Mobility and Transport

Profiles of Mature Drivers and Their Trust in Telematics-Based Safety Technologies K. Van Benthem, B. Wallace, L. McCauley, J. Keillor, S. Marshall, F. Knoefel, T. Friedman, and C. Herdman. *Gerontechnology* 25(s)

Purpose Telematics and app-based feedback systems are promoted to support safer driving[1], yet mature drivers in the clinic may perceive these tools as surveillance that threatens autonomy and privacy. The purpose of this online study was to identify distinct profiles of mature drivers and examine how concerns about security, privacy, and fear of consequences shape their willingness to engage with telematics technologies. We hypothesized that mature drivers would cluster into at least two meaningful groups based on technology attitudes, data-sharing preferences, trust in telematics, and concerns related to privacy and risks of data abuse. Our aim was to translate these class differences into promotional and design guidance for gerontechnologies that are acceptable to drivers and supportive of autonomy. **Method** We conducted a national online survey of 384 licensed Canadian drivers aged 55–98 years. The survey captured self-reported demographics, living situation, driving history, exposure, and contexts, driving confidence, wellness conditions affecting driving, and self-regulatory driving behaviours, in addition to their perceptions about vehicle technology and security. Gaussian mixture models with two- and three-class solutions were estimated and compared using established information criteria. The classes were profiled using class-specific means and proportions for technology acceptance, security, privacy and consequence-related attitudes. **Results** Information criteria comparisons supported a three-class solution. Classes were statistically similar in age, gender distribution, living and driving contexts, and annual kilometres, and all reported high self-rated driving confidence (means in the mid-4s on a 5-point scale). Vision conditions affecting driving were uncommon and did not differ meaningfully across classes. Regarding class distinctions, Class 1 (45%) comprised *telematics-engaged tech users* who frequently used navigation and in-vehicle safety features. This class expressed the highest acceptance of telematics, generally, and had relatively low concern about data sharing when framed in the context of enhancing safety and independence. They reported few health-related limitations and their driving challenges were situational (e.g., night or bad-weather driving). Class 2 (31%) included *cautious, selectively-engaged tech users* who used some in-vehicle technologies, but had the most concerns over its use (See Figure). They endorsed privacy and preferred bounded, controllable feedback (choosing what is tracked, how often feedback is given, and who can view it). The tech-cautious drivers also reported specific challenging driving situations, favouring targeted rather than open-ended support. Class 3 (24%) consisted of *reluctant- or low-tech drivers* who favoured minimal technology, were least interested in telematics solutions to safety, and expressed discomfort with tracking and potential licence consequences. Despite this, they reported confidence and health profiles similar to the other classes and managed challenges primarily through behavioural self-regulation (e.g., avoiding night or heavy traffic) rather than adopting new tools. **Discussion** Variability in telematics adoption was influenced more by attitudes toward surveillance, privacy, and control over personal data rather than by health status, driving ability, or by driving context (e.g., urban versus country, thus helping to generalize these findings across countries). Understanding the concerns patients hold about driving technologies—particularly as they intersect with driver assessment and rehabilitation services—can support informed, individualized conversations and encourage the adoption of tools that enhance safety across the lifespan.

References

1. Gish, J., Vrkljan, B., Grenier, A., & Van Miltenburg, B. (2017). Driving with advanced vehicle technology: A qualitative investigation of older drivers' perceptions and motivations for use. *Accident Analysis & Prevention, 106*, 498-504.

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