

TITLE

Mileage, car ownership, experience of punishment avoidance and the risky driving of young drivers

AUTHORS AND AFFILIATIONS

Scott-Parker, B. ^{1,3}, Watson, B. ^{1,3}, King, M. J. ^{1,3}, & Hyde, M. K. ^{2,3}

¹ Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology

² School of Psychology and Counselling, Queensland University of Technology

³ Institute of Health and Biomedical Innovation (IHBI), Queensland University of Technology

Complete Mailing and Email Addresses

Bridie Scott-Parker Email: b.scott-parker@qut.edu.au

(Corresponding Author) Postal Address: Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology, K Block, 130 Victoria Park Road, Kelvin Grove, Queensland, 4059, Australia.

Barry Watson Email: b.watson@qut.edu.au

Postal Address: Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology, K Block, 130 Victoria Park Road, Kelvin Grove, Queensland, 4059, Australia.

Mark J King Email: mark.king@qut.edu.au

Postal Address: Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology, K Block, 130 Victoria Park Road, Kelvin Grove, Queensland, 4059, Australia.

Melissa K Hyde Email: mk.hyde@qut.edu.au

Postal Address: School of Psychology and Counselling, Queensland University of Technology, O Block B Wing, Victoria Park Road, Kelvin Grove, Queensland, 4059, Australia.

ABSTRACT

Objective Young drivers are at greatest risk of injury or death from a car crash in the first six months of independent driving. In Queensland, the graduated driver licensing (GDL) program was extensively modified in July 2007 in order to reduce this risk. Increased mileage and car ownership have been found to play a role in risky driving, offences and crashes; however GDL programs typically do not

consider these variables. In addition, young novice drivers' experiences of punishment avoidance have not previously been examined. The paper explores the mileage (duration and distance), car ownership and punishment avoidance behaviour of young newly-licensed intermediate (Provisional) drivers and their relationship with risky driving, crashes and offences.

Methods Drivers ($n = 1032$) aged 17-19 years recruited from across Queensland for longitudinal research completed Survey 1 exploring pre-licence and Learner experiences and sociodemographic characteristics. Survey 2 explored the same variables with a subset of these drivers ($n = 341$) after they had completed their first six months of independent driving.

Results Most young drivers in Survey 2 reported owning a vehicle and paying attention to Police presence. Drivers who had their own car reported significantly greater mileage and more risky driving. Novices who drove more kilometres, spent more hours each week driving, or avoided actual and anticipated Police presence were more likely to report risky driving. These drivers were also more likely to report being detected by Police for a driving-related offence. The media, parents, friends and other drivers play a pivotal role in informing novices of on-road Police enforcement operations.

Conclusions GDL programs should incorporate education for the parent and novice driver regarding the increased risks associated with greater driving particularly where the novices own a vehicle. Parents should be encouraged to delay exclusive access to a vehicle for the novice driver. Parents should also consider whether their young novice will deliberately avoid Police if they tell them their location. This may reinforce not only the risky behaviour but also the young novice's beliefs that their parents condone this behaviour.

KEYWORDS

Young Drivers, Novice, Risky Driving, Car Ownership, Police, Exposure

INTRODUCTION

Young novice drivers around the world are injured and killed in road crashes at rates that far exceed those of older, more experienced drivers. In Queensland, Australia, the graduated driver licensing (GDL) program was extensively modified in July 2007. It aims to minimise novice drivers' risk by requiring a minimum amount of supervised driving practice followed by a gradual reduction in driving restrictions as the novice gains more driving experience. Key components of the enhanced GDL program include the introduction of a minimum 12 month Learner period during which 100 hours of supervised driving practice must be certified in a logbook, 10 hours of which must be at night. The

Provisional (intermediate) phase was also enhanced, and all Provisional drivers are prohibited from driving a high-powered (performance) vehicle, including those with eight or more cylinders. (Queensland Transport, 2007). The novice first progresses to a Provisional 1 (P1) licence which also must be held for a minimum of 12 months. P1 novices are unable to carry more than one passenger (excluding family members) between 11pm and 5am. P1 drivers must pass a hazard perception test to progress to a Provisional 2 (P2) licence which must be held for a minimum of 24 months, before progressing to an Open (unrestricted) licence (Queensland Transport, 2007). Traditionally the Learner phase is a relatively safe period for the novice driver, with the greatest risk of injury or death from a car crash occurring during the first six months of independent driving. In Queensland in 2008, 3.7% of drivers held a Learner licence, and only 1.5% of drivers involved in a fatal crash had a Learner licence. In comparison, 6.0% of drivers held a Provisional licence, whilst these drivers were involved in 11.8% of fatal crashes that year (Department of Transport and Main Roads, 2010a).

In addition to their age (Braitman et al. 2008) and associated neurological (Steinberg, 2008) and psychosocial (Keating, 2007) maturation and underdeveloped hazard perception skills (Lee et al. 2008), a number of behavioural and motivational factors have been found to influence the risky behaviour of young novice drivers, which in turn places them at greater risk of injury or fatality in a road crash. These influences include variables such as exceeding speed limits (Blows et al. 2005), driving at night (Ward et al. 2005), and the influence of friends who frequently travel as their passengers (Scott-Parker et al. 2009).

