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2009-003

# Factors influencing learner driver experiences

April 2009



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No. 2009-003**

# **Factors influencing learner driver experiences**

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### Abstract

When compared with more experienced drivers, new drivers have a higher crash risk. This study examined the experiences of learner drivers in Queensland and New South Wales in order to develop an understanding of the factors that influenced them while learning to drive. This will enable the development of more effective licensing systems. The research was informed by a number of theoretical perspectives, particularly social learning theory.

Participants were recruited from driver licensing centres as soon as they passed their practical driving test to attain a provisional licence. Of those approached, 392 new drivers from capital cities and regional locations in Queensland and New South Wales completed a 35 minute telephone interview that collected information on a range of personal, social, environmental and socio-demographic factors. Participants were obtaining their licence before several changes to the licensing systems in both Queensland and New South Wales were made in 2007.

Several implications for countermeasure development resulted from this research. These included ensuring licensing authorities carefully consider mandating a minimum number of hour of practice as it may inadvertently suppress the amount of practice that some learners obtain. Licensing authorities should consider the use of logbooks for learner drivers, even if there is no minimum amount of supervised practice required as it may assist learners and their supervisors structure their practice more effectively. This research also found that the confidence of learner drivers increases between when they first obtain their learner licence and when they obtain their provisional licence. This is an important issue requiring further attention by licensing authorities.

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### Notes

- (1) Department of Infrastructure, Transport, Regional Development and Local Government grant reports are disseminated in the interest of information exchange.
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# EXECUTIVE SUMMARY

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## Background

New drivers of all ages have a higher crash risk than more experienced drivers. However of all new drivers, it is the youngest drivers that have the highest crash risk (Ferguson, Teoh, & McCartt, 2007). One countermeasure that appears to reduce this crash risk is graduated driver licensing which requires new drivers to progress through a number of stages before being granted a full driver's licence (Margolis, Masten, & Foss, 2007). The safest stage in the graduated driver licensing system is the 'learner' phase when new drivers are supervised by a more experienced driver (Williams, Preusser, Ferguson, & Ulmer, 1997).

This study examines learner driver experiences in two Australian states: Queensland and New South Wales. The primary aim of this study was to gain a greater understanding of the factors that influence learner driver experiences. This will enable the development of more effective learner licensing systems throughout Australia. As well as adding to our understanding of the applied aspects of the learner phase, the research develops a theoretical basis to explain how and why this phase is effective. The research uses Akers' Social Learning Theory and sensation seeking to help explain the behaviour of novice drivers.

## Method

This research sought to maximise the participation rates of the learners involved. To do this, participants were recruited from driver licensing centres immediately after passing their practical driving test to obtain the provisional licence. The licensing centres were located in the capital cities of Queensland (Brisbane) and New South Wales (Sydney) as well as in regional locations in each state (Townsville in Queensland and Ballina, Lismore and Newcastle in New South Wales). In order to recruit sufficient participants, the licensing centres were selected based on the relatively large number of practical licensing tests that were processed.

Individuals completed a 35 minute phone interview within a few weeks of recruitment. Participants were offered a movie ticket incentive if they completed the interview. The aim of this incentive was to increase the participation rates and provide some compensation for their time. The total number of people approached was 779 with 687 eligible to participate in the study. Of the eligible potential participants, 494 agreed to participate in the study representing an initial response rate of 71.9 per cent. When the 494 individuals were contacted, 392 participated in the phone interview giving a second response rate of 79.4 per cent. This provided an overall response rate of 57.1 per cent.

The interview collected information on a range of personal, social, environmental and socio-demographic factors. This included questions on gender, age, access to a vehicle, attempts at the learner test, amount of supervised practice, self-reported behaviour and experiences while on a learner licence, sensation-seeking, intentions regarding driving on a provisional licence, perceptions about breaking the road rules, exposure to models and self-reported offence and crash involvement. Additionally, several scales were created to measure the dimensions of Akers' Social Learning Theory.

## Key Findings

The average number of times that learner drivers attempted the learner theory test was 1.84 times ( $sd = 1.8$ ). This varied across the four locations with learners in metropolitan Queensland attempting the test 1.75 times ( $sd = 1.03$ ), regional Queensland 2.11 times ( $sd = .92$ ), metropolitan New South Wales 1.95 times ( $sd = 3.16$ ) and regional New South Wales 1.46 times ( $sd = .88$ ). These differences were not statistically significant.

The findings suggest that requiring learners to complete a set number of hours of supervised practice impacts on the amount of hours that they report completing. Learners in New South Wales generally met the requirement at the time to complete 50 hours of practice. However, it appears that many stopped practising soon after this goal was met. In contrast, learners in Queensland who were not required to complete a specific number of hours at the time of the survey, tended to fall into two groups. The first group appeared to complete the minimum number of hours required to pass the test while the second group completed significantly more practice.

Mandating that learners complete a certain number of hours of practice does not appear to influence their perceptions of how difficult it is to obtain practice. There was no difference in learner perceptions relating to the difficulty of obtaining practice in the four geographic locations studied.

Parents provided the most supervision to learner drivers. Overall, mothers tended to provide more supervision than fathers. Professional driving instructors also provided substantial amounts of supervision. Individuals living in metropolitan Queensland were more likely to have the most lessons with a professional driving instructor. In metropolitan New South Wales, fathers provided the most supervision to learner drivers.

Most participants reported that their parents were helpful and supportive when they were on their learner's licence. Learners reported that most parents do not make it difficult for their children when they are obtaining their required hours of practice. Learners in Queensland were more likely than those in New South Wales to state their professional driving instructor was the person who provided them with the most lessons and practice, possibly reflecting the lack of a set number of required hours on a learner licence at the time of this survey in Queensland.

The average number of vehicles available for learners to use within their households for practice was 2.12 ( $sd = 1.27$ ). Learners in New South Wales were more likely than those in Queensland to obtain most of their supervised driving experience in an automatic vehicle and obtain an automatic provisional licence. In contrast, the majority of Queensland learner drivers obtained supervised driving experience in manual cars and obtained manual provisional licences. Gender, parental income, father's education and the state of residence predicted the type of provisional licence that learners would obtain. More specifically, males, those whose parents had an income greater than \$50,000 per annum, those whose father had completed some post high school education and those living in Queensland were more likely to obtain a manual rather than an automatic licence.

