

## Exploring perceived legitimacy of traffic law enforcement

Watling, C.N.<sup>1</sup> & Leal, N.L.<sup>1</sup>

<sup>1</sup> Centre for Accident Research & Road Safety – Queensland (CARRS-Q)

### Abstract

The purpose of traffic law enforcement is to encourage compliant driver behaviour. That is, the threat of an undesirable sanction encourages drivers to comply with traffic laws. However, not all traffic law violations are considered equal. For example, while drink driving is generally seen as socially unacceptable, behaviours such as speeding are arguably less so, and speed enforcement is often portrayed in the popular media as a means of “revenue raising”. The perceived legitimacy of traffic law enforcement has received limited research attention to date. Perceived legitimacy of traffic law enforcement may influence (or be influenced by) attitudes toward illegal driving behaviours, and both of these factors are likely to influence on-road driving behaviour. This study aimed to explore attitudes toward a number of illegal driving behaviours and traffic law enforcement approaches that typically target these behaviours using self-reported data from a large sample of drivers. The results of this research can be used to inform further research in this area, as well as the content of public education and advertising campaigns designed to influence attitudes toward illegal driving behaviours and perceived legitimacy of traffic law enforcement.

### Keywords

Perceived legitimacy; law enforcement; attitudes; driver behaviour.

### Introduction

Considerable gains have been made in road safety in Australia in recent decades, with road deaths (and rates of road deaths per head of population) showing a steady decline (Australian Transport Council, 2011). However, a group of behaviours generally referred to as the ‘fatal four’ continue to be a factor in serious casualty (i.e., fatal and hospitalisation) crashes. These behaviours are typically targeted in police road safety campaigns, such as the 2010 Christmas Road Safety Campaign in Queensland, where Queensland Police Service unveiled four vehicles featuring gravestones marked with the fatal four to raise motorist awareness about the risks of these behaviours (Queensland Police Service, 2010).

Of the 269 fatalities that occurred on Queensland roads in 2011, 20.4%<sup>1</sup> occurred in a crash where at least one controller was drink driving, 17.8% occurred in a crash where at least one controller was speeding, 15.2% occurred in a crash where fatigue was deemed to be a factor, and 29.5%<sup>2</sup> were unrestrained (Transport and Main Roads, 2012). Traffic authorities have dedicated considerable effort to increasing driver awareness of the risks associated with speeding, drink driving, driving while fatigued, and failing to wear a seatbelt. However, these efforts have been more successful in changing some attitudes and behaviours than others.

For instance, speeding, drink driving and fatigued driving are three of the top four factors

---

<sup>1</sup> A number of factors can be found to contribute to a crash. For example, a fatally injured person may have been involved in a crash where at least one person was speeding, drink driving, fatigued and/or unrestrained. Thus these percentages are not mutually exclusive.

<sup>2</sup> Denominator for percentage includes only cases where restraints were known to be fitted in the vehicle, and restraint use was known.

listed as contributing to road crashes by Australian motorists (Pennay, 2008). However, there appears to be a gap between the 'acknowledged' perception of dangerous behaviours and the actual behaviours of drivers. For example, speeding remains by far the most common traffic infringement (Elvik & Vaa, 2004), with most drivers ignoring posted speed limits with impunity (Harris, Jolly, & Runge, 1999). Moreover, many individuals view speeding fines as mainly intended to raise revenue – even though it is viewed as a serious road safety issue by road safety professionals (Pennay, 2008; Poulter & McKenna, 2007).

Similarly, a remarkable proportion of individuals report driving when they are feeling fatigued (57%) (Vanlaar, Simpson, Mayhew, & Robertson, 2008), with a large proportion of drivers (73%) stating that they would continue to drive even when aware of their increasing levels of fatigue (Nordbakke & Sagberg, 2007). Although fatigued driving is rated as an important factor in vehicle crashes overall (e.g., Pennay, 2008), there is emerging evidence that the dangerousness of driver fatigue is still largely underappreciated by drivers (Fletcher, McCulloch, Baulk, & Dawson, 2005; Jones, Rajaratnam, Dorrian, & Dawson, 2010).

While a potential disparity exists between the perceptions of risk and actual behaviour for speeding and fatigued driving, other acknowledged dangerous behaviours such as drink driving and driving without a seatbelt have more aligned perceptions of risk and behaviours. However, this has not always been the case. The success of traffic authorities in aligning these perceptions and behaviours is most likely due to the combined effects of a number of factors and campaigns that have raised public awareness and increased social disapproval of these behaviours over time, complemented by police enforcement practices (Homel, 1988).

Traffic enforcement activities represent a substantial proportion of police resources. The purpose of traffic law enforcement is to encourage road users to comply with established traffic law, and it is traditionally underpinned by deterrence theory principles. Deterrence theory proposes that the perceived consequences of being apprehended while engaging in a illegal behaviour will dissuade the illegal behaviour (Homel, 1988). Classical deterrence theory is predicated on three factors: the certainty, severity, and swiftness of punishment. When the certainty of punishment is high, the punishment is severe, and dispensation of punishment is swift, individuals are likely to be deterred (Homel, 1988; Taxman & Piquero, 1998). Deterrence theory has been successfully applied to investigations of illegal traffic behaviours and the development and implementation of road safety countermeasures, such as random breath testing for drink driving.

