

Road safety factsheet:

Headphones as driver distraction

December 2023

Although it has been noted that headphones can cause hearing damage, much less attention has been paid to the effects of headphones on the quality of performance while driving. It is expected that drivers who are wearing headphones would need to shift from what they hear in their headphones to external sound sources in certain situations, which could delay the speed of their response to external events. This is thought to be dangerous enough to form a risk in emergency situations. Some earphones even have noise cancelling technology, meaning drivers are at risk of not hearing sounds vital to driving safely.

It has also been suggested that wearing headphones while driving causes more problems than listening to dashboard mounted equipment such as a radio, because headphones reduce acoustic cues and can divert a driver's attention from information helpful to their ability to drive safely, such as the sirens of an approaching emergency services vehicle.

However, although this factsheet explores research on headphones as a distraction from a driver's perspective, they can also be a distraction to other road users, such as pedestrians and cyclists. All road users, whether drivers, riders or pedestrians need to be able to look and listen for each other when sharing the road. For this reason, RoSPA does not recommend the use of audio equipment that reduces a road user's ability to hear traffic noise.

Research on headphones as a driving distraction

In 2022, there were 2,616 road collisions in Britain in which distraction in the vehicle was deemed a contributory factor. This included 76 fatal collisions and 701 collisions in which someone was seriously injured¹.

Research has indicated that the reduction of vehicle and roadway sounds can lead drivers to underestimate vehicle speed both in the laboratory and on the road, and when driving during the day and at night time².

¹ DfT (2023) 'Table RAS0701: Contributory factors: Collisions, casualties and road user types':

<https://www.gov.uk/government/statistical-data-sets/reported-road-accidents-vehicles-and-casualties-tables-for-great-britain#factors-contributing-to-collisions-and-casualties-ras07>: December 2023

A study by Nelson and Nilsson (1990)² compared the driving performance of 12 drivers who listened to the same music through headphones and through a dashboard speaker. The study was carried out using an automobile simulator in Canada, which incorporated steering accuracy and accelerator speed control. However, the simulator was modified to include a number of tasks cued by sound and vibration such as shifting gears, operating the window controls and turning off and restarting the engine.

Throughout the driving period, the reaction time of respondents to complete these tasks was measured. The speedometer changed its indicated speed 13 times, gears had to be shifted six times and there were five hazards to react to. The drivers took part in one drive using headphones and one drive using the dashboard mounted speaker, with half listening to the headphones first, while the other half listened to the speaker first.

The results of the study suggested that reaction time to tasks tended to improve slightly on average over the session and using the headphones or the speaker made no difference to this. The reaction time to shifting gears was about one third of a second longer while wearing headphones, which was statistically significant. Results also indicated that reaction to hazards was one fifth of a second longer while wearing headphones and that there were eight per cent more steering errors, although this was not statistically significant. There was little to no difference between headphones and speakers in regard to accelerator error or reaction to speed changes.

However, it was noted that this was likely to be because speed change and acceleration rely on visual cues. Headphones appear to primarily reduce audio attention, which is critical when driving as audio cues can be the first warning sign of an unexpected event. At 75km/h (46mph), a difference in reaction time of 0.3 seconds means a difference of six metres in distance travelled, which could be critical in an emergency situation.

The results of the study were also consistent with research suggesting that drivers report less accurate judgements of speed when their hearing is reduced. The fact that speed is underestimated when hearing is reduced takes on a new significance when it is realised that drivers who are wearing headphones might not only respond slower but could also be biased to drive faster.

The law on wearing headphones while driving

In the UK, it is not specifically illegal to drive while wearing headphones, but if the police believe a driver was distracted or not in full control of their vehicle, the driver could be stopped and penalised³. Rule 148 of the Highway Code also states that safe driving and riding needs concentration, and therefore drivers and riders should avoid distractions such as loud music that could mask other sounds.

² Nelson, T. M. And Nilsson, T. H. (1990) 'Comparing Headphone and Speaker Effects on Simulated Driving', *Accident Analysis and Prevention*, 22(6): 523-529.

³ Gov UK (2016) 'Using Mobile Phones When Driving: The Law' URL: <https://www.gov.uk/using-mobile-phones-when-driving-the-law>: Accessed December 2023

However, in some countries, using headphones while driving is illegal. In July 2015, France made it illegal for all drivers, riders and cyclists to 'bring to their ear' any device capable of emitting sound (excluding corrective deafness electronics), such as headphones and Bluetooth headsets for the purpose of making or receiving telephone calls or to listen to music. If drivers or riders choose not to comply with these rules, they could face a €135 fine or a loss of three points on their driving licence, which is equivalent to the penalty faced by those not wearing their seatbelt⁴.

⁴ The Local (2015) 'France bans earphones for drivers and cyclists' URL: <http://www.thelocal.fr/20150618/french-drivers-banned-from-using-earphones>: Accessed December 2023