Learner drivers in New South Wales were more likely than learner drivers in Queensland to display L plates and to complete a log book of their hours of practice. This most likely reflects the fact that completion of a log book of practice was a compulsory requirement within New South Wales but not in Queensland at the time of the study. The age of the learner, the state that they lived in as well as whether or not they had practised their driving unsupervised impacted on the frequency with which they displayed L plates. The lack of completion of a log book by Queensland drivers may be partially explained by its voluntary nature. Over two-thirds of Queensland drivers were unaware that Queensland had a voluntary log book.

Almost half of the sample reported that they drove to or from activities that they would have attended anyway. They also drove their parents or their siblings and friends to and from activities, although they did this less frequently. Almost half of the sample made trips for the purpose of

practising three to eight times a month. Nearly 40 per cent of the sample deliberately practised their driving at night. Age predicted the frequency with which learners drove to and from activities that they would have attended anyway as well as the frequency with which they deliberately practised their driving at night or with passengers. Whether the learner was employed full time or part time also impacted on whether they drove to and from activities that they would have attended anyway. Learners were more likely to deliberately practise their driving on weekdays rather than weekends. It appears that learner drivers in metropolitan Queensland are less likely than learners in the other locations to deliberately structure their learning.

Learner drivers in both Queensland and New South Wales reported generally adhering to the road laws. This includes not speeding in 60 kilometres per hour and 100 kilometres per hour speed zones, wearing a seat belt and not driving under the influence of alcohol or legal or illegal drugs. They were unlikely to report that they had been caught breaking the road rules while on their learner licence. Drivers in both states tended to indicate that they planned to obey the road laws once they obtained their provisional licence. However, they reported being less likely to comply with recommended actions to reduce crash risk such as limiting their driving at night. There were no differences across the geographic locations in relation to the intentions of the participants concerning their future driving on their provisional licence.

Nearly 15 per cent of the sample reported that they had driven without a supervisor while on their learner licence for an average of 37.8 minutes ( $sd = 2.79$  hours). None of the socio-demographic factors measured in this study predicted the hours of unsupervised practice that learners reported, indicating that other, unaccounted for, factors influenced this behaviour.

Very few participants participated in formal driver education and training programs. Of those who did participate in this type of course, over half were from the Sydney region, probably reflecting the wider availability of such programs in Sydney.

The average number of attempts made by learner drivers to pass the practical driving test to obtain their provisional licence was 1.5 ( $sd = 0.8$ ). Gender was the only socio-demographic variable that predicted the number of attempts that learners made to pass this test with males more likely to pass on the first attempt.

The use of Akers' Social Learning Theory and sensation seeking proved effective in predicting aspects of learner driver compliance to the law. Socio-demographic variables, Akers' Social Learning Theory and sensation seeking predicted approximately 37 per cent of the variance in learner driver compliance with the law. Gender was the main statistically significant socio-demographic predictor. Within Akers' Social Learning Theory, the behaviour of friends, personal attitudes and rewards were significant predictors. Sensation seeking was also a significant predictor of learner driver compliance with the law.

These theoretical perspectives also proved effective in explaining the future driving intentions of the learner drivers accounting for approximately 49 per cent of the variance in intentions. While none of the socio-demographic variables were significant predictors, a number of the variables from Akers' Social Learning Theory were significant predictors including anticipated rewards. Sensation seeking was also a significant predictor.

## Implications

This study has a number of implications for countermeasure development, particularly in relation to mandating supervised practice, the use of log books and reducing perceptions of risk. The results suggest that licensing authorities need to carefully consider the amount of supervised practice that they mandate for learner drivers. This is because, at least based on the 50 hours requirement in New South Wales at the time, it appears that it may inadvertently suppress the amount of practice gained

by one segment of learner drivers. However, mandating a set number of hours does ensure that the majority of individuals obtain a minimum level of driving experience. If authorities mandate a larger amount of supervised hours, they may also need to consider increasing the length of the learner licence period to allow learners sufficient time to obtain the necessary practice. In this regard it is noted that, with recent changes to the licensing system in Queensland, there is now a requirement to complete 100 hours of supervised practice and learners are able to obtain their learner licence at 16 years before obtaining a provisional licence at 17 years.

Licensing authorities should also consider the use of compulsory logbooks, even if they do not mandate a set number of hours of practice. This may help learners and their supervisors to structure their practice more effectively. A logbook could also facilitate communication between learner drivers and their supervisors. The logbook would need to be compulsory as this research demonstrated that in situations where it is voluntary, two-thirds of learners are unaware of the logbook's existence. Completion of a logbook is now a compulsory requirement in Queensland as well as New South Wales.

The confidence of learner drivers increases from when they first obtain their learner licence to when they obtain their provisional licence. Although this issue is more relevant for provisional drivers, policy makers need to ensure that they engage with learners and their parents to develop strategies to manage this reduction in perceived risk.

Further research is needed to complement this study. This research focussed on learner drivers which is one of three stages within a graduated driver licensing system. Further research should focus on the role of the provisional licensing stage. Several of the elements present in the provisional licence systems of other countries, such as night driving or peer passenger restrictions, are not currently present in the same form in Australia which tends to use combined night driving and passenger restrictions. Alternatively, Australian jurisdictions apply the restriction as a penalty after the provisional driver has lost their licence. Further research will provide a greater understanding of how effective the provisional licence is as part of a graduated driver licensing system.

Future research should also examine the learner licence stage from the viewpoint of parents. This study has highlighted the role that parents play in the supervision of the learners, particularly given that mothers and fathers provide the most opportunities for practice. It would be useful to understand what facilitates and inhibits parental involvement in the learning to drive process.

Graduated licensing systems constantly evolve and change. Queensland and New South Wales are in the process of making changes to their learner licence including requiring 100 hours of supervised practice in Queensland and 120 hours of supervised practice in New South Wales. These changes should be evaluated in order to assess their effectiveness. In this regard, this research provides valuable benchmark data for evaluating these changes. This research has also shown the usefulness of theoretical perspectives such as Akers' Social Learning Theory and sensation seeking in predicting the behaviour of learner drivers. Further research will help to identify if these theories predict the behaviour of novice drivers in other licensing stages such as the provisional licence stage.