The ability of traffic authorities and police services to manipulate deterrence theory variables to compel individuals to adhere to traffic laws is limited by practical constraints. Generally, the likelihood of being apprehended by police when committing a traffic offence is quite low compared to the number of times an individual engages in the behaviour (Adams, 1985). Increasing the likelihood of detection by increasing police enforcement is limited by financial constraints. However, special operations or "blitzes" involving highly publicised and highly visible enforcement may have a temporary effect of increasing *perceived* likelihood of detection (Homel, 1988). If certainty of detection is low, certainty of punishment will be similarly low. However, mandatory penalties can ensure that certainty of punishment exists for detected offenders. Issues of low certainty of detection and therefore low certainty of punishment are particularly problematic for behaviours that are more difficult for police to detect, as is indeed the case for fatigued driving, compared to speeding and drink driving where objective measures (speed readings, blood/breath alcohol concentrations) can be obtained and used to determine the appropriate offence category and sanction.

The severity of punishment is a factor that is within the control of traffic authorities. Research has shown that it is important that the severity of a penalty is consistent with the severity of the offence, and that it be substantial for it to influence illegal behaviour (SWOV, 2011). However, there is evidence from a number of road safety studies that perceived severity of penalties is not as important as other deterrence variables, as some studies have found no relationship (Watling, Palk, Freeman, & Davey, 2010; Watson, 2004), or a positive relationship (Fleiter, Watson, Lennon, King, & Shi, 2009; Gee Kee, Steinhardt, & Palk, 2007) between perceived severity of penalties and behaviour. It has been argued that increasing the severity of penalties is unlikely to influence behaviour unless such an approach is accompanied by increased perceptions of likelihood of detection and certainty of punishment (Homel, 1988; Nichols & Ross, 1990).

Swiftens of punishment can be enhanced with the use of administrative penalties rather than court processes. Also, intercepting drivers to issue infringement notices on the spot rather than notices sent in the post (e.g., in the case of camera detected offences) will enhance swiftens of punishment and better link the punishment received to the behaviour. However, as noted above in the discussion of certainty of detection, these enforcement strategies impose significant resource implications on police services. Another limiting factor for deterrence is the necessity to keep reinforcing the deterrence effectiveness over time due to its temporary effects (Dula, Dwyer, & LeVerne, 2007; Homel, 1986). These shortcomings of deterrence have led to other paradigms to be considered to explain illegal behaviours, including social learning theory (Akers, 1990), perceived legitimacy of laws and associated enforcement (McKenna, 2007b) and defiance (Sherman, 1993).

It was discussed earlier in this paper that attitudes toward drink driving, speeding, driving while fatigued and driving without a seatbelt appear to differ. If people's perceptions of the different behaviours differ, it follows that the perceived fairness of traffic law enforcement activities targeting these behaviours may also differ. In addition, if the behaviour and its enforcement method are perceived as legitimate, then it could be expected that compliance is more likely (McKenna, 2007b). That is, an individual who does not think speeding represents a significant crash risk may not think it is legitimate for police to enforce speeding laws and issue harsh penalties for speeding. They may also be unlikely to comply with speed limits voluntarily. Complementing research exploring attitudes toward illegal driving behaviours and their influence on behaviour with research examining perceptions of enforcement strategies designed to target these behaviours may enhance our understanding of the factors that influence compliance with traffic laws. This is a salient issue for road safety compliance, especially when the likelihood of apprehension may be low and certain penalties may not be perceived as severe. Enhancing our understanding of the factors that influence willingness to comply with traffic laws can facilitate the identification of appropriate targets for intervention.

As such, the current study sought to examine the relationships between self-reported likelihood of behaviour, perceived legitimacy of traffic law enforcement, and attitudes toward drink driving, speeding, fatigued driving, and driving without a seatbelt in a sample of Queensland drivers. Comparisons between the four behaviours on these variables were also of interest. Given that there is scant evidence that has examined these four illegal driving behaviours together in the same study, or perceived legitimacy of traffic law enforcement, four research questions were proposed, rather than hypotheses:

- RQ1. Does self-reported likelihood of engaging in drink driving, speeding, driving while fatigued, and driving without a seatbelt differ between behaviours?
- RQ2. Does perceived legitimacy of enforcement of drink driving, speeding, driving while fatigued, and seatbelt laws differ between behaviours?

- RQ3. Do attitudes toward drink driving, speeding, driving while fatigued, and driving without a seatbelt differ between behaviours?
- RQ4. What are the associations between self-reported likelihood of engaging in illegal behaviour, perceived legitimacy of enforcement and attitudes toward drink driving, speeding, fatigued driving, and driving without a seatbelt?

