

Title: Testing a new proposition explaining aggressive driving style in novice drivers: a slower assessment of risky road situations

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As the driving activity can be summarized succinctly as an avoidance task, anticipation of potential risks and obstacles plays a key role in traffic safety. In response to the observations that novice drivers are particularly at risk on the roads and often display aggressive behaviour, characterized notably by harsh decelerations, it could be hypothesized that their situation assessment skills are faulty. In other words, novice drivers could fail at assessing situations fast enough to anticipate a behavioural response and apprehend the traffic in a “reactive mode”. To test this hypothesis, novice drivers need to be compared to more experienced drivers on an assessment task, with the main focus on their *reaction time*. The goal of this experiment would be to determine whether novice drivers do lack assessment skills or whether their aggressive driving is explained by a different reason. To investigate this, the reaction process can be broken down into three distinct moments: (1) seeing the dangerous situation, (2) assessing that it needs a reaction and making the decision to behave accordingly and (3) having a behaviour response. In the hypothesis of a lack of assessment skills, and for comparable total reaction times, the duration between moment (1) and moment (2) will be longer in novice drivers than in experienced drivers. If on the contrary, the duration between moments (2) and (3) is longer in novice drivers, the aggressive driving style and lack of anticipation would be imputed to motivation, sensation-seeking traits, or any other reason. Facing a dangerous or stressful situation activates the sympathetic nervous system, resulting in physiological changes such as an increase in cardiac rhythm or pupil dilation. Therefore, such physiological measures could be used to determine the moment when drivers assess or recognize the situation as dangerous, i.e., moment (2) in the model presented above. The experiment suggested to answer the hypothesis would then rely on physiological measurements to compare assessment time in novice drivers and experienced drivers. The physiological indicator currently considered is pupil dilation. The task would be for participants to watch traffic videos from a driver’s point of view that contain situations that require a behavioural response to avoid danger. They would be instructed to press a button to indicate that they would like to either brake or turn the wheel (i.e., have a behavioural response), which would enable experimenters to record the reaction time between moments (1) and (3). When accounting for that total reaction time, it is expected that novice drivers will show a longer duration between moments (1) and (2), hinting at a capability issue rather than a motivation issue. The results of this experiment could help understand cognitive processes in drivers depending on their experience and could be useful to tailor the support we can provide them.