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# 1 INTRODUCTION

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## 1.1 THE LEARNER PHASE

Young, newly licensed drivers have the highest crash risk of all drivers (Williams, 2003) with the main countermeasures used to reduce this crash risk being driver education and training as well as graduated driver licensing (GDL). However, driver education and training has been criticised because it appears to have limited capacity to reduce crashes (Hatakka, Keskinen, Gregersen, Glad, & Hernetkoski, 2002). In contrast, GDL appears to have been more successful in reducing crash risk for novice drivers (Simpson, 2003).

GDL is a system designed to reduce crashes for newly licensed drivers by better managing their exposure to risky driving situations during the time they are acquiring their experiences as drivers (Williams, 2007). Although newly licensed drivers have the highest crash risk of all drivers, this appears to commence when these drivers start driving by themselves (Preusser & Tison, 2007). Prior to this, when supervised by a more experienced driver in the learner licence phase, the crash risk is low (Cavallo, 2006; Queensland Transport, 2005; Williams et al., 1997). This highlights the importance of ensuring that the benefits of the learner period are maximised.

## 1.2 RATIONALE FOR THE STUDY

GDL systems exist in numerous jurisdictions within the United States of America, Canada, New Zealand and Australia. Evaluations of these systems suggest that they reduce crashes with the effectiveness of certain elements such as extended learner periods as well as night time and passenger restrictions supported by research (Williams, 2007). However, much of this research has taken place in North America (Williams, 2007) and New Zealand (Begg & Stephenson, 2003). Additionally, research in this field tends to be data-driven (Elvik, 2004) and lacks a strong theoretical foundation to explain driver behaviour, influences on the acquirement of driver experience and related patterns of driver exposure.

As a result there is a need for further research into the experiences of learner drivers within Australian licensing systems. Although each Australian state and territory has its own driver licensing system, this study examines the learner licensing system in two states: Queensland and New South Wales. These states were chosen as they represented, at the time of the study, a more traditional and a more advanced learner phase. Learners in New South Wales were subject to a more rigorous driver licensing process at the time of this study.

This study uses cross-sectional data that is intended to be more representative of the population of learner drivers by maximising the participation rate. This research also uses a theoretical base to explain the behaviour of learner drivers in order to develop a deeper understanding of why the learner phase has a lower risk for new drivers.

## 1.3 OBJECTIVES OF THE STUDY

The objectives of this study are:

- Examine the self-reported experiences of learner drivers in two Australian states: Queensland and New South Wales;

- Investigate whether there are differences between learner driver experiences based on the licensing system that they were exposed to;
- Examine the personal, social, environmental and socio-demographic factors that impact on the learner licence phase using relevant theoretical perspectives including Akers' Social Learning Theory and sensation seeking; and
- Identify potential improvements to current countermeasures and new initiatives that will reduce novice driver crashes.

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## **2 LITERATURE REVIEW**

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### **2.1 Novice driver crash risk**

The group with the highest crash risk is young, newly licensed drivers. These individuals experience the highest crash risk immediately after gaining a driver's licence that allows unsupervised driving. This risk falls rapidly during the next few months and then falls more slowly for the next 18 months (Williams, 2003). The crash risk of young, newly licensed drivers appears to result from a combination of both age factors and lack of driving experience (Williams, 2006). Young drivers are more likely to take risks by engaging in a range of risky driving behaviours such as speeding and following vehicles too closely that increases their risk of crashing (Jonah, 1986). Newly licensed drivers are exposed to risk because of their lack of experience. These risks include driving at times that research indicates are more dangerous such as late at night and with young passengers in their vehicle (Williams, 2003).

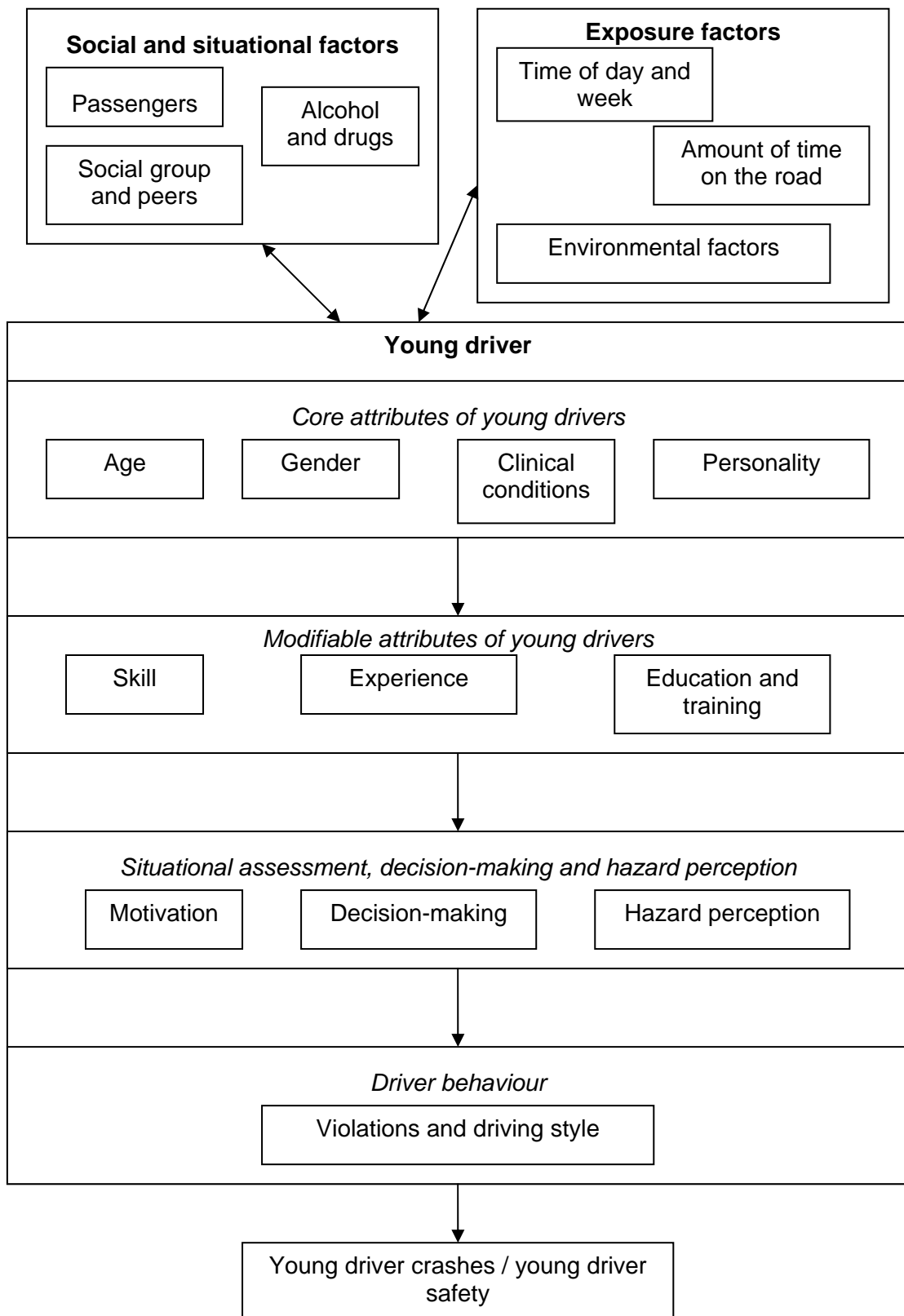
In contrast, research examining the fatal crashes of 15 year olds in North America found that learners driving under supervision and in accordance with the conditions of their licence had comparatively few crashes. Those learners that did crash generally did so while unlicensed or in violation of the conditions of their licence (Williams et al., 1997). Crash data from Queensland and Victoria confirms that the learner licence stage is the safest for new drivers (Cavallo, 2006; Queensland Transport, 2005).