Vehicle ownership has also emerged in the literature as a contributing variable, with high levels of vehicle ownership and primary access to a vehicle found amongst the most inexperienced and youngest drivers. Between 28% (Cammisa et al. 1999) and 70% (Garcia-Espana et al. 2009) of novices reported having either their own vehicle or primary access to a vehicle at licensure, with ownership rates increasing during the intermediate period (Williams et al. 2006). Different methodologies including surveys, interviews, instrumented vehicles and travel diaries in cross sectional and longitudinal research have revealed that car ownership is associated with more risky driving behaviour such as speeding (e.g., Cammisa et al., 1999; Garcia-Espana et al., 2009), particularly at night and whilst carrying their friends as their passengers (e.g., Klauer et al. 2011), crashes (e.g., Williams et al., 2006) including 'hooning' crash involvement (e.g., Palk et al. 2011), offences (e.g., Hirsch et al. 2006), and greater mileage (e.g., Leaf et al. 2008). Moreover, greater

duration of ownership corresponds to more offences by and crashes involving young novice drivers (Williams et al., 2006). As noted above, the GDL program in Queensland was considerably enhanced in July 2007. Whilst GDL programs have proven to be effective in reducing the road crash involvement of young novice drivers, these drivers continue to be overrepresented in crash statistics. Vehicle ownership and mileage have been found to be contributing variables, and the vehicle ownership and mileage characteristics of young novice drivers in the enhanced GDL program remain unknown.

In contrast, a behaviour which has not received much attention is young novice drivers' avoidance of Police traffic law enforcement operations, and the relationship of this behaviour with risky driving, crashes and offences. Avoiding Police allows the novice to evade detection for driving related offences such as drink driving, speeding and driving without a license, and other offences such as illegal vehicle modifications and the operation of performance vehicles (Scott-Parker et al. under review a). A number of recent studies framed within Akers' social learning theory and deterrence theory have confirmed that the experience of punishment avoidance is a strong predictor of illegal and risky driving behaviour such as speeding (e.g., Fleiter & Watson, 2005). Avoidance of Police requires the novice driver to 'pay attention' to Police presence. In Queensland, traffic reports are broadcast on radios, frequently in conjunction with general news reports and more often during peak hour commute times. These broadcasts not only inform drivers of traffic congestion and commuting delays, but notify drivers of the roads upon which Police currently have speed enforcement, and occasionally alcohol breath testing, operations. Drivers also are able to telephone radio stations to report Police operations that have not previously been identified in the broadcast(s). In recent times Facebook pages have increasingly contained information regarding Police presence (PerthNow, 2011), whilst mobile phone apps can alert drivers to active, targeted Police enforcement activities (Lowensohn, 2008). In addition, a proportion of drivers 'flash' their headlights at the oncoming traffic to warn drivers that they are entering a segment of road in which Police are operating an enforcement program. Whilst 'flashing' is illegal (and punishable by 1 demerit point and a \$40 fine in Queensland, Department of Transport and Main Roads, 2010b), controversially Police in another Australian state have operated their vehicle lights to warn drivers of the presence of their speed camera as part of their negotiation for a salary increase (Dowsley & Buttler, 2011). Accordingly it is

important that the role paying attention to and avoiding of Police plays in the risky behaviour of young novice drivers is examined, and such an investigation is timely in light of recent Police actions.

This paper will explore the self-reported mileage, Police avoidance experiences and car ownership characteristics of young novice drivers progressing through an enhanced GDL program in relation to their risky driving at three time points: 1) before they obtain their Learner driver's licence ('pre-Licence' driving); 2) as a Learner driver; and 3) during the first six months of independent driving with a Provisional (P1) licence. This risky driving includes self-reported crashes and offences. In addition, whilst it appears that 'paying attention' to Police presence is normative in the general Queensland driving culture, it is unknown if this behaviour is related to the driving behaviour of young novices, such as evading punishment. The manner in which the young novice driver becomes aware of actual and anticipated Police presence also has not been examined. Accordingly the paper will also explore the phenomenon of paying attention to and avoidance of Police presence on Queensland roads. In addition, other forms of punishment avoidance such as the novice "talking their way out of a ticket" when they had been pulled over by Police, or parents claiming they were the driver in the instance of camera-detected offences (where the vehicle is identified, not the driver), will also be investigated.

Road safety researchers have suggested that novice drivers with their own car may be predisposed to risky driving behaviour, and that the vehicle allows the operationalisation of this tendency (e.g., Cammisa et al. 1999; Klauer et al. 2011). This predisposition pertains to both psychological states and traits. The psychological state of the novice, specifically their depression and anxiety, has been found to explain risky driving behaviour (Scott-Parker et al. 2011). The psychological traits of sensitivity to reward and sensation seeking propensity have also been found to explain risky driving behaviour (Scott-Parker et al. in press). The relationships between anxiety, depression, sensitivity to reward and sensation seeking propensity, and vehicle ownership, driving exposure, paying attention to, and avoiding Police presence have not been explored.

METHODS

Participants

One thousand and thirty-two drivers (609 females, 423 males) aged 17 to 19 years ($M = 17.43$, $SD = 0.67$) volunteered to complete the 30-minute Survey 1. They had just passed their Q-Safe Practical Driving Assessment and progressed from a Learner to a P1 driver's licence. Six

months later, 355 of the novice drivers (108 males, 247 females) aged 17 to 20 years ($M = 17.83$, $SD = 0.91$) completed Survey 2. Car ownership information was provided by 341 of these drivers.

Whilst 34.4% of the Learner participants were retained for the second survey, much of this attrition can be attributed to the extreme weather conditions (torrential rain, extensive flooding, and cyclones) which resulted in 99% of the state being declared a disaster area (AAP, 2011). Numerous areas of the state were characterised by widespread and sometimes long-term loss of access to electricity, and therefore the email and internet access necessary for the surveys was also not available. Chi-square analyses were undertaken to compare the sociodemographic characteristics of the Learners who completed the second survey to the Learners who did not. The Learners who completed both surveys were significantly more likely to be female and to be studying. No other significant differences were found.