## Method

### *Participants*

To be eligible for participation in this study, individuals were required to currently drive on Queensland roads, and have held an Open driver's licence<sup>3</sup>. Potential participants were invited via Queensland University of Technology email distribution lists, social networking sites and a research participation link on the website of the Centre for Accident Research and Road Safety – Queensland to complete an online survey which took approximately 10 – 15 minutes. Participants were offered the chance to enter a random draw for one of six \$50 petrol vouchers as a small thank you gift for participating<sup>4</sup>. A total of 312 responses were received before the survey link was closed. It was not possible to estimate the number of people aware of the survey and therefore a response rate.

### *Variables and measures*

The four illegal behaviours of interest in this study were drink driving, speeding, driving while fatigued and driving without a seatbelt. The dependent variables were likelihood of engaging in these behaviours in the next month, while the predictor variables were attitudes toward each behaviour, and the perceived legitimacy of traffic law enforcement activities designed to target them.

The dependent variables, likelihood of engaging in the illegal behaviours, were measured using items where participants reported the likelihood of engaging in drink driving (described as “drive when you think you may be over your legal alcohol limit”), speeding (described as “drive over the posted speed limit”), driving while fatigued (described as “drive when you are feeling fatigued/sleepy”) and driving without a seatbelt in the next month on a 5-point Likert scale scored from 1 (extremely unlikely) to 5 (extremely likely). There were a number of items for each behaviour to assess the likelihood in a variety of circumstances, based on a review of the relevant literature. These items were averaged to form four scale scores, one for each of the investigated driving behaviours. Higher scores indicate higher likelihood of engaging in the behaviour in the next month. For drink driving, the circumstances were when driving alone, when driving with passengers, and when driving in the late night/early morning hours. For speeding, the circumstances were when driving alone, when driving with passengers, driving when there is little other traffic, and when driving on highways. For driving while fatigued, the circumstances were when driving alone, and when driving with passengers. For seatbelt use, the circumstances were when driving alone, when driving with passengers, when driving only a short distance, and when driving in the late night/early morning hours.

---

<sup>3</sup> This criterion was used to ensure participants had a minimum of three years unsupervised driving experience, even if their licence status had changed as a result of a licence sanction. An Open driver's licence is generally unrestricted in Queensland. There were more than 3,000,000 licences on record in Queensland during data collection.

<sup>4</sup> Draw entry involved entering an email address at the end of the survey. Draw entries were stored in a separate database to survey responses to ensure responses could not be linked to individuals.

The independent variable perceived legitimacy of traffic law enforcement practices was measured using a series of items asking participants to indicate their agreement with statements on a 5-point Likert scale scored from 1 (strongly disagree) to 5 (strongly agree). The items were developed using similar wording to that used by Poulter and McKenna (2007), and item scores were averaged to form scale scores for each behaviour. Higher scores indicated greater perceived legitimacy of enforcement approaches. For drink driving, the items asked participants to consider the fairness of random breath testing, targeting drivers who appear to be driving erratically, and breath testing all crash-involved drivers. For speeding, they considered marked fixed speed cameras, mobile radars, hidden speed cameras and devices, and speed enforcement anywhere on the road network. For driving while fatigued, participants considered the fairness of charging crash-involved drivers found to be fatigued, and issuing dangerous driving offences due to fatigue. For seatbelt use, participants responded to items about randomly stopping motorists to check seatbelt use, checking seatbelt use when stopping drivers for other reasons (e.g., at RBT sites), and charging crash-involved drivers who were not wearing a seatbelt. For all behaviours, perceived legitimacy scales included an item stating that police should spend more time and resources on that issue.

The independent variable of attitudes toward the behaviours of interest in this research was measured using a series of items asking participants to indicate their agreement with statements on a 5-point Likert scale scored from 1 (strongly disagree) to 5 (strongly agree). The items were developed based on the definitions component of Akers' social learning theory (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979). For each behaviour, there were two positive, two neutral and two negative statements. Consistent with guidelines presented by Akers for the development of items based on this theory, positive and neutral definitions indicate an acceptance of the illegal driving behaviour (Akers, et al., 1979). Thus scale scores were calculated for each behaviour by reverse scoring the negatively worded items and averaging item scores, so that higher scores indicated more positive attitudes toward the behaviour. The positive statements were that people who engage in the behaviour are generally better drivers, and generally more careful on the road. The neutral items were that engaging in the behaviour was okay as long as you don't do it too much, and as long as no one gets hurt. The negative items were that harsher penalties are needed for the behaviour, and that there is no excuse for engaging in the behaviour.

### ***Procedure***

After obtaining ethics and health safety approval from the Queensland University of Technology, invitations to participate were distributed online. The link to the online survey remained active for approximately one month. It was not possible to complete the survey more than once using the same Internet Protocol (IP) address. Responses were downloaded from the online survey tool into Excel spreadsheets, which were then imported into SPSS for analysis. The data was cleaned and assumptions of statistical tests checked before the final analysis procedure was confirmed and executed to address the study research questions.