### **2.2 Factors influencing novice driver behaviour**

The crash risk of young novice drivers is affected by a number of factors. These factors include social and situational influences, exposure-related influences and the characteristics of young drivers. Among the young driver characteristics influencing crash risk, there are several further factors including core attributes, modifiable attributes, situational assessment and decision-making skills as well as driver behaviour (Williamson, 1999). Figure 1 shows how these factors interrelate.



**Figure 1: Factors relating to young driver safety**



Source: (Williamson, 1999)

### 2.2.1 Social and situational factors

As depicted in Figure 1, social and situational factors such as passengers, alcohol, social group and peers affect the crash risk of novice drivers (Williamson, 1999).

#### ***Passengers***

Research has identified that the presence of peer group passengers increases crash risk for young drivers. Young drivers aged between 16 and 19 were more likely to experience a fatal crash if they carried one or more passengers. The more passengers that were carried in a vehicle, the higher the crash risk (Chen, 1999).

Research undertaken in the United States of America examined whether drivers travelling with passengers had a higher crash risk when the distance travelled was held constant (Preusser, Ferguson, & Williams, 1998). The results indicated that passengers may distract young drivers leading to errors and an increase in crash risk (Preusser et al., 1998). The researchers did not have access to actual exposure data and therefore estimated exposure using a statistical technique. The reliability of this estimated exposure will affect the reliability of the study's results. However these results, indicating an increase in crash risk for young drivers with passengers present, are consistent with studies conducted by other researchers (Begg, Stephenson, Alsop, & Langley, 2001; Lam, Norton, Woodward, Connor, & Ameratunga, 2003).

Another explanation for the higher crash risk for young drivers when transporting passengers is that passengers may encourage drivers to conform to the prevailing norms of their social group (Baxter et al., 1990). A driver may choose to drive in a risky manner on a given occasion. However, the support of passengers will encourage this behaviour to continue.

The gender of the passengers also affects the driver's likelihood of crashing. Drivers with only male passengers were more likely to crash when compared with drivers who only had female passengers. Driver deaths per 1,000 crashes increased more than twice when there were two or more male passengers. Driver deaths per 1,000 crashes doubled if there was a combination of male and female passengers. Although female passengers also increased crash risk they did so at a much lower rate (Chen, 1999).

#### ***Alcohol and drugs***

Alcohol increases crash risk for all drivers including young drivers (Begg, Langley, & Stephenson, 2003). Young drivers appear to drink less than older drivers and drink drive on fewer occasions but are more likely to crash when they do drink (Williams, 2003). However, drink driving may be limited to particular groups of young drivers (Morrison, Begg, & Langley, 2002). These groups include those dependent on alcohol and cannabis, males, those from lower socioeconomic backgrounds, individuals with lower educational attainment and unmarried people (Morrison et al., 2002). This study used an existing cohort, that was originally recruited for other longitudinal research, as its sample. The cohort is not a random sample from the population and, therefore, the results cannot be generalised to the remainder of the community. The study's design means that incidents where the young person was the driver, rather than the passenger, were more likely to be reported. The researchers used self-report to identify if the person drove after drinking or while sober. Using self-report to identify the level of drink driving means the reliability of the data is unclear.

Recent research suggests that adolescents are more likely to drive under the influence of cannabis than drive under the influence of alcohol even though more young people drink alcohol than smoke cannabis (Asbridge, Poulin, & Donato, 2005). The risk of crashing doubled for those who had

smoked cannabis recently (Asbridge et al., 2005).

### ***Social group and peers***

A young driver's social group may affect their driving by encouraging them to take greater risks (Williamson, 1999). Peers can affect a driver's behaviour both directly and intentionally as well as indirectly and inadvertently. Peers could directly encourage drivers to engage in risky behaviours such as speeding (Simons-Morton, Lerner, & Singer, 2005). If a driver believed that their peers thought that driving in a certain way was expected, they may be more inclined to drive that way.

## **2.2.2 Exposure factors**

Exposure factors refer to the fact that a driver's pattern of road use affects their risk of being involved in a crash. The amount of time on the road, the time of day and week and environmental factors affect crash risk (Williamson, 1999).

### ***Amount of time on the road***

As described earlier, young drivers have a higher crash risk than other age groups after controlling for their greater exposure (Wylie, 1996). However, young drivers who spend less time on the road also have a higher risk of crashing when compared with more experienced young drivers (Williamson, 1999).

