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Self-reported speed compliance and attitudes towards speeding in a representative sample of drivers in Australia

A.N. Stephens[a,*], M. Nieuwesteeg[b], J. Page-Smith[b], M. Fitzharris[a]

[a] Monash University Accident Research Centre, Monash University, Clayton, Victoria, Australia
[b] Transport Accident Commission, Victoria, Australia

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ABSTRACT

Background: Vehicle speed is a major contributor to road trauma, both in terms of increased crash risk and injury severity. In Australia, approximately one third of fatal crashes occur in speed zones of 100 km/h. This proportion has remained the same, despite the reduction in the number of road fatalities over the past decade. To drive further reductions in speed-related crashes, an improved understanding of the underlying determinants of speed choice is required.

Method: A community attitude survey designed to understand speed behaviour and attitudes towards speeding was distributed to a large (N = 5179) representative sample of drivers in Australia. Participants provided information regarding their normal speed choices across four different speed zones (40, 50, 60 and 100 km/h), beliefs about the risks and enforcement of speeding behaviour as well as technology to reduce speeding.

Results: Almost half of the sample (47%) reported exceeding the speed limit in 100 km/h zones, although only a small number of these drivers (< 0.5%) did so by 11 km/h or more. Age and sex were related to speed limit non-compliance. Males were more likely to be classified as mid-level speeders, defined as being up to 10 km/h over the limit, and excessive speeders (11 + km/h over the limit). Younger drivers were also more likely to be non-compliant. When compared to compliant drivers, non-compliers perceived less risk of a serious crash, reported greater likelihood of exceeding the speed limit when they believed they would not be detected, and reported a higher level of social acceptability of speeding. Only one-third of the sample reported prior knowledge of intelligent speed assist (ISA) technology, however, once explained, the majority agreed it would be personally useful (64%). Speed non-compliers were somewhat less likely to support the usefulness of ISA than speed limit compliant drivers.

Conclusion: These findings can be used to target appropriate interventions and road safety messages, aimed at reducing speeding behaviour. Measures designed to address perceived social acceptability of speed behaviour, the increased crash risk associated with speeding, and the threat of detection are recommended.

1. Background

Vehicle speed is acknowledged as a major contributor to serious injury and fatality crashes. Further, researchers have shown that even small exceedances of speed in relatively slow speed zones can increase the risk of crash involvement. Kloeden et al. (2002) analysed case-control data from drivers in Adelaide, Australia, and reported that in a 60 km/h zone, the relative risk of crash involvement doubles for every additional 5 km/h over the limit. These researchers estimated that the elimination of all speed violations in 60 km/h zones would reduce the number of serious crashes by approximately 25%, with 60% of this associated with the elimination of low level speeding (defined as up to 15 km/h over the speed limit). Likewise, Elvik (2008) proposed that in similar speed zones (60–80 km/h) the number of serious and fatal crashes could be reduced by approximately 22% with the elimination of speeding. Therefore, encouraging drivers to comply with the posted speed limit is critical to the reduction of speed-related serious injury crashes, and this holds true for all, not just extreme, deviations from the speed limit.

It has previously been reported that the majority of drivers who speed do so at low levels. In a comprehensive observational study of speed behaviour in Victoria, 9.5% of drivers drove above the speed limit (Alavi et al., 2014), and in 95% of these cases vehicle speeds were less than 10 km/h over the posted limit. Importantly, Alavi et al. (2014) suggested that this type of low level speeding accounts for 79% of all reported Victorian speeding-related serious crashes, with excessive

* corresponding author.
E-mail address: Amanda.stephens@monash.edu (A.N. Stephens).

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speeding (> 10 km/h over posted limit) estimated to account for less than 5% of the reported speed-related crashes (Alavi et al., 2014). It follows then that the large contribution of low-level speeding to speed-related crashes is likely to be due to this behaviour being relatively common. It is therefore important to understand whether this is indeed the case, and if so, what attitudes drive this behaviour and whether these differ from attitudes towards high level speeding.

A number of survey studies have shown that speeding is often a conscious decision, underpinned by perceptions regarding crash-risk and level of enforcement. For example, drivers who speed more frequently (at least 50% of the time) are less likely to perceive speeding as a behaviour that contributes to crashes or crash risk, and are more likely to hold negative views regarding enforcement (Mackay et al., 2013). Fildes et al. (1991) interviewed drivers observed to be driving over the speed limit and found that, in comparison to slower drivers, drivers who sped excessively tended to consider faster speeds as less dangerous. These results suggest that risk perceptions underlie both the frequency and severity of speeding. However, perceptions regarding enforcement also appear related to speed choices. Fleiter and Watson (2006) found that the degree to which drivers exceed the speed limit differed across speed zones of 60 and 100 km/h. In their study, drivers were less likely to exceed the speed limit in 60 km/h zones (34%) when compared to 100 km/h (58%) zones, and the magnitude of non-compliance was notably higher in the 100 km/h zone. Drivers in this study also reported, on average, a perceived enforcement tolerance of around 10% for both speed zones, which may explain in part why more severe speed exceedances were reported for the faster zone. Therefore, while speeding may represent a driving style for some drivers, speed choices also appear to be part of a dynamic assessment of the traffic environment, of which the current speed limit, perceptions of risk, and likelihood of enforcement play a significant role.