## **Results**

### ***Data cleaning and screening***

Of the 312 people who responded to the survey, one person did not proceed beyond the consent page, and 18 did not meet the selection criteria (three people did not drive in Queensland and 15 had never held an Open driver's licence). Thus, valid responses were received from 293 participants. There was only a small amount of missing data scattered throughout the data set, with no variable exceeding more than 5%. A Missing Values Analysis

was conducted using Little's Missing Completely At Random (MCAR) test. It was not significant  $\chi^2(582) = 525.41, p = .95$ , indicating that the missing data was distributed randomly. Rather than deleting participants with any missing data from the study and reduce statistical power, listwise deletion was used to deal with missing data on an analysis by analysis basis. This meant that only participants with missing scores on one or more of the variables under analysis were excluded from an individual test (but could be included in other tests where they did have complete data). Sample sizes for analyses therefore varied slightly.

The data was examined for its distributional properties with departures from normality occurring, and some heterogeneity of within groups variance, which is common with illegal behaviour data. Thus non-parametric tests were used to address the study research questions. Research questions 1, 2 and 3 were addressed using Friedman's test, with significant tests to be followed up with a series of Wilcoxon signed-rank tests to identify the significant pairwise comparisons using an adjusted alpha level of  $p < .0083$ . Research question 4 was addressed by calculating Spearman's Rho correlation coefficients.

### *Analyses*

The average age of the participants was 39.06 years ( $SD = 14.96$ ; range = 20-84 years) with the majority of the sample being female (58.7%). Approximately half of the sample (58.7%) were university educated (undergraduate 31.4%, postgraduate 27.3). The majority of the sample (86.4%) was employed (full-time 57.7%, part-time 10.2%, casual 8.9%, self-employed 9.6%) with the remaining sample being unemployed (4.4%) or students (9.2%). On average, the sample reported having been licensed for 19.68 years ( $SD = 14.70$ ). The majority of the sample drove between 1-10 hours per week (61.1%), followed by 33.1% of the sample that drove 10-20 hours per week (33.1%) and 5.8% that drove more than 20 hours per week.

The means, standard deviations, and Cronbach's alphas for likelihood of behaviour, perceived legitimacy of traffic law enforcement and attitudes scale scores for each behaviour can be found in Table 1. All variables had a range of 1-5 with higher scores indicating greater likelihood, greater perceived legitimacy and more positive attitudes respectively. The internal consistency of all scales was adequate (Cronbach's alpha  $> .70$ ).

**Table 1:** Means, Standard Deviations, and Cronbach's Alphas for study scale scores

<b>Item</b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b><math>\alpha</math></b>	<b>No of items</b>
<i>Likelihood of behaviour</i>				
Drink driving	1.30	0.62	.71	3
Speeding	2.94	1.33	.95	4
Fatigued driving	2.54	1.15	.85 <sup>a</sup>	2
Driving without a seatbelt	1.06	0.40	.92	4
<i>Perceived legitimacy</i>				
Drink driving	4.50	0.52	.72	4
Speeding	3.66	0.98	.91	7
Fatigued driving	3.52	0.87	.77	3
Driving without a seatbelt	3.89	0.85	.81	4
<i>Attitudes</i>				
Drink driving	1.51	0.57	.75	6
Speeding	2.29	0.96	.89	6
Fatigued driving	2.10	0.69	.81	6
Driving without a seatbelt	1.79	0.67	.82	6

<sup>a</sup> Pearson's correlation coefficient

Examination of the likelihood of behaviour means suggested that on the whole, the sample was not likely to drive without a seatbelt or drink drive; with both items exhibiting small standard deviations. The fatigued driving mean was slightly below the mid-point, indicating that participants in general considered it unlikely they would engage in fatigued driving in the next month. The mean for the speeding item was virtually on the mid-point of the 5-point Likert scale, with a large standard deviation; suggesting that likelihood of speeding varied within the sample, which included both likely and unlikely speeders. For research question 1, Friedman's test found that there were significant differences in likelihood of engaging in the behaviours of interest in this study in the next month,  $\chi^2(3) = 480.86, p < .001$ . All post hoc pairwise comparisons (Wilcoxon signed-rank tests) were significant at  $p < .0083$ .

Scores for perceived legitimacy of law enforcement efforts targeting the four behaviours suggested that, on average, the sample believed it was fair to enforce these laws. The highest level of agreement was found for the enforcement of drink driving laws, followed by seatbelt use. Enforcement of speeding and fatigued driving were reported to be the least fair and were quite similar in magnitude. For research question 2, Friedman's test found perceived legitimacy of traffic law enforcement practices varied significantly by behaviour,  $\chi^2(3) = 281.02, p < .001$ , with significant Wilcoxon signed-rank tests at  $p < .0083$  for all pairwise comparisons except fatigue versus speeding ( $p = .028$ ).

On average, the sample reported unfavourable attitudes toward all of the behaviours, and variability was small. The least favourable attitude was for drink driving which was followed by driving without a seatbelt, fatigued driving, and speeding. Of note was that the standard deviation for attitudes toward speeding was larger than that for the other behaviours, and it encompassed the mid-point, indicating that some participants had favourable attitudes toward speeding. For research question 3, Friedman's test found that attitudes toward the behaviours differed significantly,  $\chi^2(3) = 363.55, p < .001$ . All pairwise comparisons were significant at  $p < .0083$ .

