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http://dx.doi.org/10.5339/qfarc.2016.SSHASP2405

Human Factors in Driving Accidents: A Cognitive Investigation in the Gulf Context

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Human factors were reported by researchers to be the reason behind the majority of car accidents; examples of these factors were: inattention, stress, distraction, decision making, drugs and alcohol abuses. Most of such studies were conducted based on western countries and on simulated driving situations, and very few of which used samples of participants who had accidents and/or driving violations in real life situations. To date, no studies at least in the Arab world generally and Gulf area specifically, conducted a comprehensive examination of cognitive functioning as potential predictors of car accidents and driving violations. Thus, the present study aimed at examining the role of cognitive functions (i.e., verbal working memory, attentional control, behavioral control, emotional control, cognitive failure, everyday memory failure, analytical cognitive style, mental planning, and general decision-making) as predictors of traffic accidents and driving violations. This was done based on empirical data from a hundred and thirty two men participants who aged between 24 and 31 years. All participants had driving licenses for more than five years and driving experiences of 8000000 KM and more. They were classified into violators and non-violators as well as accident free and accident involved groups. The cognitive functioning was measured using 5 self-reports and 2 tasks performance: Executive Functioning Scale, General Decision Making Scale, Cognitive Style Index, Cognitive Failure Questionnaire, Everyday Memory Questionnaire, Verbal Working Memory Task and Tower of London Task. A series of ANOVAS as well as stepwise multiple regressions were conducted to test the research hypothesis. Findings showed that there were significant differences between violators and non-violators and between the accident free and accident involved groups in almost all of the considered cognitive factors ($P < .01$), except for the decision making factor ($P > .05$). Results also indicated that the attentional control, behavioral control, emotional control, cognitive failure and mental planning factors were the major predictors of traffic violating behaviors and traffic accidents. Moreover, Pearson product-moment correlations showed that there were significant negative correlations between age, driving violations, and cognitive performance and the accidents. These obtained findings

Cite this article as: Alotaibi YN, Al sulaiti LA, Aljabri MS, Soliman AM. (2016). Human Factors in Driving Accidents: A Cognitive Investigation in the Gulf Context. Qatar Foundation Annual Research Conference Proceedings 2016: SSHASP2405 http://dx.doi.org/10.5339/qfarc.2016.SSHASP2405.

underscore the involvement of cognitive functioning in driving behavior and road accidents. Thus, when drivers working memory and/or executive functioning are overloaded, more demands on the cognitive recourses are imposed, which in result makes them vulnerable to wrong or hazardous driving decisions. It was also noted that those with higher mental planning abilities were involved in less moving violations and road accidents. This result was expected because as detected through the study, the more the time people take to move in the planning task, the more accidents and moving violations they report. It was also found that individuals with more driving mileage and holding driving licenses for a longer time period had more violations and driving accidents. In result, our findings contribute to the literature that human cognition such as executive functioning, mental planning and verbal working memory are key factors for predicting driving behavior and traffic accidents, and have many implications in diagnosing and preventing or at least reducing driving violations and road accidents.