

# **Motorcycle Accident Risk Could Be Inflated by a Time to Arrival Illusion**

## **Abstract**

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### **Purpose**

Drivers adopt smaller safety margins when pulling out in front of motorcycles compared with cars. This could partly account for why the most common motorcycle/car accident involves a car violating a motorcyclist's right of way. One possible explanation is the size–arrival effect in which smaller objects are perceived to arrive later than larger objects. That is, drivers may estimate the time to arrival of motorcycles to be later than cars because motorcycles are smaller.

### **Methods**

The authors investigated arrival time judgments using a temporal occlusion paradigm. Drivers recruited from the student population ( $n = 28$  and  $n = 33$ ) saw video footage of oncoming vehicles and had to press a response button when they judged that vehicles would reach them.

### **Results**

In experiment 1, the time to arrival of motorcycles was estimated to be significantly later than larger vehicles (a car and a van) for different approach speeds and viewing times. In experiment 2, the authors investigated an alternative explanation to the size–arrival effect: that the smaller size of motorcycles places them below the threshold needed for observers to make an accurate time to arrival judgment using tau. The authors found that the motorcycle/car difference in arrival time estimates was maintained for very short occlusion durations when tau could be estimated for both motorcycles and cars.

### **Conclusions**

Results are consistent with the size–arrival effect and are inconsistent with the tau threshold explanation. Drivers estimate motorcycles will reach them later than cars across a range of conditions. This could have safety implications.