### ***Time of day and week***

Young drivers are more likely to crash at night and over the weekend (Williams, 2003). Although older drivers also have an increased crash risk at these times, the crash risk for younger drivers increases at a disproportionate rate (Williamson, 1999). A summary of studies evaluating night driving restrictions and graduated licensing systems that include a night driving restriction concluded that limiting driving at night reduced both the number and rate of crash involvement at this time for young novice drivers (Lin & Fearn, 2003). As such, night driving restrictions appear to effectively limit the exposure of new drivers to more dangerous driving situations.

### ***Environmental factors***

The influence of environmental factors is less well known with minimal empirical research conducted in this area. Some researchers assert that rural roads (Williamson, 1999), licensing laws and the enforcement of licensing laws are environmental factors (Chen, 1999). However, individual factors appear to mediate environmental factors.

## **2.2.3 Young driver factors**

As depicted in Figure 1, there are four categories of young driver factors that are relevant for explaining their heightened crash risk: core attributes, modifiable attributes, situation assessment and decision-making characteristics as well as the types of behaviour the young driver engages in (Williamson, 1999).

### **Core attributes**

The core attributes of the young driver are relatively fixed or enduring and, hence, unlikely to change because of outside influences (Williamson, 1999). Core attributes include age, gender, personality and clinical conditions.

As outlined in the crash figures earlier, younger drivers have higher crash risks than older drivers. Research has shown that the youngest group of drivers have the highest risk (McKnight & McKnight, 2003). Younger drivers have a higher crash risk due to a lack of experience and a propensity to drive in high-risk situations (Wylie, 1996). They also lack driving skill, are immature, lack risk perception abilities and overestimate their driving skills (Masten & Hagge, 2004).

The crash risks, particularly in the case of driver fatalities, for young male drivers are higher than for young female drivers (Dejoy, 1992). A study in Jordan identified that male drivers travelled more kilometres per year than female drivers (Al-Balbissi, 2003). The same study identified that males of all ages had higher crash rates than females. However, this difference was greatest among the 18 to 25 years age group (Al-Balbissi, 2003). The gender differences contributing to crash risk appear to be decreasing (Williamson, 1999). For instance, there is no indication that gender moderates the relationship between risky driving and sensation seeking (Jonah, Thiessen, & Au-Yeung, 2001).

Personality factors, such as sensation seeking, aggressiveness and egocentrism also affect young driver crash risk (Williamson, 1999). Sensation seeking is the willingness to take physical and social risks to fulfil a need for varied, novel and complex sensations (Arnett, Offer, & Fine, 1997). Adolescents aged 16 to 19 years have the highest rates of sensation seeking (Williamson, 1999). Sensation seeking has been linked to risky driving behaviours including speeding, drink driving and following too closely (Arnett, 1990; Jonah, 1997; Jonah et al., 2001).

Individuals with higher levels of aggression also tend to drive more recklessly (Arnett et al., 1997). The researchers identified this by surveying a group of students in the senior grade and asking volunteers to keep a log of their driving-related behaviour. This study has several limitations apart from the non-random sample. The sample was based on one group of 17 to 18 year olds, thus limiting the conclusions that can be drawn from the study. The data was also collected using self-report methods.

Egocentrism is the tendency of people to view the world in relation to themselves (Williamson, 1999). Young drink-driving males are more likely to have higher levels of egocentrism.

A small group of younger drivers affected by clinical conditions may also have higher crash risks (Williamson, 1999). Research suggests that several conditions can increase a driver's crash risk. These include stroke, myocardial infarction and underlying cardiovascular disease, affective or psychological disorders including anxiety, depression and related conditions, sleep disturbances and visual deficiencies (Sagberg, 2006). The presence of some conditions such as diabetes or depression may decrease the amount of driving that older men undertake (Parmentier et al., 2005). This may also apply to younger drivers.

Conditions such as Attention Deficit Hyperactivity Disorder (ADHD) impact on young drivers' behaviour and crash risk (Watson & Mihovilovich, 1999). For example, young drivers with ADHD are more likely to speed and have a higher risk of injury (Barkley, Murphy, & Kwasnik, 1996). They are also more likely to crash. The effect of ADHD on driving errors and crashes is likely to decrease as individuals' age. As ADHD sufferers age they are likely to develop more effective coping strategies that enable them to decrease their risk (Reimer et al., 2005).

### ***Modifiable attributes***

The modifiable attributes of young drivers include skill and experience as well as the level of education and training received. Moreover, the amount of education and training received will in turn affect the young driver's level of skill and experience (Williamson, 1999).

Driving skill relates to the ability to operate a vehicle in traffic and reflects both cognitive and psychomotor abilities (Williamson, 1999). Young drivers need to develop the ability to operate a motor vehicle with minimal cognitive resources. This allows them to 'free up' cognitive space to concentrate on other aspects of driving such as negotiating traffic (McDonald, 1994). Individuals still developing their cognitive driving skills tend to be overly reliant on formal rules or laws, which can contribute to them failing to anticipate the mistakes of other road users.

However, it takes more than skill to drive safely. Young people must be able to apply their skill and make judgements about this application (Williamson, 1999). Driver training tends to focus on the development of driving skills and involves the learning of specific methods and techniques of driving and operating a vehicle. In contrast, driver education programs tend to focus on teaching young drivers how to apply their skill (see section 2.3.1) (Langford, 2002).

Obtaining on-road experience is an important factor in reducing crashes. However, age and experience (the obtaining of skill over time) are highly correlated, making it difficult to identify if one is more important than the other in predicting crash risk (McKnight & McKnight, 2003). Swedish research identified that lowering the age to obtain a learner licence and increasing the amount of supervised driving practice prior to obtaining a driver's licence reduced crash risk by approximately 40 per cent once solo driving commenced (Gregersen et al., 2000). This research evaluated the introduction of a nation-wide initiative. For this reason, the study may be confounded by factors such as age, socio-demographic variables and general crash rates. However, the study design attempted to estimate the effects of these factors.

