can be overcome, and how overcoming these barriers can enhance the lives of older adults in multiple domains. **Method** Data from the Pew Research Center 1s Internet & American Life Project, and other sources (RAND, CREATE Center), will be summarized to contextualize older adults' technology use and barriers to use in the United States. Then, an overview of design methods to overcome barriers will be provided. This will be followed by specific instances of how these methods have been applied to design technology, or train technology use, in ways that promote the successful adoption and use of technology in multiple domains, including health, social connectedness, and leisure. A special emphasis will be placed on issues surrounding newly emerging technologies, including virtual and augmented reality, as well as artificial intelligence. **Results and Discussion** With well-designed technology, and a design process that includes older adults, many of the barriers associated with technology use and adoption can be minimized. However, in many parts of the United States, additional barriers exist, including lack of sufficient infrastructure that can effectively support technology solutions.

**References**

Charness, N., & Boot, W. R. (2009). Aging and information technology use: Potential and barriers. *Current Directions in Psychological Science, 18*(5), 253-258.

Chen, K., & Chan, A. H. S. (2014). Gerontechnology acceptance by elderly Hong Kong Chinese: a senior technology acceptance model (STAM). *Ergonomics, 57*(5), 635-652.

Czaja, S. J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S. N., Rogers, W. A., & Sharit, J. (2006). Factors predicting the use of technology: findings from the Center for Research and Education on Aging and Technology Enhancement (CREATE). *Psychology and Aging, 21*(2), 333.

Pew Research Center (2019). Mobile Fact Sheet. Retrieved from http://www.pewinternet.org/fact-sheet/

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