

Peña-Suárez, E.

Gugliotta, A. A.

Ventsislavova-Petrova, P.

García-Fernández, P.

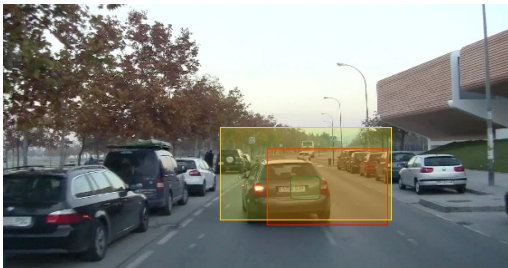
Padilla, J. L.

Castro, C.



Situation Awareness of Spanish Drivers: Measuring their accuracy in the Hazard Perception Test

Figure 1. Situation Awareness (Endsley, 1995). This is composed of three levels: perception of the elements in the environment, comprehension of their meaning and projection of their status in the near future.



Method

Participants

121 participants from Granada, SPAIN, took part in this study, (69 men and 52 women) with a mean age of 27.52 years. They were grouped according to their driving experience: (20 (16.5%) were learner drivers (18-37 years) who were attending lessons to obtain a driving licence for the first time, 62 (50.4%) were novice drivers (18-39 years), in possession of a driving licence and with less than eight years' driving experience, and 40 (31.1%) were experienced drivers (26-53 years) who possessed different types of driving licence); and by driving offences (non-offender and re-offender drivers, those who had lost their license points, partially or totally, according to the current Spanish penalty point system; 20 of the novices and 20 of the experienced drivers were re-offenders).

Procedure

Prior to the experiment, participants were provided with instructions and an explanation of how to answer the questionnaire. They all completed the demographic information form before the beginning of the experiment. The task was performed in groups: participants were seated approximately 3 to 5 m from the screen and were required to complete the response sheet in the booklet after watching each of the 16 videos.

Instruments

The test is a new and improved version of the previous one (Castro et al., 2014). This questionnaire contains brief demographic questions and a total of 16 response forms (1 page per video clip, the stimulus shown for getting participants' responses), including instructions on how to complete them.

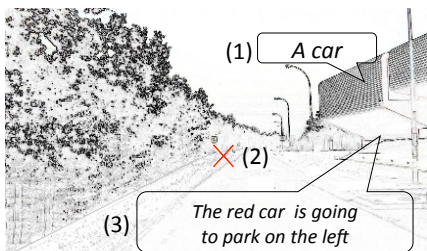
This instrument contains three questions to measure SA (Situation Awareness) in driving:

- (1) What is the hazard?
- (2) Where is it located?
- (3) What happens next (WHN)?

For 'What is the hazard?', participants had to give an exact description of the hazard.

For 'Where is the hazard?' participants were required to mark a cross on a pictorial representation of the last frame (without any hazard elements included).

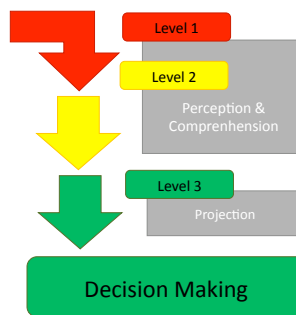
Finally, for the 'WHN?' question, participants had to give a description of what would happen next.



Aims

- To develop a reliable hazard perception test in the Spanish driving context.
- To explore the differences between drivers with different driving experience and different records of driving offences.

Situation Awareness



Universidad de Granada



Specific serious offences

Results

- The test was composed of eleven videos with discrimination indices above 0.30 and Cronbach's Alpha Coefficient of 0.75.
- There was a main effect of experience in the non-offender experience groups [$F(3,76)=3.356$ $p<.001$ η^2 $p=.117$]. Tukey's post-hoc analysis suggested that the average score in the hazard perception test was significantly lower for learner drivers than for expert drivers.
- There was a main effect of question [Wilk's Lambda= .464 $F(2,75)=43.371$ $p<.001$ η^2 $p=.536$], see Figure 2, which showed that the 'what' question was correctly identified significantly more often than the location or the 'what happens next?', and the 'where' question was correctly identified significantly more often than 'what happens next?'.
- The interaction term between experience and question was not statistically significant in this analysis [Wilk's Lambda= .884, $F(6,150)=1.586$ $p=.155$ η^2 $p=.060$].
- In the offender experience group, a significant difference was found only in the main effect of question [Wilk's Lambda= .309 $F(2,37)=41.281$ $p<.001$ η^2 $p=.691$].

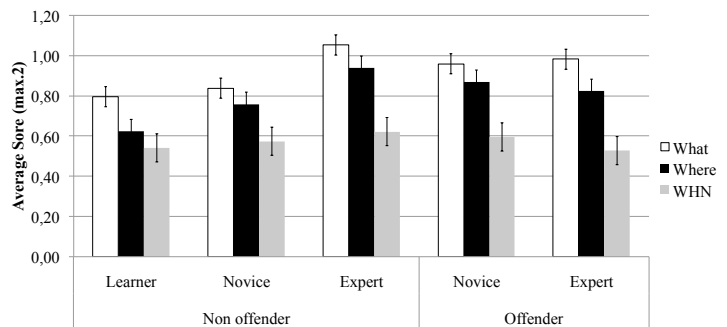


Figure 2. Mean total for question type by non-offender drivers showing error bars.

Conclusions

- This new test is reliable and it discriminates between different types of driver.
- It was found that driving experience improves hazard perception.
- Further research should explore why re-offenders are not safe drivers although they show an acceptable performance in the Hazard Perception Test.

References

- Castro, C., Padilla, J. L., Roca, J., Benítez, I., García-Fernández, P., Estévez, B., López-Ramón, M.F., and Crundall, D. (2014). A first development and validation of the Spanish Hazard Perception Test. *Traffic Inj. Prev.* 16, 1-10 DOI:10.1080/15389588.2013.879125
- Jackson, L., Chapman, P. and Crundall, D. (2009). What happens next? Predicting other road users' behavior as a function of driving experience and processing time. *Ergonomics*, 52 (2), 154-164.

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