Modelling the Effects of Emotional States on Driving Speed and Crashes

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Abstract

Driving is a complex task requiring immense coordination between an individual's mental and physical faculties. Though it becomes automatic with practice and experience, the driver must constantly process stimuli from the environment and react accordingly. An individual's emotional state, both in terms of arousal and valence, plays a part in how drivers interact with the variables on the road while driving, which may significantly impact control during driving. The current study explores the influence of emotions, particularly pleasant, neutral, and unpleasant, on incidents of crashes and average driving speed. Emotions, particularly negative emotions, potentially impact decision-making and may lead to lower risk perception, leading to higher average speed and increased number of crashes. The hypothesis anticipates that the unpleasant emotional states of drivers may result in a higher speed and increased number of crashes. For emotion induction, 95 drivers were exposed to three sets of images - pleasant, neutral, and unpleasant, from the International Affective Picture System (IAPS). They were instructed to drive on a driving simulator while navigating challenging scenarios like pedestrian crossings and taking a right turn while judiciously measuring gaps between an oncoming traffic flow. Data analysis was done using linear mixed models, and the results suggested that emotions significantly impact the number of crashes and average speed. It also indicated a notable difference in the number of crashes and speed between pleasant and unpleasant states. The results align with the available literature that claims negative emotions can lead to more risk-taking behaviour and, thus, higher speed and crashes. This study can be used to predict drivers' behaviour, while different states of emotions and interventions can also be provided to enhance driving safety. n summary, the study emphasizes the pivotal role of emotions in influencing road safety. Keywords: Traffic Psychology, Emotions, Accident Prevention

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