Materials

The cross-sectional surveys included nine sociodemographic questions (see Tables 1 and 2). In Survey 1, novices self-reported if they had driven on-road before obtaining a Learner's licence (*pre-Licence driving*), the amount of *difficulty* they experienced obtaining supervised driving practice when they were a Learner (1 = *very difficult*, 5 = *very easy*), the *number of logbook hours* recorded while on their Learner driver's licence, the *duration* that the Learner driver's licence was held, and if they drove *unsupervised* on their Learner's licence. In both surveys, drivers reported if they had been involved in a *crash* or detected by Police for a driving *offence*, if they *paid attention* to or *avoided* the Police, and if they had *talked their way out of a ticket* or their *parents had taken the punishment* (which may include a monetary fine and/or penalty points) on their behalf. Novices also completed the Behaviour of Young Novice Drivers Scale (BYNDS) (Scott-Parker et al. 2010) (Cronbach's α Survey 1 = .88, Survey 2 = .92) in both surveys using a Likert scale ranging from 1 (*never*) to 5 (*nearly all the time*). Higher scores on the BYNDS indicate more risky driving behaviour. Survey 2 also investigated the intermediate novice's *driving exposure*: *duration* measured as the number of hours in a typical week during the last month; *distance* measured as the number of kilometres in a typical week during the last month; *consistency* measured by the novice indicating when they drove more (when initially obtained Provisional licence/ consistently throughout/ recently). Both surveys incorporated the Brief Sensation Seeking Scale (Hoyle et al. 2002), higher scores indicating greater sensation seeking propensity; an abridged Sensitivity to Reward Questionnaire (Scott-Parker et al. under review b); and

Kessler's psychological distress scale (Kessler & Mroczek, 1994, cited in Andrews & Slade, 2001), higher scores indicative of greater anxiety and depression.

Design and Procedure

Participants were recruited from across Queensland as they progressed from supervised to independent driving. Every person in Queensland who passed their Practical Driving Assessment and progressed from a Learner to a P1 licence between 1 April and 30 June 2010 received a flyer from the government licensing centre inviting them to participate in a larger research study. This longitudinal project was designed to investigate the novice drivers' sociodemographic characteristics; their driving attitudes and experiences within the GDL program; and a range of psychosocial influences upon their driving behaviour (herein the participants who responded to Survey 1 are referred to as Learner drivers). After six months had elapsed, Learner drivers were offered the opportunity to complete Survey 2, exploring the same sociodemographic and driving experiences in the context of being a Provisional (intermediate) driver (herein those participants responding to Survey 2 are referred to as Provisional drivers). To ensure that the participants had progressed through the enhanced GDL program *only*, novices who reported being 19 years of age or less at the time of Survey 1, and novices who reported that they were 20 years of age or less at the time of Survey 2, were included in the analyses. Both online survey tools were administered using KeySurvey Enterprise Online Survey Software.

Statistical Analysis

Means were compared using either analysis of variance (ANOVA) or the non-parametric Kruskal-Wallis test depending on the normality of the variables in question. The Pearson chi-square test was used for analysing the categorical variables. Bivariate correlations between continuous variables utilised Pearson's product moment correlation (r). Missing data was not imputed; rather cases were deleted pair-wise as appropriate. All analyses were evaluated at a significance level of $\alpha = .05$. Analyses were conducted using PASW version 18.0.

RESULTS

Most Provisional drivers reported they owned their own vehicle (78.4%). Whilst they reported driving an average of 174.8km ($SD = 162.98$) each week, 52% reported driving 100km or less each week. Driving occupied 7.38 hours ($SD = 9.01$) of their time each week, with 86.7% of Provisional drivers reporting driving for 10 or less hours each week. There were no significant differences in

exposure according to gender (males: mileage $M = 190.2\text{km}$, duration $M = 7.3$ hours; females: mileage $M = 167.9\text{km}$, duration $M = 7.4$ hours) nor residential location (rural: mileage $M = 183$ km, duration $M = 7.0$ hours; urban: mileage $M = 170$ km, duration $M = 7.7$ hours). Greater exposure was associated with more self-reported risky driving (BYNDS composite cf. hours $r = .20$, $p < .001$; BYNDS composite cf. kilometres $r = .27$, $p < .001$). The majority of Provisional drivers (46.5%) reported that their driving exposure was similar throughout the six months of their intermediate licence, whilst 36.8% reported greater exposure recently and the remaining 16.7% reported greater exposure when they first progressed from a Learner to a Provisional driver's licence. Ten percent of male and female novices reported crash involvement, whilst more males (18.1%) than females (10.1%) reported they had been detected for a driving offence, as a Provisional driver.

Ninety-one percent of Learner drivers, and 72% of Provisional drivers reported they paid attention to reports of Police presence on the road. The most common mechanisms of the Provisional driver hearing about Police presence were via the radio and news reports (100 Provisional drivers), friends (68 Provisional drivers), family (57 Provisional drivers), seeing them on the side of the road (52 Provisional drivers), and other drivers flashing their lights (26 Provisional drivers). There were no significant gender differences in the extent to which Provisional drivers reported paying attention to Police presence. Sixteen percent of Learner and Provisional drivers reported that they avoid the areas where Police are, or are likely, to be. Males (25.0%) were significantly more likely to report that they avoided actual and anticipated Police presence as Provisional drivers than females (12.7%), and Provisional drivers from rural areas also reported more avoidance (23.4%) than those from urban areas (15.1%).

Tables 1 and 2 summarise the sociodemographic and driving behaviour variables for the Provisional driver according to their car ownership as a Provisional driver. Drivers who were born in Australia, lived in an English-speaking home, were not studying and who were employed were significantly more likely to own a car, as were novices who reported a shorter duration of the Learner licence and more hours recorded in their Learner logbook. Provisional drivers with their own car reported significantly greater driving exposure as measured by the number of kilometres driven recently, and to report they had 'talked their way out of a ticket' (punishment avoidance) as a Provisional driver.