Table 2 shows the bivariate correlations between the study variables for each of the driving behaviours of interest, calculated to address research question 4.

**Table 2:** Bivariate correlation matrix (Spearman's rho)

Variable	1	2	3
<i>Drink Driving</i>			
1. Likelihood of drink driving	~		
2. Perceived legitimacy of drink driving law enforcement	-.15*	~	
3. Attitudes toward drink driving	.34**	-.44**	~
<i>Speeding</i>			
1. Likelihood of speeding	~		
2. Perceived legitimacy of speed law enforcement	-.41**	~	
3. Attitudes toward speeding	.65**	-.69**	~
<i>Driving while fatigued</i>			
1. Likelihood of driving while fatigued	~		
2. Perceived legitimacy of fatigue law enforcement	-.23**	~	
3. Attitudes toward fatigued driving	.41**	-.48**	~
<i>Driving without a seatbelt</i>			
1. Likelihood of driving without a seatbelt	~		
2. Perceived legitimacy of seatbelt law enforcement	-.08	~	
3. Attitudes toward driving without a seatbelt	.09	-.55**	~

\*  $p < .05$ ; \*\*  $p < .001$

Perceived legitimacy of law enforcement was significantly associated with likelihood of engaging in drink driving, speeding and driving while fatigued, with lower perceived legitimacy associated with greater likelihood of engaging in the behaviour in the next month. The strength of the relationships varied from small to moderate, with the strongest relationship found for speeding, followed by driving while fatigued and then drink driving. Perceived legitimacy of enforcing seatbelt laws was not significantly associated with likelihood of driving without wearing a seatbelt in the next month, although this may be an artefact of the small variability in likelihood scores, with the majority of the sample (97.9%) reporting it was likely they would wear a seatbelt.

A similar pattern of results emerged for the relationships between attitudes and likelihood scores, with positive attitudes associated with greater likelihood of engaging in drink driving, speeding and driving while fatigued in the next month. Again, the strength of the relationships were moderate, with the strongest relationship observed for speeding, followed by driving while fatigued and then drink driving. Attitudes toward seatbelt use were not significantly associated with likelihood of driving without wearing a seatbelt in the next month.

The relationships between perceived legitimacy of law enforcement and attitudes scores were all significantly correlated for all behaviours with moderate to large correlations; more positive attitudes towards the illegal behaviours were associated with lower perceived legitimacy of enforcement targeting these behaviours.

## **Discussion**

The purpose of the current study was to examine the relationships between self-reported likelihood of behaviour, perceived legitimacy of traffic law enforcement, and attitudes toward drink driving, speeding, fatigued driving, and driving without a seatbelt. Comparisons between the four behaviours on these variables were also of interest. Each year, the amount of road fatalities and serious injuries that are attributed to one of these illegal driving behaviours are substantial. Thus, examining factors associated with compliance with traffic regulations which may inform interventions designed to reduce these behaviours and associated crashes has important implications for road safety.

Examination of research question 1 found that the self-reported likelihood of engaging in drink driving, speeding, driving while fatigued, and driving without a seatbelt were significantly different. Overall, driving without a seatbelt was the least likely behaviour reported, followed by drink driving, driving while fatigued, and finally, speeding. This pattern of likelihood is somewhat similar to other studies that have examined behavioural intentions of Australian motorists (Fernandes, Hatfield, & Job, 2010; Pennay, 2008). However, the relatively small proportion of the sample reporting they were likely to engage in these behaviours suggests that the current sample did not appear to be a particularly high-risk driving cohort. It was noted in the presentation of results that there were particularly low levels of variability for likelihood of driving without seatbelt, which may have impacted our ability to detect significant relationships with study variables. However, the two behaviours of driving while fatigued and speeding showed higher levels of variability in addition to greater self-reported likelihood of engaging in these behaviours in the next month. Therefore, while continued education campaigns and enforcement of all high-risk driving behaviours is encouraged, perhaps greater emphasis is warranted for driver fatigue and speeding.

It is important to note that there are differences in the extent to which self-reported likelihood, or even behavioural intentions, are relevant to the four behaviours of interest in this study. For



example, intentions may be more relevant for the more deliberate behaviours such as drink driving and driving without a seatbelt, versus speeding and driving while fatigued, which can occur unintentionally. This issue should be explored in more detail in future research, perhaps drawing from other paradigms such as Theory of Planned Behaviour (Ajzen, 1991) that include a measure of perceived behavioural control.

