

Allocating Attention to Detect Motorcycles: The Role of Inattentional Blindness

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Abstract

Objective:

To determine whether inattentional blindness (IB) can be used to understand the psychological mechanisms around looked-but-failed-to-see (LBFTS) crashes involving motorcycles

Background:

IB occurs when an observer looks directly at an object yet fails to see it, thus LBFTS crashes may be a real-world example of IB. The study tests a perceptual cycle model in which motorcycles are detected less frequently because they fall lower on the attentional hierarchy for driving.

Method:

A driving-related IB task with photographs of driving situations investigated whether an additional stimulus, a taxi or motorcycle, would be more likely to be missed by participants. In Experiments 2 and 3, the “threat value” of objects in the scene were varied to determine the degree to which this influences participants’ tendency to notice motorcycles.

Results:

Participants were twice as likely to miss a motorcycle compared with a taxi. Moreover, participants reported that they would expect to miss a motorcycle on the road. In Experiments 2 and 3, participants modulated their attention to accommodate motorcycles when necessary, suggesting that motorcycles are afforded the lowest level of attentional bandwidth.

Conclusion:

Inattentional blindness forms a good psychological framework for understanding LBFTS crashes, particularly in the context of attentional set, such that LBFTS crashes occur because motorcycles do not feature strongly in a typical driver’s attentional set for driving.

Application:

The findings here are important because LBFTS crashes can be reduced if we can change the expectations of road users around the presence of motorcycles on the road.

Keywords attention, perceptual cycle, driving, situation awareness, inattentional blindness