Whilst there was a significantly greater incidence of self-reported risky driving (BYNDS) by Provisional drivers who owned their own car, upon closer examination the main risk factor appears to be their increased risky driving exposure (as measured by a subscale of the BYNDS). To illustrate, Provisional drivers with a car were significantly more likely to report driving at times and in circumstances that are particularly risky for young novice drivers, such as on the weekend, at night, and with their friends as their passengers.

There was no difference in car ownership according to driver gender or relationship status. Provisional drivers who were younger and consequently less educated, and who resided in rural areas reported greater car ownership, as did drivers who reported they did not engage in pre-Licence driving, did not engage in unsupervised driving as a Learner, and avoided Police as a Provisional driver; however these differences were not statistically significant. In addition, there were no differences in sensation seeking propensity, reward sensitivity, depression and anxiety.

Most crashes ($n = 33$, 95%) were reported by Provisional drivers residing in urban areas. Provisional drivers who reported being involved in a crash as a Learner driver ($n = 11$) were less likely to report they owned a car, whilst Provisional drivers who reported being detected for an offence as a Learner driver ($n = 8$) or a Provisional driver ($n = 43$) and being involved in a crash ($n = 35$) as a Provisional driver were more likely to report owning a car. While these differences were not statistically significant, the small sample size at follow-up may have precluded reliable analyses.

Table 3 summarises the sociodemographic and driving behaviour variables for the Provisional driver according to their reported driving exposure (distance and duration) as a Provisional driver. The young drivers who had been detected for a driving offence as a Provisional driver reported significantly greater duration and distance of driving exposure. The young Provisional drivers who had talked themselves out of a ticket reported significantly greater weekly driving distance, whilst drivers whose parents had taken the fine on their behalf reported significantly greater weekly driving duration. Although not statistically significant, more exposure (both kilometres and duration) was associated with self-reported pre-Licence driving, crashes and unsupervised driving as a Learner, and talking oneself out of a ticket and crashes as a Provisional driver.

Drivers who reported more exposure when they were first licensed (10.7%), or throughout their Provisional period (12.0%), reported more crash involvement than novices who reported more exposure recently (8.1%). In comparison, more offences were detected for those drivers with greater

recent exposure (13.5%) than those with more exposure when they were first licensed (10.5%). A similar pattern of paying attention to and avoiding Police presence was found (greater recent exposure: 74.4% pay attention, 18.4% avoid Police; similar exposure throughout: 70.3% pay attention, 15.2% avoid Police; greater initial exposure: 68.4% pay attention, 15.8% avoid Police).

Tables 1 and 2 also summarise the sociodemographic and driving behaviour variables for the Provisional driver according to whether they reported paying attention to Police presence or not as a Provisional driver. Young Provisional drivers who reported paying attention to warnings about Police presence on the road were significantly more likely to be born in Australia, educated above a Senior (Year 12) level, and employed. They were also significantly more likely to have been detected for an offence, have had their parents 'taken the punishment' and to have been involved in a crash as a Learner, to avoid Police and to report more risky driving (transient violations such as speeding) as a Provisional driver. Provisional drivers who paid attention to Police presence reported significantly greater reward sensitivity.

Tables 1 and 2 also summarise the sociodemographic and driving behaviour variables for the Provisional driver according to their avoidance of actual and anticipated Police presence as a Provisional driver. Young Provisional drivers who reported avoiding Police presence on the roads were significantly more likely to have reported risky driving as a Provisional driver (BYNDS composite and four of the five subscales), to have had less difficulty obtaining Learner driving practice, and to have talked themselves out of a ticket. They were also significantly more likely to be male, to have driven unsupervised as a Learner, and to pay attention to Police presence. Provisional drivers reported significantly greater sensation seeking propensity and sensitivity to reward.

DISCUSSION

Consistent with previous research (Garcia-Espana et al., 2009), the young novice drivers in this study reported a relatively high rate of vehicle ownership, particularly for those who were employed (Cammisa et al. 1999; Garcia-espana et al. 2009) and had greater driving exposure (Ehsani et al. 2010; Leaf et al. 2009; Williams et al. 2006). Contrary to prior research (Garcia-Espana et al. 2009), higher rates of ownership were found for rural drivers. In addition, young novices reported greater exposure than previous research has indicated (e.g., Lee et al. 2011), which is particularly important as self-reported exposure is likely to be underestimated (Leaf et al. 2008) and,

in the circumstance of the current research, much of the state was experiencing an exceptionally wet summer which may have affected the nature of recent journeys.

Interestingly novices who crashed as a Learner reported less car ownership as a Provisional driver. It may be that these novices had been and continue to be punished by their parents, that they have had a negative emotional response to the crash (Scott-Parker et al. under review a), or that they had crashed the family's 'spare car' which would have otherwise been given to the Provisional driver for their own use. In contrast, every Learner who had been detected for an offence subsequently owned a car as a Provisional driver. Provisional drivers with a car reported a shorter Learner duration and more hours recorded in their Learner logbook, suggesting that the novice and/or their parents were highly motivated to progress from the Learner licence to a Provisional licence, and vehicle ownership may have been fundamental to this process. Again, the availability of the 'spare' family car may have been influential. Graduated licensing programs such as Queensland's enhanced GDL program do not consider car ownership and the nature of young novice driver exposure, and the results suggest that vehicle ownership and driving exposure warrant further consideration.