### ***Situational assessment, decision-making and hazard perception***

A young driver's skill in assessing the road environment and their motivations play a role in determining their behaviour and related crash risk. The ability to assess traffic situations is known as hazard perception. This skill is important in reducing crash risk and may be one reason for the difference in crash risk between novice and experienced drivers (Sagberg & Bjornskau, 2006). Novice drivers tend to focus on the lane and road markings close to their car. Experienced drivers look at the horizon and use their peripheral vision to maintain their lane position (Leung & Starmer, 2005).

External, social factors such as tolerance of breaking the road rules also affect decision-making (Williamson, 1999). These factors are more likely to affect younger drivers than older drivers (Delhomme & Meyer, 1998). Younger drivers tend to drive safely because of a sense of obligation to obey the law while older drivers consider the negative outcomes if they did not comply. However, younger drivers display more tolerance of those who commit violations. Compared with older drivers, younger drivers believe more people commit violations (Yagil, 1998). The ability to draw conclusions from this research is limited by the fact that all respondents were male members of the Israeli army. However, all Israeli men must serve in the army. Therefore, conclusions regarding other males in Israel should be possible.

An individual's capacity to make decisions while driving also affects crash risk. Both internal and external factors affect the driver's ability to make decisions. Drivers with higher skill development have more cognitive capacity to make decisions. For instance, as the driving task becomes more automated, more cognitive capacity becomes available allowing the driver to make more effective

decisions (Sagberg & Bjornskau, 2006).

Young drivers, particularly young males, are also more likely to have higher levels of confidence regarding their driving ability than older drivers (Dejoy, 1992). They are also more likely to underestimate the risks involved with driving (McKnight & McKnight, 2003). These factors combined increase crash risk for young drivers (McDonald, 1994).

### ***Driver behaviour***

The final characteristic of young drivers that increases their crash risk is their driving behaviour. How drivers behave on the road, including their violations of road rules, increases their crash risk (Williamson, 1999). Young drivers are more likely to exceed the speed limit, travel too close to the vehicle in front and provide poor signals (Baxter et al., 1990). This research used observational processes and did not link individual drivers with crashes. Additionally, the sampling did not appear to be random. This may limit the applicability of these results.

However, the fact that young drivers are more likely to exceed the speed limit is supported by Australian research. An Australian study examining community attitudes to road safety found that 15 per cent of those aged 15 to 24 always or almost always drove 10 kilometres per hour above the speed limit. Fourteen per cent of the sample within this age group stated that their driving speed had increased over the past two years while 12 per cent advised that their driving speed had decreased over the same period (Pennay, 2006).

Driving violations, rather than driving errors, are a significant factor in crashes for this age group (Parker, Reason, Manstead, & Stradling, 1995). Recent research suggests that there is a relationship between parents' driving behaviour and that of their children. This relationship primarily applied to dangerous driving behaviours. The more driving violations parents committed, the more their children committed (Bianchi & Summala, 2004).

## **2.3 Countermeasures**

The most widely implemented countermeasures to reduce the crash risk specifically among novice drivers are driver education and training as well as GDL. Both countermeasures aim to provide new drivers with the skills, knowledge and attitudes that are required for safe driving (Mayhew, 2007).

### **2.3.1 Driver education and training**

Many individuals and groups use the terms driver education and driver training interchangeably, however, there are theoretical distinctions between them (Watson et al., 1996). The focus of driver training tends to be on car control skills and ensuring that drivers possess the ability to handle a vehicle. Driver education may involve training, but the focus is broader. Education covers all elements required to drive a vehicle (Langford, 2002). The purpose of driver education includes teaching young drivers the skills and attitudes required to become safe and responsible drivers (Zhao et al., 2006).

Policy makers, the media and the public frequently view driver education and training as a measure that will reduce novice driver crashes (Mayhew, 2007). There is a belief that the provision of information will help the community to stay safe (Christie, 2001) and that this is a sensible alternative to allowing new drivers to learn by 'trial and error' (Mayhew, 2007).

Traditional driver training and education has focused on car-control skills. The available evidence suggests that training that develops a driver's skill level can lead to overconfidence, risk taking and, as a result, higher crash rates (Christie, 2001). In contrast, training that concentrates on higher level skills such as hazard perception and risk assessment may help to reduce crash risk but further evaluation is required to confirm this (Christie, 2001).

A common criticism of driver education is its limited capacity to reduce crashes (Hatakka et al., 2002). Reviews of evaluations of traditional driver education have failed to consistently link this countermeasure with crash reduction (Mayhew, 2007). There is no Australian or international evidence confirming that one method of pre-licence driver training is more effective at reducing novice driver crash rates than another (Watson et al., 1996). In many cases, the safety messages provided in these generally short courses is probably overwhelmed by the other pressures that shape the novice driver's behaviour such as parental, peer and other social influences (Williams, 2006).

Early evaluations of training and education indicated that it reduced the crash risk for those who participated in the programs. However, many of these studies had methodological flaws that limited confidence in the results (Zhao et al., 2006). These methodological flaws generally related to self-selection (Mayhew, 2007). More recent studies have indicated that traditional driver training has failed to reduce road crashes (Mayhew & Simpson, 2002). For example, the introduction of skid training for novice drivers, a type of driver training designed to help manage skids on slippery roads has been shown to lead to an increase in the number of crashes amongst participants (Katila, Keskinen, Hatakka, & Laapotti, 2004).

The largest experimental study of driver education and training provided in secondary schools conducted to date is the DeKalb County study (Young, 2002). The study aimed to identify the effect of driver education and training on crashes and offences. In this study 16,338 drivers were randomly assigned to one of three groups. The first group received the Safe Performance Curriculum (SPC). This curriculum provided the most advanced education and training in the United States of America at the time. The second group was provided the Pre-Driver Licensing Curriculum (PDL). This curriculum taught the minimum skills required to pass the driving test. The final group was a control group. This group did not receive any driver education through the school (Lund, Williams, & Zador, 1986).

The original study did not identify any significant differences between the three groups regarding crash rates or traffic offences (Lund et al., 1986). The data did demonstrate a short term benefit. The two groups that received driver education demonstrated better driving skills and lower crash rates than those in the control group for the first six months of driving. However, this analysis only used data from the drivers who received their licence.

