RESEARCH Spotlight

Protecting Vulnerable Road Users: Ensuring the Safety of Bicyclist Infrastructure for an Aging Population

By

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FINDINGS

Main findings include the following: 1) younger and older drivers were inaccurate in their distance estimates when passing cyclists, but overall tended to underestimate distances (e.g., when asked to pass at 3 feet, drivers passed at much greater distances); 2) cognitive measures did not strongly predict distance judgments; and 3) driver behavior inside and outside of the simulator were correlated, validating the use of simulators to understand passing distance. From our results, it can safely be concluded that when motorists do not pass a cyclist with at least three feet of clearance, this is not due to drivers overestimating the distance between their vehicle and a cyclist.

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Background

Bicycling is a popular outdoor activity for people of all ages and is associated with significant health benefits. However, bicycling is also one of the most dangerous modes of travel. When involved in a collision, a bicyclist's risk of injury or death is greater than seven times that of a motorist, and this risk increases with age: cyclists aged 65 and older face a risk three times that of cyclists in general.

Implementing effective traffic countermeasures, such as bicycle lanes and shared lane markings (sharrows), can enhance the safety of both younger and older bicyclists by encouraging cyclists and motorists to behave more predictably, improving cyclist conspicuity, and encouraging motorists to give bicyclists greater leeway when passing. While past work examining the effectiveness of bicycle lanes frequently finds some safety benefits after bicycle lanes are installed, these studies do not consistently find an increase in the distance at which motorists pass bicycles, sometimes finding that motorists pass at closer distances after the installation of bicycle facilities.

Research

We examined the influence of additional factors related to the distance at which motorists pass cyclists. First, we tested whether the presence of a cyclist lane boundary line affected the accuracy of drivers' estimates of passing distance as they passed a stationary cyclist/bicycle. Second, we evaluated whether individual differences in spatial ability and processing speed among drivers predict the accuracy of passing distance estimates. Third, because participants completed parallel simulator and field versions of the passing distance task, we also compared the accuracy of passing distances in a simulated driving task to those observed in a field task for both younger and older adults, as well as examined the correspondence between individual drivers' performance in both types of task.