Young novice drivers need to gain as much on-road driving experience as possible; however this exposure also places the novice at risk on the road (Williams et al. 2006). In addition, some types of exposure are more inherently risky than others, such as driving at night on the weekend, and the participants who owned their car had undertaken more driving in these conditions. . Moreover, travelling as a passenger of a young novice driver also places the young person at risk. Both young novice drivers and their parents need to be educated regarding the increased risk associated with intermediate driving exposure and vehicle ownership, and where possible the newly-licensed novice should be encouraged to share a family vehicle rather than have a car for their exclusive access (Garcia-Espana et al. 2009). Also, the family car may be a safer vehicle than the kind of vehicle they could afford to purchase themselves (Williams et al. 2006). In addition, the role of the young novice in the family frequently changes upon licensure, with broader responsibilities including driving (Best, 2006). Parents of young novice drivers should be encouraged to continue monitoring their child's driving after licensure, and in particular the nature and extent of the novice's driving exposure in the early stages of intermediate driving.

The research findings suggest that paying attention to police presence appears to be normative for young novice drivers. As a consequence, novices report they were less risky drivers in

general. In contrast, some novices reported they became 'smarter' by temporarily reducing the riskiness of their behaviour within the vicinity of the Police presence only, or by avoiding these areas altogether (Scott-Parker et al. under review a). Whilst most novices in this study reported paying attention to Police presence, the small proportion of novices who reported actually avoiding Police presence appeared to be more risky drivers in general, which is consistent with prior research (Fleiter & Watson, 2005). The study findings suggest that parents and friends play a pivotal role in providing information regarding Police presence. Parents and friends should be encouraged to not provide this information so that the novice is a less risky driver in general. Rather than facilitating young novice driver's risky behaviour by providing information about Police presence, parents and friends should encourage compliance with speed limits at *all* times as the novice can never be completely certain that the Police will not be conducting an enforcement program on the roads they are travelling. Parents and friends should also discourage 'smarter risky behaviour', for example the circumstance where the novice avoids the Police and participates in street racing when they know that the Police are already engaged in enforcement activities in another area (Scott-Parker et al. under review a). In addition, parents are also the supervisors of Learners, and in this supervisory position they should not encourage nor support the Learner avoiding the Police whilst they are supervising. Facebook sites which alert drivers to the location of speed enforcement and random breath testing operations are controversial: the increased awareness is expected to result in desirable behaviour change of less speeding and less drink driving, however drivers who speed and drink drive may avoid these locations to avoid detection and come to rely on this as a means of breaking road rules with impunity.

The longitudinal analysis suggests that the traits of sensation seeking propensity and reward sensitivity, and the psychological states of anxiety and depression, do not influence vehicle ownership; rather ownership of a vehicle appears to allow these risky traits and states to influence the behaviour of the young Provisional driver. It appears that the greater sensitivity to reward is evidenced as punishment avoidance for the young novice driver, and further research should examine this phenomenon. Further research should also identify *when* the novice obtained their vehicle to determine if heretofore unrecognised temporal variables moderate these influences.

Future research should also explore the day of the week, the purpose of the journey, the duration and mileage of the journey, and the passenger carrying characteristics of the young Provisional driver during the first six months of independent driving. The reasons for vehicle

ownership could also be investigated. Recent research in Iceland suggests that journey logistics such as ease of travel and poor public transport alternatives, and psychosocial influences such as autonomy and self-identity are important (Collin-Lange & Benediktsson, 2010). Young novice drivers have also been found to own smaller, older cars which have less safety features in the event of a crash (Williams et al. 2006), and future research could investigate the characteristics of both the cars that novices have shared and those that they have exclusive access to, including how and when they obtained their 'own car'.

While the longitudinal nature of this research provides important insights into the behaviour of novice drivers, the research has a number of limitations which need to be borne in mind when interpreting the results. The surveys relied upon self-report data (however anonymity was likely to ameliorate any impression management concerns). As noted earlier, exposure estimates are likely to have been underestimates. There was an unusually high rate of attrition over the six month period of the research, with a greater proportion of female participants and those participants who were studying more likely to complete both surveys. Queensland experienced an unseasonably wet summer which culminated in 99% of the state being declared a disaster area (AAP, 2011) which was characterised by widespread and sometimes long-term loss of access to electricity, and therefore the email and internet access necessary for the surveys. The attrition resulted in the final sample being 70% female, and separate gender analyses were undertaken to mitigate the effects of this gender bias (with no gender differences).

A considerable proportion of the youngest most inexperienced drivers have their own car. Having a car was associated with risky behaviours such as greater driving exposure and higher rates of offences and crashes as a young Provisional driver. In addition, it appears normative for young novice drivers to pay attention to Police presence. Moreover a quarter of young male novice drivers actively avoided this Police presence. Further investigation of car ownership, exposure, attention and avoidance is required, and GDL programs including parent and novice driver education should consider the risky driving and punishment avoidance strategies and experiences of the young novice driver when they own their own car.

ACKNOWLEDGEMENTS

Special thanks to the Department of Transport and Main Roads (formerly Queensland Transport) for their assistance in the recruitment of participants for the research project. The first author is the

recipient of a National Health and Medical Research Council Postgraduate Research Scholarship. The research findings regarding vehicle ownership will be presented at the Australasian College of Road Safety Annual Conference, Melbourne Australia, in September 2011. The corresponding results will feature in the non-peer reviewed Conference Proceedings. There was no mention of paying attention to or avoiding actual and anticipated Police presence and the exposure characteristics of the young novices received only a cursory examination. Therefore the paper reports substantial additional dimensions and analyses for peer consideration and review.

