



DO MOTORCYCLE HELMETS INTERFERE WITH THE VISION AND HEARING OF RIDERS?

Motorcycle crash statistics show that helmets are about 29 percent effective in preventing crash fatalities. That is, on average, riders wearing a helmet have a 29 percent better chance of surviving a crash than riders without a helmet.

Opponents of mandatory state motorcycle helmet laws, however, have suggested that although effective in reducing injuries, helmets may increase a rider's risk of crashing by interfering with the ability to see and hear surrounding traffic.

The National Highway Traffic Safety Administration (NHTSA) sponsored a study to assess the effect of wearing a helmet upon the ability of motorcycle riders (1) to visually detect the presence of vehicles in adjacent lanes before changing lanes, and (2) to detect traffic sounds when operating at normal highway speeds. National Public Services Research Institute conducted the study for NHTSA.

Fifty motorcyclists of various ages and riding experience participated in the study. The riders drove their own motorcycles along a prescribed test route. The route was 5 and a half miles on a four lane divided highway. In the vision test, the riders were asked to change lanes periodically, whenever they heard a signal from a following vehicle. When they heard the signal, riders were instructed to turn their heads to check traffic in the adjacent lane, and then make the lane change in their normal manner. Each rider drove the test route three times; once each while wearing a full coverage helmet, a partial coverage helmet, and no helmet. The degree of head rotation riders made during the lane changes was measured.

To assess the effect of the different helmets upon hearing, the volume of the sound signal used to prompt the lane change was systematically varied. The

minimum sound level (auditory threshold) was recorded for each rider. Half of the riders were in the vision test and half in the hearing test condition.

Vision Results

The vision test showed that most riders recover the lateral field of view that is lost by wearing a helmet by turning their heads a little farther. Before changing lanes, 19 of the 23 riders compensated for the loss by turning their heads more when they were wearing a helmet than when they were not wearing one. These riders did not require significantly more time to turn their heads to check for traffic. Only four riders did not compensate.

Helmet use did not hamper the ability of riders to see traffic or increase the time needed to visually check for nearby traffic. Overall, any negative interference of helmets on rider vision appears to be minor, especially in comparison to the protection offered by helmets should a crash occur.

Hearing Results

The hearing test showed that there were no significant differences in the riders' ability to hear the auditory signals regardless of whether they were wearing a helmet or not. There was a difference, however, in the hearing threshold between travel speeds of 30 and 50 mph. At the greater speed, all riders needed a louder auditory signal because of increased wind noise. For any given speed, helmets neither diminished nor enhanced hearing.

These results indicate that wearing helmets does not restrict the ability to hear auditory signals or the

likelihood of seeing a vehicle in an adjacent lane prior changing lanes. The information in this study will benefit motorcycle safety advocates across the nation seeking information about the impact of helmet usage on motorcyclists' vision and hearing.

HOW TO ORDER

For a copy of *The Effects of Motorcycle Helmets on Seeing and Hearing* (16 pages) write to the Safety Countermeasures Division, NHTSA, NTS-23, 400 Seventh Street, S.W., Washington, DC 20590, or send a fax to (202) 366-7149.

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