

Evaluating the distractive power of secondary tasks while driving

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Abstract

Distraction is likely to increase the risk of crash during driving as it may elicit periods of divided attention from the main task, e.g. by glancing away from the road scene. Distraction may occur when a secondary task is performed concurrently with driving. However, as many skills are automated, the driver may keep the ability to perform secondary tasks. Besides, some of them are closely associated with driving actions (e.g. opening a window or switching the radio on). The aim of this study is to evaluate the distractive power of several day life tasks that can be performed while driving. The experiment took place on a private circuit on which 39 drivers were asked to drive as usual. At some predetermined times, additional tasks were requested by the experimenter. Drivers had to manage the dual-tasks in a counterbalanced order, considered the distractors: air-conditioning adjustment, mental arithmetic, money preparation for toll highway, CD-programming and response to questions. The extent to which each secondary task was distractive was assessed by recording electrodermal activity (EDA). EDA evolved as early as the dual-task demand increased. Preparation of money for toll highway had the most distractive power, whereas air-conditioning adjustment was the less distractive, the others eliciting intermediate distraction. Whereas managing two tasks simultaneously remains possible, the distractive power of a secondary task is dependent upon its degree of interference with driving. Tasks sharing cognitive and motor demand with driving were the most distractive.

Introduction

Contribution of driver inattention and distraction in crashes is known for many years. Treat (1980) identified inattention and internal distraction as major driver error causal factors. He defined inattention as “a non-compelled diversion of attention from the driving task”, whereas an internal distraction was a “diversion of attention from the driving task that is compelled by an activity or event inside the vehicle”. Inattention is more difficult to monitor, being a special state of the driver involved in his thoughts. Stutts et al (2001) listed several possible sources of driver distraction either due to outside or inside events, a contribution which was completed recently

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