REFERENCES

- AAP. (2011) Queensland 99 per cent Disaster-Declared as Flooded North Faces New Cyclone Threat. *The Courier Mail*, 11 March 2011.
- Andrews G, Slade, T. (2001) Interpreting Scores on the Kessler Psychological Distress Scale (K10). *Aust N Z J Public Health*, Vol 25, pp. 494-497.
- Best AL. (2006) Freedom, Constraint, and Family Responsibility. Teens and Parents Collaboratively Negotiate Around the Car, Class, Gender, and Culture. *J. Family Issues*, Vol. 30, pp. 55-84.
- Blows S, Ameratunga S, Ivers RQ, Lo SK, Norton R. (2005) Risky Driving Habits and Motor Vehicle Driver Injury. *Accid Anal Prev*, Vol. 37, pp. 619-624.
- Braitman KA, Kirley BB, McCartt AT, Chaudhary NK. (2008) Crashes of Novice Teenage Drivers: Characteristics and Contributing Factors. *J Safety Res*, Vol. 39, pp. 47-54.
- Cammisa MX, Williams AF, Leaf WA. (1999) Vehicles Driven by Teenagers in Four States. *J Safety Res*, Vol. 30, pp. 25-30.
- Collin-Lange V, Benediktsson K. (2010). Entering the Regime of Automobility: Car Ownership and Use by Novice Drivers in Iceland. *Journal of Transport Geography*, Vol. 19, pp. 851-858.
- Department of Transport and Main Roads. (2010a) Queensland Road Toll 2008. Queensland Government, Brisbane.
- Department of Transport and Main Roads. (2010b) Demerit Points Schedule. Queensland Government, Brisbane.
- Dowsley A, Buttler M. (2011) Defiant Cops Alert Drivers on Cameras. *The Herald Sun*, 9 June 2011..
- Ehsani JP, Bingham CR, Shope JT, Sunbury TM, Kweon B. (2010) Teen Driving Exposure in Michigan: Demographic and Behavioural Characteristics. *Accid Anal Prev*, Vol. 42, pp. 1386-1391.

Fleiter, J. J., Watson, B. C. (2005) The Speed Paradox: The Misalignment Between Driver Attitudes and Speeding Behaviour. Proceedings of the Australasian Road Safety Research, Policing and Education Conference, Wellington, New Zealand, 14-16 November.

Garcia-Espana JF, Ginsburg KR, Durbin DR, Elliott MR, Winston FK. (2009) Primary Access to Vehicles Increases Risky Teen Driving Behaviors and Crashes: National Perspective. *Paediatrics*, Vol. 124, pp. 1069-1075.

Hirsch P, Maag U, Laberge-Nadeau C. (2006). The Role of Driver Education in the Licensing Process in Quebec. *Traffic Inj Prev*, Vol. 7, pp. 130-142.

Hoyle RH, Stephenson MT, Palmgreen P, Lorch EP, Donohew RL (2002). Reliability and validity of a brief measure of sensation seeking. *Personality and Individual Differences*, Vol. 32, pp. 401-414.

Keating DP. (2007) Understanding Adolescent Development: Implications for Driving Safety. *J Safety Res*, Vol. 38, pp. 147-157.

Klauer SG, Simons-Morton B, Lee SE, Oiumet MC, Howard EH, Dingus TA. (2011) Novice Drivers' Exposure to Known Risk Factors during the First 18 Months of Licensure: The Effect of Vehicle Ownership. *Traffic Inj Prev*, Vol. 12, pp. 159-168.

Leaf WA, Simons-Morton BG, Hartos JL, Northrup VS. (2008) Driving Miles Estimates by Teen Drivers: How Accurate Are They? *Inj Prev*, Vol. 14, pp. 59-61.

Lee SE, Klauer SG, Olsen ECB, et al. (2008) Detection of Road Hazards by Novice Teen and Experienced Adult Drivers. *Transportation Research Record*, Transportation Research Board of the National Academies, Vol. 2078, pp. 26-32.

Lee SE, Simons-Morton BG, Klauer SE, Oiumet MC, Dingus TA. (2011) Naturalistic Assessment of Novice Teenage Crash Experience. *Accid Anal Prev*, Vol. 43, pp.1472-1479.

Lowensohn J. (2008) Trapster Turns your Cell Phone into a Police Detector. Retrieved 10 June 2011 from http://news.cnet.com/8301-17939_109-9904663-2.html.

Palk G, Freeman J, Gee Kee A, Steinhardt D, Davey J. (2011) The Prevalence and Characteristics of Self-Reported Dangerous Driving Behaviours Among a Young Cohort. *Transportation Research Part F*, Vol. 14, pp. 147-154.

PerthNow. (2011) Facebook friends avoid booze buses. *Perth Now*, 18 May 2011.

Queensland Transport. (2007) High-Powered (Performance) Vehicle Restriction. Retrieved 10 June 2011 from <http://www.tmr.qld.gov.au/Licensing/Getting-a-licence/Car-licence/Restrictions/High-powered-performance-vehicles.aspx>

Scott-Parker B, Watson B, King MJ. (2009) Understanding the Influence of Parents and Peers upon the Risky Behaviour of Young Drivers. *Transportation Research Part F*, Vol. 12, pp. 470-482.

Scott-Parker B, Watson B, King MJ. (2010). The Risky Behaviour of Young Drivers: Developing a Measurement Tool. Proceedings of the 24th Canadian Multidisciplinary Road Safety Conference, Niagara Falls, Canada, June 6-9, 2010.

Scott-Parker B, Watson B, King MJ, Hyde MK. (2011) The Psychological Distress of the Young Driver: A Brief Report. *Inj Prev*, Vol. 17(4), 275-277.

Scott-Parker B, Watson B, King MJ, Hyde MK. (in press) The Influence of Sensitivity to Reward and Punishment, Propensity for Sensation Seeking, Depression and Anxiety on the Risky Behaviour of Novice Drivers: A Path Model. *Br J Psychol*.

Scott-Parker B, Watson B, King MJ, Hyde MK (under review a) "They're Lunatics on the Road": Exploring the Normative Influences of Parents, Friends, and Police on Young Novice's Risky Driving Decisions. *Safety Science*.