Subsequent analysis revealed that those students who were assigned to the SPC group received their licence earlier, and had higher crash rates and traffic offences than those students in the control group (Lund et al., 1986). Those students in the PDL group were also more likely to receive their licence earlier than the control group. However, there was no difference in crash rates or traffic offences. This data may indicate that the provision of driver education and training in schools leads to earlier licensing and, as a result, increases the exposure of new drivers to crash risk.

Researchers believe that driver education and training that addresses higher-order skills may be more successful if combined with a GDL system (Mayhew & Simpson, 2002). The GDL system could be designed to encourage the use of particular forms of driver education and training (Bates, Watson, & King, 2006). This type of collaboration may fit with the extended learning that the GDL is intended to provide.

### 2.3.2 Graduated driver licensing

The philosophy of GDL systems distinguishes them from other licensing systems. GDL systems use a public health approach to reduce crash risk by focusing on reducing risk for new drivers as a group rather than the risk of individual drivers (Foss, 2007).

The purpose of GDL is to gradually introduce new drivers to more complex driving environments as they gain experience (Simpson, 2003). The aim is to minimise the exposure of novice drivers to risky situations, while allowing them to obtain experience as drivers (Waller, 2003). Typically, there are three stages in a GDL system – learner phase, intermediate stage (also known as a provisional licence in Australia) and full licence (Williams & Mayhew, 2003). As new drivers demonstrate their experience in less demanding stages, restrictions are lifted and new driving privileges introduced (Robertson & Finnegan, 2003).

The learner phase allows the new driver to develop driving skills under the supervision of a more experienced driver (Mayhew, 2003); while an intermediate licence allows solo driving subject to restrictions (Preusser & Leaf, 2003). Examples of these restrictions include limits on night time driving and on the number of peer passengers (Lin & Fearn, 2003). Many jurisdictions, particularly in North America, are beginning to implement some of the elements of the system (Williams & Mayhew, 2003). However, licensing systems evolve constantly with new elements added and others removed.

The evidence suggests that an effective GDL system will contain a minimum six month learner phase, a night time and/or a passenger restriction and will not issue an open licence before the age of 17 (Williams & Mayhew, 2003). A GDL is not designed to reduce deliberate risk taking by new drivers. Instead, it reduces crash risk caused by inexperience (Waller, 2003).

New Zealand introduced the first GDL in 1987. Since then their popularity has grown, with jurisdictions within Australia, New Zealand, the United States of America and Canada introducing forms of GDL (Simpson, 2003). An increasing number of evaluations of GDL systems indicate that this countermeasure is effective in reducing crash risk. In the United States of America, the introduction of GDL systems has reduced the crash risk of the youngest newly licensed drivers by 20 per cent to 40 per cent (Shope, 2007). This variance may result from different research methodologies as well as different licensing programs.

Evaluations of the New Zealand GDL system that occurred immediately after its introduction demonstrated a reduction in casualty crashes of 25 per cent. However, longer-term studies are demonstrating a sustained reduction of around seven per cent (Simpson, 2003). One evaluation of the New Zealand system linked crash records to hospital data. The linkage helped to ensure that the crash records were unbiased (Begg & Stephenson, 2003). Nearly 5,000 cases were included in the analyses. Each case was a crash between 1980 and 1995 that involved a driver aged 15 to 19 years where the hospital and crash records were linked. The licence status of the driver had to be known (Begg & Stephenson, 2003). The researchers used a regression model to identify the effects of the GDL on crashes that involved night time driving, alcohol or passengers of all ages. The study identified a reduction in crashes that involved each of the factors mentioned above during the provisional licence stage. However, after full licensure there was only a reduction in night time crashes (Begg & Stephenson, 2003). One weakness of this study was its inability to identify the age of passengers. This information was not recorded by the hospitals unless the passenger was injured (Begg & Stephenson, 2003).

There are limited evaluations of GDL systems within Australia. For some time however, most of the systems have had learner, provisional and open licence phases but have not incorporated late night driving or passenger restrictions. However, during 2007 a number of jurisdictions introduced more comprehensive restrictions such as limits on the number of peer passengers at night which



were introduced in both Queensland and New South Wales (Senserrick, 2007).

While research has confirmed the effectiveness of GDL systems, there is limited evidence available regarding the mechanisms by which they successfully reduce crashes and which particular components are most effective (Shope, 2007). Research supports the benefits of extended learning periods, night time restrictions and passenger restrictions in reducing crash risks while the evidence is uncertain regarding mobile phone usage or requiring new drivers to be penalty free before advancing through the system (Williams, 2007).

To date, no theory has been applied to explore how these systems influence driver behaviour relative to other influences on novice driver behaviour. Apart from identifying why or how GDL works, we also lack information regarding whether GDL improves driving skills or simply manages risky exposure while novice drivers mature (Simpson, 2003). Other questions include whether GDL is most effective for young novices or for all new drivers, identifying the features that contribute most to crash reduction (learner phase or provisional phase) as well as continuing to develop our knowledge regarding which restrictions are the most effective (Simpson, 2003).

## **2.4 The learner phase**

The learner phase is designed to allow new drivers the opportunity to gain practical driving experience with vehicle handling, the road environment and with the behaviour of other drivers (Foss, 2007). This phase recognises that individuals need to learn how to drive and to accumulate their initial driving experience in lower risk situations (Mayhew, 2003). While the learner phase is critical in a comprehensive GDL, it is important to note that supervised driving is inherently different from unsupervised driving (Foss, 2007). Benefits from the learner phase may result from delayed licensure, the supervised learning process, mandated hours of practice and the involvement of parents.

### **2.4.1 Delayed licensing**

Delayed licensing occurs when learner drivers are delayed from obtaining the ability to drive without supervision for a time. It limits learners' exposure to risky driving situations and allows them time to mature thereby reducing crashes (Simons-Morton, 2007). Some authors prefer to use terms such as 'altered' licensing rather than delayed licensing as it suggests that the GDL system has been amended with the goal of providing learner drivers the opportunity to participate in less risky driving situations rather than amended to keep new drivers off the road (Foss, 2007).

