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ABSTRACT BOOK



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baselines. Data analysis is at this time still in progress, complete data will be presented at the conference.

Concurrent Validity of Some Psychological Methods for Assessing Predisposition Towards Safe Driving

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The study verified the methodology of drivers' psychological testing regarding the validity and reliability of selected psychomotor and cognitive tests used in assessing drivers' predisposition towards safe driving: simple reaction, combined reaction, cross, R-W, Poppelreuter and Couvé tests. Three groups of drivers (n=1266), aged 21-74, participated in the study: professional and non-professional drivers never involved in heavy road crashes, and non-professional drivers – offenders in heavy road crashes. Validity was evaluated with criterion-oriented validity, whereas reliability with test-retest and split-half methods as well as Cronbach's alpha. The results showed statistical significant differences between drivers-offenders and drivers not involved in heavy road crashes in reflexes, attention, speed and dexterity of work and hand-eye coordination. Therefore, these features are critical for safe driving. Moreover, R-W, simple reaction and cross tests can be recommended as valid and reliable in assessing psychological predisposition towards safe driving. Furthermore, the ROC (receiver operating characteristics) curve suggests that standards permitting people to be professional drivers as well as non-professional drivers should be higher than current ones. Transport psychologists should discuss this problem.

Towards a definition of safety for individual driver's lane behaviour

van Loon, R.[1]
TNO, the Netherlands[1]

To assess lateral control performance in drivers, lane behaviour indicators such as the mean lane position, standard deviation of lane position and time-to-line-crossing are the most frequently used measures. For lane position, the commonly accepted (qualitative) proposition is that increased lane swerving indicates reduced vehicle control and hence a decreased level of safety. For time-to-line-crossing, a rule of thumb is that a value of less than 1s implies a decreased level of safety (e.g. an increased risk of lane exceedance). However, a quantitative relationship with safety similar to the one between speed and safety or between speed variability and safety does not yet exist for lane behaviour indicators. In the current study, we intend to establish a link between this type of driving behaviour in individual drivers and the level of safety, using data from both studies related to impaired driving and studies not related to impaired driving. The results from this study can be a first step in ultimately setting cut-off values for safe driving based on individual behavioural indicators.

Efficacy of Dynamic Traffic Management Measures: The Influence of Complexity and Situational Awareness

Hoogendoorn, R.[1], Vreeswijk, J., Hoogendoorn, S.P., Brookhuis, K.A., Van Arem, B., & Van Berkum, E.
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Behavior of road users (e.g. route choice, driving behavior) is a critical factor in the efficacy of measures applied in the context of Dynamic Traffic Management (DTM). In order for drivers to make well-informed decisions, it is required that information provided by DTM measures is perceived. In this regard, situational awareness is a psychological construct of high importance. Situational awareness is defined as the perception of elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future. With regard to the relationship between situational awareness and the efficacy of DTM measures three aspects are relevant: spatial awareness, system awareness and task awareness. A driving simulator study was performed to analyze to what extent complex interaction with other traffic and the complexity of DTM measures influence spatial awareness and system awareness. The complexity of interactions with traffic was simulated by the induction of speed changes of the lead vehicles. Whereas the complexity of DTM measures was induced by exposing participants to maximum speed limit signs and route information with an increasing level of complexity and ambiguity. Spatial awareness and system awareness were measured through eye fixations using a new data collection and analysis technique. Furthermore, a psycho-spacing car following model was estimated to measure spatial awareness, while the compliance to the DTM measures was considered another measure for system awareness. The influence of complex interactions with other traffic as well as of the complexity of DTM measures was analyzed through Multivariate Analyses of Variance.

Symposium - Driver behaviour modelling 1

Wednesday 29th of August, 16:00 - 18:00 - Blauwe zaal

Driving Behavior Model from the Brain Science point of view and the applications to safe-driving training program

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Many People have believed that human behavior is explained as cognition-judgment-operation loop. But recently, the brain scientists have been elucidating the fact that there is anticipation before cognition in the brain processing. The TP-theory (Temporal Predictive behavior model) is a model which applies anticipation-operation-comparison loop as new information processing with temporal frame to human behavior including car driving. Driving behavior is separated into five different levels of temporal anticipation windows. Each window consists of both feed-forward loop and feed-back loop. Why people feel stress in driving? Why people can synchronize traffic environment, or not? This TP-theory can also give answers for these questions from subjective (feelings) point of view, although the model is developed for human behavior. This article firstly gives the general explanation about the TP-theory. Next, one example is illustrated where we created and conducted curriculum for safety driving training based on the TP-theory, and the validity of the application of the theory is discussed.

Facets of driver behaviour: the benefit of hindsight

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Groeger (2000) identified four facets of driver behaviour which were hypothesised to underlie drivers' responses to risk: Detection, Option Appraisal/Evaluation, Response Selection and Action Implementation. Together these were thought of as incorporating cognitive, somatic and motor determinants of whether, how, and how successfully drivers might respond to risks of which they may or may not have awareness. In the decade since this framework was published a wide variety of results have been published which, I will argue, fit very well with the four facet framework, and can be used to make explicit not only the operation, interaction and the neurological underpinnings