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Driving fitness in the elderly -- validation of visual and driving-aptitude tests

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Safe driving in traffic requires visual and cognitive abilities. The present study's aim was a validation of apparatus and methods of testing vision and cognitive aptitude with driving competence as validity criterion. We collected extensive data in a group of elderly drivers (n=151, median age 70), assessing foveal acuity, perimetric field size, peripheral vision ("PP") in Schuhfried's Vienna Test System (VTS), letter contrast thresholds in foveal and parafoveal vision, and a series of driving aptitude tests on the VTS. As validity criterion served ratings by driving instructors and trained observers in a standardized test drive. It included lane changes, motorway entering/exiting, orienting, and situations of right-of-way. Driving competence decreased overall with increasing age (15% explained variance), probably due to diminishing practice. Eighty percent of explained variance were person-specific and age-independent, stressing the importance of assessing fitness individually. Cognitive tests on the VTS had considerably higher predictive value than visual parameters; best singular predictor was lane tracking (20%). For visual-cognitive performance, Schuhfried's dynamical peripheral vision test and parafoveal letter contrast sensitivity were best (9% each). Acuity and kinetic perimetry – both typically required by regulations – were of rather limited importance.