

Judgments of approach speed for motorcycles across different lighting levels and the effect of an improved tri-headlight configuration.

Abstract

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Introduction

The misperception of vehicle approach speed is a key contributory factor to road traffic crash involvement. Past research has indicated that individuals use the rate of visual looming to calculate the time to passage (TTP) of a vehicle, and that smaller vehicles loom to a lesser extent than larger vehicles. Despite a disproportionate number of fatal injuries occurring on the road after dark, and a higher than average number of accidents involving automobile drivers violating the right of way of a motorcyclist occurring in low light conditions, there has been very little consideration of the accuracy of TTP for smaller and larger vehicles under low levels of luminance.

Investigation

We investigated drivers' judgments of motorcycle and car approach speeds across a number of levels of luminance within a virtual city scene, as well as the effectiveness of a tri-headlight formation on motorcycle speed judgments.

Result

The accuracy of car approach speed judgments were not affected by changes in lighting conditions, but speed judgments for the solo headlight motorcycle became significantly less accurate as lighting reduced in the early night and night-time conditions.

Conclusion

Incorporation of a tri-headlight formation onto the standard motorcycle frame resulted in improved accuracy of approach speed judgments, relative to the solo headlight motorcycle, as ambient light levels reduced. The practical implications of the findings are discussed in terms of road safety and motorcycle design.