

The Dangers of Attentional Inertia in the Driving Task

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Abstract : The allocation of visual attention is critical when driving and anything that limits attention will have a detrimental impact on safety. Engaging in a secondary task reduces the amount of attention directed to the road because drivers allocate resources towards this task, leaving fewer resources to process driving-relevant information. Yet the dangers associated with a secondary task do not end when the driver returns their attention to the road. Instead, the attentional settings adopted to complete a secondary task may persist to the road, affecting attention, and therefore affecting driver performance. This 'attentional inertia' effect was investigated in the current work. Forty drivers searched for hazards in driving video clips while their eye-movements were recorded. At varying intervals they were instructed to attend to a secondary task displayed on a tablet situated to their left-hand side. The secondary task consisted of three separate computer games that induced horizontal, vertical, and random eye movements. Visual search and hazard detection in the driving clips were compared across the three conditions of the secondary task. Results showed that the layout of information in the secondary task, and therefore the allocation of attention in this task, had an impact on subsequent search in the driving clips. Vertically presented information reduced the wide horizontal spread of search usually associated with accurate driving and had a negative influence on the detection of hazards. The findings show the additional dangers of engaging in a secondary task while driving. The attentional inertia effect has significant implications for semi-autonomous and autonomous vehicles in which drivers have greater opportunity to direct their attention away from the driving task.

Keywords : attention, eye-movements, hazard perception, visual search

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