

Older drivers in Virtual Reality assessments of vehicle ergonomics

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Abstract

Virtual reality has exciting potential as a means for ergonomic evaluation of vehicle design. To take advantage of this potential it is necessary to establish that the use of virtual environments will produce valid results and be acceptable to the full range of vehicle users. Of particular concern are older drivers who, across Europe, constitute a significant and increasing population, with specific needs that must be accounted for. Drivers from three age groups took part in driving trials in a real car and in two simulator systems. Simulator validity was assessed using subjective and objective measures. The research illustrates some advantages of involving older drivers in simulator validations.

Introduction

Virtual reality has exciting potential as a means of involving users in vehicle design. The manufacture of physical prototypes of vehicles is a highly costly process. In virtual reality, prototypes could potentially be constructed at a fraction of the cost, enabling the involvement of users at earlier stages of design.

Across Europe older drivers constitute a significant and increasing population. Because of their particular characteristics, this group may differ from others in their responses to vehicle designs and also to simulator infidelities. This creates an imperative to involve older drivers in virtual reality assessments of vehicle designs and to ensure validity across a wide range of driver ages.

When a response variable takes values in simulator trials different from those obtained in real situations, this may indicate simulator infidelities that affect the results. However, if, in the simulator, the variable also shows patterns of variation (such as differences across participants ages) similar to those exhibited in real situations, we may conclude that the simulated situation also has relevant similarities with reality. The term "relative validity" (Blaauw, 1982) acknowledges this. We can say that a simulator possesses relative validity when, despite differences in absolute values, patterns of variation in a variable that occur in real situations also occur in