There is broad agreement on the characteristics of drivers likely to exceed the speed limit. In particular, young drivers (Fildes et al., 1991) and males (Shinar et al., 2001) have been identified as more likely to drive above the speed limit. Moving towards a more nuanced understanding of speed behaviour, Watson and colleagues (Watson et al., 2015) argued that drivers ought to be classified according to the magnitude and frequency of their speeding when profiling drivers who exceed the speed limit. In their large study of 84,456 speeding offences, Watson et al. found that males were significantly more likely to be repeat-high-range offenders (having received two or more speed-related fines for travel speeds 30 or more km/h) and represented only a small proportion of those classified as once-only low-range offenders (one speeding fine and for low level speeding). More specifically, 90% of repeat high-range offenders were male and 41% aged between 17 and 24 years old. In contrast, 51% of once only offenders were male and 9.4% aged between 17 and 24 years; this highlights the diversity of age and gender found within the speed behaviour classifications. Therefore, low-level speeders appear to have a different age and sex profile than higher level speeders, and identifying what these are is of value when designing targeted road safety strategies related to speed enforcement programs and road safety awareness campaigns.

Moving beyond traditional speed enforcement and educational programs, technology solutions such as Intelligent Speed Assist (ISA) will likely play an increasingly important role in mitigating speed behaviour. ISA reduces the incidences of speeding behaviour by alerting the driver when they are travelling at a set speed above the posted speed limit. ISA has been found to be effective in reducing speed non-compliance in car drivers (Brookhuis and de Waard, 1999; Regan et al., 2006; Warner and Åberg, 2008) and in truck drivers (Fitzharris et al., 2011). However, non-compliance increases again after ISA is inactivated (Regan et al., 2006). While ISA appears to be a promising countermeasure and one that is positively accepted by drivers for whom it is fitted (Regan et al., 2006; Warner and Åberg, 2008) little is known about the general attitudes of drivers in this regard. In particular, the relationships between speed non-compliance and attitudes towards ISA technology. Given that exceeding the posted speed limit is a persistent road safety problem, it is important to gain an understanding of attitudes towards technology to improve road safety across a range of drivers.

The aims of the study were twofold. First, to understand the prevalence of self-reported speed non-compliance in a representative sample of drivers in Australia. Further, to explore attitudes towards speeding behaviour as well as intelligent speed assist (ISA) technology to reduce speed-related non-compliance.

2. Method

2.1. Procedure

A stratified sampling procedure was used to obtain a sample of drivers in Australia with a representative age and sex distribution across the States and Territories (Victoria, New South Wales, Queensland, Western Australia, Tasmania, the Australian Capital Territory and the Northern Territory). Data were collected via a Community Engagement and Social Acceptability survey which was developed by the Transport Accident Commission (TAC) Victoria in collaboration with Monash University Accident Research Centre. The survey was administered by Ipsos Social Research Institute and recruitment was through a panel of members who completed the survey online at their own convenience.

2.2. Participants

A total of 5656 responses were received. A final sample of 5179 licensed drivers (males = 45%) was retained after data were cleaned to remove incomplete datasets (112 cases) and those who reported not holding a licence permitting them to drive a motor-vehicle (365 cases; see Fig. 1). Participants ranged in age from 16 to 75 years (M = 44.58, ± 16.75) and were grouped into five age groups: 16–21 years, 22–25 years, 26–39 years, 40–59 years, 60–75 years. Fig. 1 shows the sex distributions across each age group. Almost 40% of the sample were aged between 26–39 years, and a further 40% were aged between 40–75 years. Sex was evenly distributed across these groups, however a larger percentage of drivers aged 16–25 were females. Although these age and sex distributions are broadly similar to recent census data published by the Australian Bureau of Statistics (ABS, 2014), all analyses were weighted in respect of the stratified sampling design.

2.3. Materials

The TAC Community Engagement and Social Acceptability Survey is a large survey designed to assess a range of self-reported driving behaviours and attitudes towards road safety and interventions to improve road safety. The survey was administered in two Phases, however only data from Phase 1 are presented in this paper. Phase 1 contained 57 questions in total and the presentation of the items was counterbalanced across participants. Demographic information (age, sex, postcode, annual mileage and licence type) was sought as well as questions specific to the current paper, which included:

2.3.1. Self-reported compliance with posted speed limits

Participants were asked to report what speed they normally drive at across four speed zones of 40 km/h; 50 km/h; 60 km/h and 100 km/h. Responses were given using a five-point Likert-type scale (1 = below or at the speed limit; 2 = Up to 5 km/h over the speed limit; 3 = between 6 and 10 km/h over the speed limit; 4 = between 11 and 15 km/h over the speed limit; 5 = more than 16 km/h over the speed limit).

2.3.2. Attitudes towards own speeding behaviour

Three questions elicited information on motivations for speed behaviour: i) *"I drive over the speed limit if I'm sure I can get away with*