

Spontaneous speed: theoretical and applied considerations

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Abstract

This research paper suggests a model of driving behaviour that is based on the assumption that driving represents an optimal adaptation to the environment (Anderson, 1991). Optimal adaptation will be defined in terms of minimum mental workload, gained by assigning driving control to automatic processes. A first prediction of the model is that a *spontaneous speed* exists that corresponds to the speed for which the driver workload is set to a minimum, given certain environmental conditions. As automatic processing arises from extensive practice, the model also predicts that experienced drivers show such a spontaneous speed. Consequently, the speed the novice drivers freely choose should not be associated with a minimum workload.

Converging results of three experiments, as well as practical implications of the model, will be discussed.

Introduction

Cognitive science has only recently shown interest towards driving behaviour. Processing levels (see Rothengatter, 1997), visual search behaviours (e.g., Theeuwes, 1989; Theeuwes & Godthelp, 1995), time-to-contact estimation (see Sidaway *et al.*, 1996), and motion perception (e.g., Berthelon and Mestre, 1993), are just a few aspects of the driving behaviour that have been studied in recent years from this perspective.

Driving behaviour as adaptation

Although the literature on driving behaviour is conspicuous, it is worth to note that general principles of driver's cognitive functioning are rather hard to be identified (e.g., Michon, 1985). Nevertheless, those general principles could be used to prevent specific unwanted behaviour, even for those situations not explicitly studied. Road design, traffic regulation, as well as education would benefit of such an approach.

In D. de Waard, K.A. Brookhuis, J. Moraal, and A. Toffetti (2002), *Human Factors in Transportation, Communication, Health, and the Workplace* (pp. 175 - 188). Maastricht, the Netherlands: Shaker.