Scott-Parker B, Watson B, King MJ, Hyde MK (under review b). A further exploration of sensation seeking propensity, reward sensitivity, depression, anxiety and the risky behaviour of young novice drivers in a structural equation model. The Influence of Sensitivity to Reward and Punishment, Propensity for Sensation Seeking, Depression, and Anxiety on the Risky Behaviour of Novice Drivers: A Path Model. *Br J Psychol*.

Steinberg L. (2008) A Social Neuroscience Perspective on Adolescent Risk-Taking. *Dev Rev*, Vol. 28, pp. 78-106.

Ward H, Shepherd N, Robertson S, Thomas M. (2005) *Night-Time Accidents: A Scoping Study*. AA Motoring Trust: London.

Williams AF, Leaf WA, Simons-Morton SG, Hartos JL. (2006) Vehicles Driven by Teenagers in their First Year of Licensure. *Traffic Inj Prev*, Vol. 7, pp. 23-30.

Table 1. The percentage of young novice drivers who own a car, attend to, and avoid Police presence on the road.

Key Measure		Own car	Attend	Avoid
<i>Sociodemographics</i>				
Gender ¹	Male	78.1	70.5	24.8**
	Female	78.6	72.0	12.7
Age ¹	17 years	79.9	32.1	18.2
	18 years	78.6	23.9	16.2
	19 years	75.0	25.9	13.0
	20 years	72.7	36.4	90.9
Australian-born ¹	Yes	80.8**	73.0*	16.4
	No	54.8	14.3	16.7
Speak English at home ¹	Yes	80.2**	72.5	15.9
	No	40.0	50.0	28.6
Marital Status ¹	Single	78.9	69.9	15.9
	Relationship	77.6	74.8	17.4
Education ¹	≤ Year 12	79.1	69.7	15.9
	Tertiary	74.5	82.4	19.6
Studying ¹	Yes	74.5*	72.0	14.5
	No	83.9	70.9	19.1
Employed ¹	Yes	82.5**	73.7	18.4
	No	67.1	64.7	10.6
Location ¹	Urban	77.1	71.0	17.4
	Rural	87.5	72.1	14.7
<i>Driving Behaviour: Pre-Licence</i>				
Pre-Licence driving ¹	Yes	75.6	80.5	17.1
	No	78.8	70.3	16.3
<i>Driving Behaviour: Learner Licence</i>				
Logbook accuracy ¹	Accurate	76.0*	70.0	16.3
	Inaccurate	87.5	77.5	21.4
Unsupervised Learner ¹	Yes	75.0	80.6	32.3
	No	78.8	70.6	14.8
Crash ¹	Yes	72.7	81.8	27.3
	No	78.4	71.3	15.9
Offence ¹	Yes	100.0	87.5	37.5
	No	77.8	71.3	15.7
<i>Driving Behaviour: Provisional Licence</i>				
'Talk out of' ticket ¹	Yes	100.0*	76.9	46.2*
	No	77.4	72.1	15.5
Parent 'took punishment' ¹	Yes	78.3	77.8	22.2
	No	88.9	72.1	16.5
Pay attention to Police ¹	Yes	80.9	–	20.9***
	No	77.0	–	5.2
Avoid Police ¹	Yes	77.4	91.1***	–
	No	80.2	67.7	–
Crash ¹	Yes	85.7	74.3	17.1
	No	77.3	71.4	16.4
Offence ¹	Yes	83.7	76.7	20.9
	No	77.6	70.8	15.8

Note: Significant differences evaluated at the level of .05 have been highlighted in bold for ease of reference. Sociodemographic characteristics were self-reported in Survey 2 (Provisional survey). – = not applicable. * $p < .05$, ** $p < .01$, *** $p < .001$. ¹ Analyses utilised Chi-square tests. ² Analyses utilised analysis of variance. ³ Analyses utilised Kruskal-Wallis tests.

Table 2. Means and standard deviations for the non-categorical survey items for a longitudinal sample of young novice drivers in Queensland, Australia.

Key Measure	Own car		Attend		Avoid		
	Yes	No	Yes	No	Yes	No	
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	
<i>Psychological Traits and States</i>							
Sensation seeking propensity (BSS) ¹	23.0 (6.6)	23.4 (6.7)	23.5 (6.6)	22.1 (6.6)	26.5 (6.8)	22.4 (6.4)***	
Sensitivity to Reward (Abridged SRQ) ¹	3.4 (2.4)	3.6 (2.5)	3.6 (2.4)	4.0 (2.3)*	5.0 (2.7)	3.1 (2.3)***	
Anxiety (K10 subscale) ¹	7.2 (2.8)	7.1 (2.5)	7.1 (2.8)	6.7 (2.4)	10.7 (4.7)	10.5 (4.4)	
Depression (K10 subscale) ¹	10.7 (4.6)	9.8 (3.8)	10.6 (4.8)	10.3 (4.2)	7.4 (2.9)	7.1 (2.7)	
<i>Driving Behaviour: Learner Licence</i>							
Practice difficulty ¹	3.6 (1.1)	3.4 (1.2)	3.5 (1.1)	3.5 (1.1)	3.2 (1.2)	3.6 (1.1)**	
Duration ²	15.8 (5.1)	18.7 (7.2)***	16.5 (5.7)	16.3 (6.1)	15.8 (5.2)	16.5 (5.9)	
Hours in logbook ²	107.0 (16.0)	102.5 (20.0)***	106.3 (18.1)	105.4 (14.5)	107.2 (20.2)	105.8 (16.5)	
<i>Driving Behaviour: Provisional Licence</i>							
Exposure ²	Hours	7.6 (8.8)	6.3 (9.8)**	7.6 (9.0)	6.8 (9.1)	6.4 (7.6)	7.6 (9.3)
	Kilometres	193.4 (170.2)	97.7 (96.8)***	183.3 (167.1)	152.4 (151.5)	170.0 (160.8)	176.3 (165.0)
BYNDS	Composite ¹	77.2 (15.4)	72.4 (13.8)*	76.9 (14.3)	74.5 (17.0)	82.5 (17.2)	75.0 (14.4)*
	Transient Violations ¹	22.9 (7.6)	21.8 (6.7)	33.0 (7.1)	22.0 (8.1)	26.4 (9.0)	22.0 (6.8)***
	Fixed Violations ²	10.7 (2.0)	10.4 (0.8)	10.5 (1.2)	10.8 (2.9)	10.9 (1.5)	10.6 (1.9)**
	Misjudgement ²	12.2 (3.0)	12.3 (2.6)	12.3 (2.8)	12.2 (3.2)	12.4 (2.8)	12.2 (2.9)
	Risky Exposure ¹	26.0 (5.0)	22.7 (5.2)***	25.7 (5.2)	24.3 (5.2)*	26.6 (5.6)	25.1 (5.1)*
	Driver Mood ¹	5.4 (2.4)	5.3 (2.2)	5.4 (2.2)	5.2 (2.5)	6.2 (2.4)	5.2 (2.3)**

