

# A simulated test-ride to assess the driving ability of cognitively impaired persons

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## Abstract

For elderly and neurologically impaired people, the issue of fitness to drive is an important question as car driving enhances mobility and independence in daily life. However, given the possible decline of cognitive functions in these groups of people, the ability to drive safely should be carefully assessed. Licensing authorities have extensive experience in assessing the fitness to drive of physically impaired drivers, but existing assessment procedures fall short in case of the cognitively impaired driver. Neuropsychological test performance yields only modest correlations with driving behaviour, indicating the need for actual on-road evaluations. In an attempt to combine the merits of neuropsychological assessment (standardisation, reliability) and an on-road test (ecologically valid measures, behavioural observations), we designed a diagnostic test-ride in the driving simulator of the Traffic Research Centre (University of Groningen). Due to the implementation of intelligent traffic participants, the simulator provides a convincing driving environment, in which interaction with other cars can be studied and behavioural observations can be scored. Safety measures of driving can be obtained during test-rides. Difficulty level is gradually increased, while operational and tactical aspects of driving are registered. Specific situations are built-in that are demanding for people suffering from attentional or related cognitive impairments.

## Introduction

For elderly and neurologically impaired drivers, the issue of fitness to drive is an important question as car driving enhances mobility and independence in daily life. However, given the possible decline of cognitive functions in these groups of people, the ability to drive safely should be carefully assessed. The assessment of fitness to drive of neurologically impaired drivers is the focus of this paper. The paper starts with an overview of the practical and methodological difficulties in this field, focusing on the following aspects: fitness to drive of neurological patients, (in)validity of neuropsychological measures to assess fitness to drive, fitness to drive and accident risk, and assessments in driving simulators. This is followed by the discussion of a pilot study carried out in a driving simulator with several neurological patients. After that, a description is provided of the implementation and operationalisation of a new test-ride for neurologically impaired patients. It is