The perceived legitimacy of enforcement of traffic behaviours is an important aspect of road safety which has received limited attention previously. Examination of research question 2 found that there were also differences in participants' perceptions of the legitimacy of traffic law enforcement approaches for the four behaviours of interest in this study. Consistent with the low self-reported likelihood scores for drink driving and driving without a seatbelt, these two behaviours were found to be the most fair of the illegal driving behaviours to be enforced, respectively. However, the perceived legitimacy of drink driving law enforcement was significantly higher than that for seatbelt use. This is possibly due to the negative image that drink driving holds (Loxley, Saunders, Blaze-Temple, & Binns, 1990) as well as social sanctions for this behaviour (Homel, 1988; Sweedler et al., 2004). It is interesting to note that in Australia, a societal attitudinal change has occurred with respect to the acceptability of drink driving (Homel, 1990). This change is likely to influence the perceived legitimacy of enforcing drink driving, as a moderate and positive correlation was found between attitudes and the perceived legitimacy of enforcement of drink driving in the current study.

Speed and driver fatigue enforcement were perceived as the least legitimate, with these two legitimacy scores not differing significantly. These two factors commonly contribute to serious crashes, however it is often reported in the media that speed cameras are perceived as 'revenue raisers' (Pennay, 2008). Given that some drivers speed frequently but crashes are infrequent events, this may reduce the perceived risk of speeding and lead to the perception that attempts to detect and punish this behaviour are less legitimate than those targeting other behaviours, such as drink driving. However, consistent with the likelihood of behaviour mean scores, which suggested that the sample was generally compliant, the mean perceived legitimacy scores were all above the mid-point on the scale, such that enforcement of the laws designed to target the illegal behaviours of interest in this study were perceived as legitimate.

Examination of research question 3 found that attitudes toward the four behaviours were also significantly different from each other. Consistent with the pattern of results for likelihood of behaviour and perceived legitimacy of enforcement scales, participants reported the most positive attitudes toward speeding, which were significantly more positive than attitudes toward driving while fatigued, which were in turn significantly more positive than attitudes toward driving without a seatbelt. The least positive attitudes were toward drink driving.

Research question 4 was concerned with the associations between study variables. For drink driving, speeding, and driving while fatigued, significant correlations between likelihood of behaviour, perceived legitimacy of enforcement, and attitudes were detected. All but one of these correlations was moderate in magnitude. The only significant correlation among the seatbelt variables was for the relationship between perceived legitimacy and attitudes. It was noted in the results section that the small variability in seatbelt data (restriction in range) may have impacted on our ability to detect significant relationships between these variables. The highest correlations between perceived legitimacy and likelihood of behaviour scores were found for speeding and driving while fatigued, respectively. These behaviours also had the highest likelihood means. These results suggest that it may be possible to reduce speeding and driving while fatigued if efforts are made to increase the perceived legitimacy of enforcement of these behaviours. This may involve public education regarding the risks of these

behaviours, and information about the purpose and effectiveness of associated enforcement. In the case of speeding, providing the public with information about how money the government receives from speeding fines is used may also increase perceived legitimacy of the speed enforcement program. The strongest correlations between attitudes and likelihood of behaviour scores were also found for speeding and fatigued driving, respectively. Again, public education about the crash risks of these behaviours may reduce positive attitudes toward these behaviours, and in turn reduce intentions to engage in these behaviours in the future. The lower correlations between drink driving variables may reflect the previous success of campaigns targeting this behaviour. Likelihood of engaging in drink driving was low, perceived legitimacy of drink driving laws was high, and attitudes toward drink driving were negative in this sample, with small variability. However, it is important to maintain focus on drink driving to ensure these gains are maintained (e.g., Homel, 1986).

The strongest correlations observed in this study were found between perceived legitimacy and attitudes scores. This shows that high perceived legitimacy of enforcement is associated with negative attitudes toward the behaviour. However, the causal nature of the relationship cannot be determined. It is not possible using this data to ascertain whether positive attitudes mean a person is likely to consider enforcement as less legitimate, or whether perceptions that enforcement is not legitimate (or perhaps excessive) may lead to a person having more positive attitudes toward the behaviour. Both variables may be influenced by another. For example, cognitive dissonance would suggest that a person who engages in a behaviour is likely to hold positive attitudes toward it (Festinger & Carlsmith, 1959). If one is positive about a behaviour, they are unlikely to also be positive about enforcement of it. The largest correlation found in the current study was between attitudes toward speeding and the perceived legitimacy of enforcement of speeding. This is a promising target for intervention, as previous work by McKenna (2007a) has shown that speeding interventions targeting attitudes increase individuals' perceived legitimacy of speeding enforcement.

There are several limitations of the current study that require consideration in future research. First, the sampling methodology utilised a convenience sample. That is, participants were not randomly selected for participation in the study and as such, self-selection bias may have occurred. The analyses should be replicated with a broader sample (i.e., with a more representative range of compliant and less compliant drivers) to confirm the results. Second, the data obtained was via self-report and given the sensitive nature of the collected data (i.e., illegal driving behaviours), social desirability effects could have affected the obtained results (Wählberg, Dorn, & Kline, 2010). However, the current study utilised an online questionnaire where participant's anonymity was assured. Research suggests that the effect of social desirability is less prominent when questionnaires are completed in a private environment as opposed to a public environment (Lajunen & Summala, 2003; Sullman & Taylor, 2010). Third, only simple statistical analyses were conducted due to the exploratory nature of the research. Future research is required to refine the measures (particularly measures of perceived legitimacy of traffic law enforcement, which are comparatively novel relative to measures of the other study variables), and determine their psychometric properties before more sophisticated analyses can be used to better understand the relationships between the variables. Finally, this study did not attempt to measure actual behaviour of respondents, opting to measure likelihood of future behaviour. Validation of measures in future research should include an examination of the extent to which self-reported likelihood of behaviour is related to actual behaviour, although the behavioural intention literature suggests that the relationship between self-reported intention to commit illegal behaviour and actual behaviour ranges between Pearson's  $r = .79$  and  $.83$  (Green, 1989; Kim & Hunter, 1993).

