AB095. Development of an assessment system of driver visual behaviours on a car simulator

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Background: (I) To describe the development and components of the automobile simulator driving behavior evaluation system developed by CRIR-Institut Nazareth et Louis-Braille; (II) to present the preliminary results of the content evaluation of the driving behavior evaluation grid.

Methods: The evaluation system consists of five components: (I) the VS500M Car Simulator (*Virage Simulation*); (II) four VS500M driving scenarios, modified to minimize the occurrence of simulator sickness and expose subjects to commonly encountered driving situations on highways and city boulevards; (III) the *Tobii Pro Glasses 2* eye tracking device; (IV) a car simulator driving behavior observation grid (DBOG); (V) a software application used during the behaviour evaluation phase, where synchronized video tracking, certain data from the simulator (e.g., speed) and the DBOG grid are presented. Initially, the expected safe driving behaviors were identified, including 235 of a visual nature, supported by literature data and consultation of the project steering committee and an expert in driving assessment. Driving behaviors were assessed in 22 subjects without visual impairment (mean age 55±20 years). Subsequently, the items were revised to determine their relevance based on their importance in terms of road safety or on the frequency with which behaviors were observed among participants. For analysis purpose, the items of the DBOG were grouped according to their content, by type of expected driving behavior (e.g., following a stop, look to the left and right before crossing the intersection) or element to be detected (e.g., pedestrians).

Results: Some visual behaviors are difficult to observe with the eye tracker device because they are more dependent on peripheral than central vision. Others are rarely observed, possibly because they are little or not realized in daily life or the representation of reality on the simulator does not stimulate their adoption. On the other hand, the visual detection behaviors expected in a situation where safety can be compromised are mostly carried out (e.g., detection of oncoming vehicles, side mirror verification when changing lanes).

Conclusions: This first phase of the study has made possible to better target the items to be kept in the car simulator driving behavior observation grid, and those that will have to be removed as they are too difficult to observe or too rarely adopted by the participants. Content validity and inter-rater reliability will be assessed from the simplified grid.

Keywords: Car driving simulator; visual behaviours; assessment tool

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