

ORAL SESSION 3: PERSONAL MOBILITY

SmartDrive: A self-assessment app to steer the conversation about safe driving for older adults

S.S. Neti, A. Kirakalaprathapan, J.R.H. Lee, J. Boger.

Neti et.al (2020). Gerontechnology 19(suppl); <https://doi.org/10.4017/gt.2020.19.s.70124>

Purpose As people age, changes in cognition can affect their ability to perform day-to-day activities such as driving (Eberhard, 2008). Studies have found that older drivers have higher crashes per mile driven and are more vulnerable to injuries due to fragility (Li, Braver & Chen, 2003). The age-old question: “When should I hang up my keys?” becomes one of balance between personal autonomy and public safety. To address this, we’ve developed SmartDrive, an application to support older adults with self-assessing their driving and begin planning for driving cessation, when the time comes. **Method** After reviewing literature on clinical practices for driving-assessment, three cognitive tests that were significantly correlated with on-road driving were digitally implemented: Porteus Mazes, Trail Making Test (Part B) (Classen, Wang, Crizzle, Winter & Landford, 2013) and Useful Field of View (Classen, Wang, Crizzle, Winter & Landford, 2013). The preliminary prototype was pilot-tested with six actively driving older adults. The app was re-designed and re-evaluated based on participant feedback. Following the COVID-19 pandemic, the second version of the app and the study were shifted online. Through the Waterloo Research of Aging Participant Pool, 16 actively driving older adults (avg age: 74.3 yrs.) were recruited. As part of Phase 1, cognitive walkthroughs of the app were performed and semi-structured interviews discussing the usefulness of the feedback (scores, recommendations, etc.) and the usability of the design (language, layout, colors, etc.) were conducted. Currently the research team is thematically analysing the transcripts to identify emergent themes using inductive and deductive coding techniques. These themes will be translated into design features that can be implemented in the next version of SmartDrive. As part of Phase 2, the revised version of the application will be evaluated through interviews with eight participants in mid-June. **Results and Discussion** From the previous analysis of the pilot study data, we recognized five predominant themes that influenced the older adults’ willingness to use the application: ‘Awareness’, ‘Motivations for use’, ‘Accessibility’, ‘Trustworthiness’ and ‘Action plan’. Our study focuses on expanding this list of themes, as well as identifying, designing and evaluating the design changes that would improve the user experience and effectiveness of the app. Another objective of SmartDrive is to prompt the user to explore a ‘driving plan’ for the future. We aim to support an active approach towards driving decisions by providing practical suggestions to the user. We hypothesise that through periodic self-assessment and early planning for driving cessation, SmartDrive can promote safer driving decisions and help reduce crash risk amongst older adult drivers.

References

- Classen, S., Wang, Y., Crizzle, A. M., Winter, S. M. & Lanford, D. N. (2013). Predicting older driver on-road performance by means of the useful field of view and trail making test part B. *American Journal of Occupational Therapy*, 67(5), 574-582. <https://dx.doi.org/10.5014%2Fajot.2013.008136>
- Eberhard, J. (2008). Older drivers' “high per-mile crash involvement”: The implications for licensing authorities. *Traffic injury prevention*, 9(4), 284-290. <https://doi.org/10.1080/15389580801895236>
- Li, G., Braver, E. R. & Chen, L. H. (2003). Fragility versus excessive crash involvement as determinants of high death rates per vehicle-mile of travel among older drivers. *Accident Analysis & Prevention*, 35(2), 227-235. [https://doi.org/10.1016/s0001-4575\(01\)00107-5](https://doi.org/10.1016/s0001-4575(01)00107-5)

Keywords: driving, self-assessment, older-adults

Address: University of Waterloo, Canada

Email: ssneti@uwaterloo.ca



Figure 1. Screenshots of SmartDrive welcome and task screens