## Conclusion and recommendations

Self-reported likelihood of behaviour, perceived legitimacy of enforcement and attitudes differ between drink driving, speeding, driving while fatigued and driving without a seatbelt. The strength of the association between study variables also differs between the behaviours, which has implications for how the variables can inform interventions designed to reduce these high-risk behaviours and associated crashes. As most of the relationships between variables were moderate in magnitude, future research is required to better understand how these factors influence each other to inform the development of multivariate predictive models. Moreover, a qualitative research methodology could provide some in-depth data which is not feasible with the quantitative research method used in this study. It was previously mentioned that the level of perceived legitimacy can be increased by an intervention (McKenna, 2007a). As such, assessing the level of perceived legitimacy of Australian interventions could be beneficial to assess the effectiveness of such interventions. In this regard, work is needed to develop valid and reliable measures of perceived legitimacy. Longitudinal methodologies to assess the long-term effectiveness of such programs may also be valuable. Last, other undesirable road behaviours such as drug driving, hooning, and driver aggression should similarly be examined with this paradigm.

## Acknowledgements

This research was conducted as a Postgraduate Diploma in Psychology group project at the Centre for Accident Research and Road Safety – Queensland (CARRS-Q). The assistance of Nathan Dovan, Gabrielle Stephenson and Janelle Trenorden in survey development and data collection is gratefully acknowledged. Conference attendance was funded by CARRS-Q.

## References

- Adams, J. (1985). *Risk and freedom: The record of road safety regulation*. Great Britain: Transport Publishing Projects.
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior & Human Decision Processes*, 50(2), 179.
- Akers, R. L. (1990). Rational choice, deterrence, and social learning theory in criminology: The path not taken. *The Journal of Criminal Law and Criminology*, 81, 653-676.
- Akers, R. L., Krohn, M. D., Lanza-Kaduce, L., & Radosevich, M. (1979). Social learning and deviant behavior: A specific test of a general theory. *American Sociological Review*, 44(4), 636-655.
- Australian Transport Council. (2011). *National Road Safety Strategy 2011 – 2020*. Canberra, Australia: Australian Transport Council.
- Dula, C. S., Dwyer, W. O., & LeVerne, G. (2007). Policing the drunk driver: Measuring law enforcement involvement in reducing alcohol-impaired driving. *Journal of Safety Research*, 38, 267-272.
- Elvik, R., & Vaa, T. (2004). *The handbook of road safety measures*. Amsterdam: Elsevier.
- Fernandes, R., Hatfield, J., & Job, S. (2010). A systematic investigation of the differential predictors for speeding, drink-driving, driving while fatigued, and not wearing a seat belt, among young drivers. *Transportation Research Part F: Traffic Psychology and Behaviour*, 13(3), 179-196. doi: 10.1016/j.trf.2010.04.007
- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology*, 58, 203-210.
- Fleiter, J. J., Watson, B. C., Lennon, A. J., King, M. J., & Shi, K. (2009). *Speeding in Australia and China : a comparison of the influence of legal sanctions and*

