

# Effects of complexity of in-car information on visual fixations and driving performance

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## Abstract

In-car information should be easy to perceive and process, without distracting the driver from the driving task. The aim of the present study is to determine the effects of the number of pictograms displayed on the menu of in-car screen on the visual fixations and the driving task performances, taking into account the drivers ageing. For this study, a driving simulator equipped with in-car information system was used. On the in-car screen, a menu of different levels of complexity (2, 4, 6, 9, 12 and 16 pictograms) was displayed. The task of each driver was to find one specific pictogram among those displayed in the menu. The performances of visual fixations, swerving and driving speed were registered. A sample of 24 drivers (young and old) completed the tests. The results indicate a relation between the number of pictograms displayed and the number and duration of visual fixations, as well as the level of driving deterioration. Moreover, the duration of visual fixations and the lane deviations increase significantly with the age of drivers. This study concludes with ergonomic recommendations concerning the number of pictograms to be displayed on a menu of in-car information systems.

## Introduction

More and more vehicles are equipped with in-car information systems that display information in or near the dashboard. These systems have different functions, such as route navigation, radio and CD-player, and even maintenance indication of the vehicle. However, displaying this information can cause ergonomics problems and it is important to define and to create in-car multifunction instruments that are easy to read, to understand and to use. Moreover, the in-car information must not interfere with the primary task of driving. Most in-car systems require gathering of visual information, and these repeated glances (eye fixations) require shifts of attention from the primary task of driving to the in-car system. Some studies have shown that the complexity of in-car information influences the number and duration of visual fixations off the road and this could affect road safety (Wierwille

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