Note: Significant differences evaluated at the level of .05 have been highlighted in bold for ease of reference. Psychological traits and states were self-reported in Survey 2 (Provisional survey). – = not applicable. * $p < .05$, ** $p < .01$, *** $p < .001$. ¹ Analyses utilised analysis of variance. ² Analyses utilised Kruskal-Wallis tests.

Table 3. Exposure characteristics for a longitudinal sample of young novice drivers in Queensland.

Key Measure	Duration (hrs) M (SD)	Distance (km) M (SD)
<i>Sociodemographics</i>		
Gender ¹		
Male	7.3 (9.8)	190.2 (167.8)
Female	7.4 (8.7)	167.9 (160.7)
Age ¹		
17 years	7.2 (9.4)	173.7 (142.4)*
18 years	8.3 (9.9)	192.9 (181.8)
19 years	5.9 (5.7)	135.0 (169.1)
20 years	8.3 (6.0)	197.0 (190.0)
Australian-born ¹		
Yes	7.6 (9.4)	178.0 (166.0)
No	5.6 (3.6)	144.1 (128.7)
Speak English at home ¹		
Yes	7.5 (9.8)	173.3(165.3)
No	4.5 (2.6)	99.3 (66.2)
Marital Status ¹		
Single	7.3 (9.1)	153.7 (153.5)**
Relationship	7.6 (8.2)	215.0 (173.4)
Education ¹		
≤ Year 12	7.5 (9.4)	165.1 (150.0)
Tertiary	6.8 (6.3)	231.2 (217.5)
Studying ¹		
Yes	7.1 (8.3)	166.7 (151.1)
No	7.7 (10.0)	185.9 (177.9)
Employed ¹		
Yes	7.6 (8.7)*	153.0 (160.3)
No	6.9 (9.9)	182.6 (163.8)
Location ¹		
Urban	7.7 (8.5)*	169.9 (157.2)
Rural	7.0 (9.9)	183.3 (172.5)
<i>Driving Behaviour: Pre-Licence</i>		
Pre-Licence driving ¹		
Yes	9.4 (10.9)	209.3 (160.4)
No	7.1 (8.7)	170.0 (163.0)
<i>Driving Behaviour: Learner Licence</i>		
Practice difficulty ²		
Difficult	7.3 (7.4)	149.6 (148.7)**
Neither	7.7 (11.4)	154.6 (173.6)
Easy	7.1 (8.3)	195.2 (161.2)
Duration ³		
12-14 months	7.7 (9.7)	186.3 (157.6)*
14-24 months	7.3 (8.5)	167.8 (171.2)
>24 months	5.7 (5.7)	125.9 (153.4)
Logbook hours ³		
100-110 hours	7.0 (8.9)	169.1 (160.1)
>110 hours	8.7 (11.5)	195.7 (172.7)
Logbook accuracy ¹		
Accurate	7.3 (8.9)	170.4 (156.5)
Inaccurate	7.9 (9.9)	182.0 (176.6)
Unsupervised Learner ¹		
Yes	7.2 (8.9)	206.2 (151.2)
No	7.4 (9.0)	171.4 (164.0)
Crash ¹		
Yes	11.0 (14.1)	134.6 (144.2)
No	7.3 (8.8)	174.3 (160.8)
Offence ¹		
Yes	5.5 (4.5)	304.2 (153.2)*
No	7.4 (9.1)	170.1 (159.1)
<i>Driving Behaviour: Provisional Licence</i>		
'Talk way out of' ticket ¹		
Yes	7.9 (5.6)	344.3 (225.0)**
No	7.4 (9.2)	166.8 (154.2)
Parent 'took punishment' ¹		
Yes	10.3 (4.6)**	194.4 (114.0)
No	7.3 (9.1)	175.3 (165.5)
Crash ¹		
Yes	8.8 (10.9)	193.2 (165.2)
No	7.2 (8.8)	173.7 (163.6)
Offence ¹		
Yes	11.2 (11.3)***	241.6 (172.3)**
No	16.9 (8.5)	164.6 (156.9)

Note: Significant differences evaluated at the level of .05 have been highlighted in bold for ease of reference. Sociodemographic characteristics were self-reported in Survey 2 (Provisional survey). – = not applicable. * $p < .05$, ** $p < .01$, *** $p < .001$. Analyses utilised Kruskal-Wallis tests.