- enforcement practices on car drivers*. Paper presented at the Proceedings of the 2009 Australasian Road Safety Research, Policing and Education Conference : Smarter, Safer Directions, Sydney Convention and Exhibition Centre, Sydney, New South Wales.
- Fletcher, A., McCulloch, K., Baulk, S. D., & Dawson, D. (2005). Countermeasures to driver fatigue: A review of public awareness campaigns and legal approaches. *Australian and New Zealand Journal of Public Health, 29*, 471-476.
- Gee Kee, A., Steinhardt, D. A., & Palk, G. (2007). *Hoon driving: predicting willingness to be involved from social learning and deterrence perspectives*. Paper presented at the 2007 Road Safety: Research, Policing, Education Conference, 17-19th October, Melbourne, Australia.
- Green, D. E. (1989). Measures of Illegal Behavior in Individual-Level Deterrence Research. *Journal of Research in Crime and Delinquency, 26*(3), 253-275. doi: 10.1177/0022427889026003004
- Harris, J. S., Jolly, B. T., & Runge, J. W. (1999). Speeding and Other Unsafe Driving Actions. *Annals of Emergency Medicine, 34*(6), 799-800.
- Homel, R. (1986). *Policing the drinking driver: Random Breath Testing and the process of deterrence*. Canberra: Federal Office of Road Safety.
- Homel, R. (1988). *Policy and punishing the drinking driver: A study of general and specific deterrence*. New York: Springer-Verlag.
- Homel, R. (1990). Random breath testing the Australian way: A model for the United States? *Alcohol Health and Research World, 14*, 70.
- Jones, C. B., Rajaratnam, S. M. W., Dorrian, J., & Dawson, D. (2010). Lay Perceptions of Responsibility and Accountability for Fatigue-Related Road Crashes. *Journal of the Australasian College of Road Safety, 21*(1), 30-35.
- Kim, M.-S., & Hunter, J., E. (1993). Attitude-Behavior Relations: A Meta-Analysis of Attitudinal Relevance and Topic. *The Journal of Communication, 43*(1), 101-142.
- Lajunen, T., & Summala, H. (2003). Can we trust self-reports of driving? Effects of impression management on driver behaviour questionnaire responses. *Transportation Research Part F: Traffic Psychology and Behaviour, 6*(2), 97-107.
- Loxley, W., Saunders, B., Blaze-Temple, D., & Binns, C. (1990). Drinking and driving in Western Australia: Perceptions of practices, priorities and preventives. *Australian Journal of Social Issues, 25*, 120-136.
- McKenna, F. P. (2007a). *Do attitudes and intentions change across a speed awareness workshop?* . Paper presented at the Behavioural Research in Road Safety XVII
- McKenna, F. P. (2007b). The perceived legitimacy of intervention: A key feature for road safety *Improving Traffic Safety Culture in the United States: The Journey Forward* (pp. 77-91). Washington, DC: AAA Foundation for Traffic Safety.
- Nichols, J. L., & Ross, H. L. (1990). The effectiveness of legal sanctions in dealing with drinking drivers. *Alcohol, Drugs and Driving, 6*(2), 33-60.
- Nordbakke, S., & Sagberg, F. (2007). Sleepy at the wheel: Knowledge, symptoms and behaviour among car drivers. *Transportation Research Part F: Traffic Psychology and Behaviour, 10*(1), 1-10.
- Pennay, D. (2008). Community Attitudes to Road Safety: 2008 survey report. Canberra, Australia: Australian Government Department of Infrastructure, Transport, Regional Development and Local Government.
- Poulter, D. R., & McKenna, F. P. (2007). Is speeding a "real" antisocial behavior? A comparison with other antisocial behaviors. *Accident Analysis & Prevention, 39*(2), 384-389.

- Queensland Police Service. (2010). Media Release: New 'Fatal Four' cars a stark reminder to stay safe this Christmas. Retrieved from <http://www.police.qld.gov.au/News+and+Alerts/Media+Releases/2010/12/05fatalfourcars.htm>
- Sherman, L. W. (1993). Defiance, deterrence, and irrelevance: A theory of the criminal sanction. *Journal of research in Crime and Delinquency*, 30, 445-473.
- Sullman, M. J. M., & Taylor, J. E. (2010). Social desirability and self-reported driving behaviours: Should we be worried? *Transportation Research Part F: Traffic Psychology and Behaviour*, 13(3), 215-221.
- Sweedler, B. M., Biecheler, M. B., Laurell, H., Kroj, G., Lerner, M., Mathijssen, M. P. M., . . . Tunbridge, R. J. (2004). Worldwide Trends in Alcohol and Drug Impaired Driving. *Traffic Injury Prevention*, 5, 175-184.
- SWOV. (2011). Penalties in traffic. Retrieved from [http://www.swov.nl/rapport/Factsheets/UK/FS\\_Penalties\\_in\\_traffic.pdf](http://www.swov.nl/rapport/Factsheets/UK/FS_Penalties_in_traffic.pdf)
- Taxman, F. S., & Piquero, A. (1998). On preventing drunk driving recidivism: An examination of rehabilitation and punishment approaches. *Journal of Criminal Justice*, 26, 129-143.
- Transport and Main Roads. (2012). Queensland Road Toll Weekly Report Retrieved from <http://www.tmr.qld.gov.au/Safety/Transport-and-road-statistics/Road-safety-statistics.aspx>
- Vanlaar, W., Simpson, H., Mayhew, D., & Robertson, R. (2008). Fatigued and drowsy driving: A survey of attitudes, opinions and behaviors. *Journal of Safety Research*, 39, 303-309.
- Wählberg, A. E. a., Dorn, L., & Kline, T. (2010). The effect of social desirability on self reported and recorded road traffic accidents. *Transportation Research Part F: Traffic Psychology and Behaviour*, 13(2), 106-114. doi: 10.1016/j.trf.2009.11.004
- Watling, C. N., Palk, G. R., Freeman, J. E., & Davey, J. D. (2010). Applying Stafford and Warr's reconceptualization of deterrence theory to drug driving: Can it predict those likely to offend? *Accident Analysis & Prevention*, 42(2), 452-458. doi: 10.1016/j.aap.2009.09.007
- Watson, B. C. (2004). *How effective is deterrence theory in explaining driver behaviour: A case study of unlicensed driving*. Paper presented at the Road Safety Research, Policing and Education Conference, 14 - 16 November, 2004, Perth, Western Australia.