

Assessing the Impact of Additional Information during Motor Preparation in Lane Change Task

Authors : Nikita Rajendra Sharma, Jai Prakash Kushvah, Gerhard Rinkenauer

Abstract : Driving a car is a discrete aiming movement in which drivers aim at successful extraction of relevant information and elimination of potentially distracting one. It is the motor preparation which enables one to react to certain stimuli onsite by allowing perceptual process for optimal adjustment. Drivers prepare their responses according to the available resources of advanced and ongoing information to drive efficiently. It requires constant programming and reprogramming of the motor system. The reaction time (RT) is shorter when a response signal is preceded by a warning signal. The reason behind this reduced time in responding to targets is that the warning signal causes the participant to prepare for the upcoming response by updating the motor program before the execution. While performing the primary task of changing lanes while driving, the simultaneous occurrence of additional information during the presentation of cues (congruent or incongruent with respect to target cue) might impact the motor preparation and execution. The presence of additional information (other than warning or response signal) between warning signal and imperative stimulus influences human motor preparation to a reasonable extent. The present study was aimed to assess the impact of congruent and incongruent additional information (with respect to imperative stimulus) on driving performance (reaction time, steering wheel amplitude, and steering wheel duration) during a lane change task. implementing movement pre-cueing paradigm. 22 young valid car-drivers (Mage = 24.1 +/- 3.21 years, M = 10, F = 12, age-range 21-33 years) participated in the study. The study revealed that additional information influenced the overall driving performance as potential distractors and relevant information. Findings suggest that the events of additional information relatively influenced the reaction time and steering wheel angle as potential distractor or irrelevant information. Participants took longer to respond, and higher steering wheel angles were reported for targets coupled with additional information in comparison with warning signs preceded by potential distractors and the participants' response time was more for a higher number of lanes (2 Lanes > 1 Lane). The same additional information appearing interchangeably at warning signals and targets worked as relevant information facilitating the motor programming in the trails where they were congruent with the direction of lane change direction.

Keywords : additional information, lane change task, motor preparation, movement pre-cueing, reaction time, steering wheel amplitude

Conference Title : ICTTP 2022 : International Conference on Traffic and Transportation Psychology

Conference Location : Montreal, Canada

Conference Dates : June 16-17, 2022