Delayed licensing can result from increasing the amount of time that must be spent as a learner or raising the minimum age to obtain a learner licence (Williams, 2007). Jurisdictions that allow learners to obtain their licences from a relatively young age promote early learning that generally results in earlier licensure (Preusser & Tison, 2007).

Another factor that impacts on when individuals obtain a licence that allows them to drive unsupervised is the length of time that the learner licence is valid (Preusser & Tison, 2007). Learner licences that expire in a relatively short time period may encourage individuals to become licensed near the expiration date due to the sense of urgency that the short time frame creates. Allowing learners to drive on a licence that does not expire for a significant time period does not create this pressure (Preusser & Tison, 2007).

An analysis of fatal crash rates for 15, 16 and 17 year olds between 2003 and 2005 in the United States of America found that those licensed in states with the most restrictive learner laws (did not allow learning until age 16 with licensing at age 16 ½ or older) had the lowest fatal crashes per

10,000 persons aged 15 to 17 (3.25). Crash rates increased to 3.76 for states with moderate restrictions (allowed learning to commence prior to 16 and licensed from age 16 to 16 ½). The highest crash rates (7.07) were for licensing systems that commenced learning from the age of 14 and allowed solo driving prior to 16 years (Preusser & Tison, 2007). This suggests that those jurisdictions that allow individuals to learn at an earlier age and those that allow individuals to become licensed at an earlier age have higher crash rates.

#### **2.4.2 Supervised learning**

Basic vehicle control skills can be taught to new drivers within a few hours (Lund et al., 1986) but the higher order skills such as perception, attention and judgement develop over several years. The amount of practice required for driving to become a more automated task is not known (Simons-Morton, 2007). Although new drivers' ability improves over time, it does not equal the ability of more experienced drivers in more complex driving situations.

The amount of practice undertaken by learner drivers may be affected by a number of factors including increasing self-confidence as vehicle control skills improve, time issues as participation in competing activities such as part-time work and social events increases, and pressures resulting from completing secondary school at the same time as holding a learner's licence (Harrison, 2004). Research conducted with a sample of learner drivers in Victoria, Australia found that this group accrued an average of 20.8 hours of supervised practice over a two year period. Within this practice, the learners failed to gain much experience in potentially higher-risk situations such as driving in the rain or at night. However, participants quickly became confident of their driving abilities. The applicability of this research may be limited as participants were recruited from schools resulting in a sample that may be younger than the wider population of learner drivers. The voluntary basis of participation may mean that the participants were more motivated than other learner drivers (Harrison, 2004).

In some United States jurisdictions, driver education is used as a substitute for supervised practice. However, this appears to result in fewer hours of practice overall (Mayhew, 2007). This could occur because parents with fewer skills deliberately encourage their children to undertake driver education rather than teach them or it may lead to parents having overconfidence in their children's ability to drive (Mayhew, 2007).

#### **2.4.3 Mandated hours of practice**

Some jurisdictions require learners to obtain and record in a logbook a fixed number of driving hours. These requirements in the United States of America vary from 20 to 50 hours, although there appears to be little research basis for the selection of particular time limits (Foss, 2007). There is some research support for learners obtaining close to 120 hours of practice. Evidence from Swedish research suggests that supervised learning reduced post-licence crash rates for learners who had 118 hours practice (Gregersen et al., 2000). This amount of practice dramatically exceeds the required practice requirements in United States jurisdictions.

The Swedish study evaluated the effects of a licensing reform that lowered the age limit for learning to drive from 17 ½ years to 16 years while maintaining the licensing age for solo driving at 18. This provided learner drivers more opportunities to practice (Gregersen et al., 2000). Those who commenced learning to drive at 16 years had an average of 118 hours of supervised practice. Those who started learning to drive at 17 ½ years prior to the introduction of the change practised for an average of 47 hours. Those who started to learn at 17 ½ years after the introduction of the change practised for approximately 41 hours (Gregersen, 1997). This licensing system change resulted in a reduction in crash risk of approximately 15 per cent during the following two years. When

compared to the period before the change, those who used the early practice period had their crash risk reduced by approximately 40 per cent (Gregersen et al., 2000).

As mentioned above, the level of supervised driving in Australia appears very low with a sample of Victorian learners accruing an average of 20.8 hours over 24 months (Harrison, 2004). This sample consisted of 130 participants recruited from government, Catholic and independent schools. Participants completed a logbook of their driving experiences which was returned to the researcher at the end of each month.

There may be drawbacks to requiring learners to complete a mandated number of hours while on their learner licence. The mandated number of hours, for instance 50 hours, may imply to learners and their parents that 50 hours is all the time it takes to learn the many skills required to learn to drive (Foss, 2007). It may also imply that learning to drive is a simple task that is 'finished' as soon as the learner requirements are fulfilled (Foss, 2007). However, requiring new drivers to complete a certain amount of practice may also delay licensing and thus reduce their exposure to the risk of crashing (Simons-Morton, 2007).

#### **2.4.4 Involvement of parents**

A key factor within GDL systems is the level of support that parents provide (Mayhew, 2003), particularly during the learning to drive phase. The support of parents is necessary in order to accrue sufficient driving experience (Harrison, 2004). They also provide behaviour models and will continue to influence the newly licensed driver's behaviour once they progress to solo driving (Foss, 2007).

Novices may develop driving attributes by observing their parents driving, both prior to and during the process of learning to drive (Bianchi & Summala, 2004). By modelling the behaviour of their parents, novice drivers may develop a similar driving style as well as adopt their perceptions of, and reactions to, other road users. However, novices also have many lifestyle factors in common with their parents such as place of residence, lifestyle and socio-economic status that may account for correlations in crash risk between novice drivers and parents (Bianchi & Summala, 2004).

Research suggests that while parents appreciate the provision of information designed to enhance their ability to supervise their learner drivers, it has minimal effect on what actually occurs. This may be because it is difficult to influence the often complex communication that occurs between parents and learners (Foss, 2007). This may result from the creation of emotional stress or arousal caused by the involvement of parents (Harrison, 2004). The amount of practice obtained by learner drivers may be influenced by both the learner driver, the supervisor or an interaction of both. In particular, the effect of stress on both the learner and the supervisors may lead to a decrease in supervised practice (Harrison, 2004).

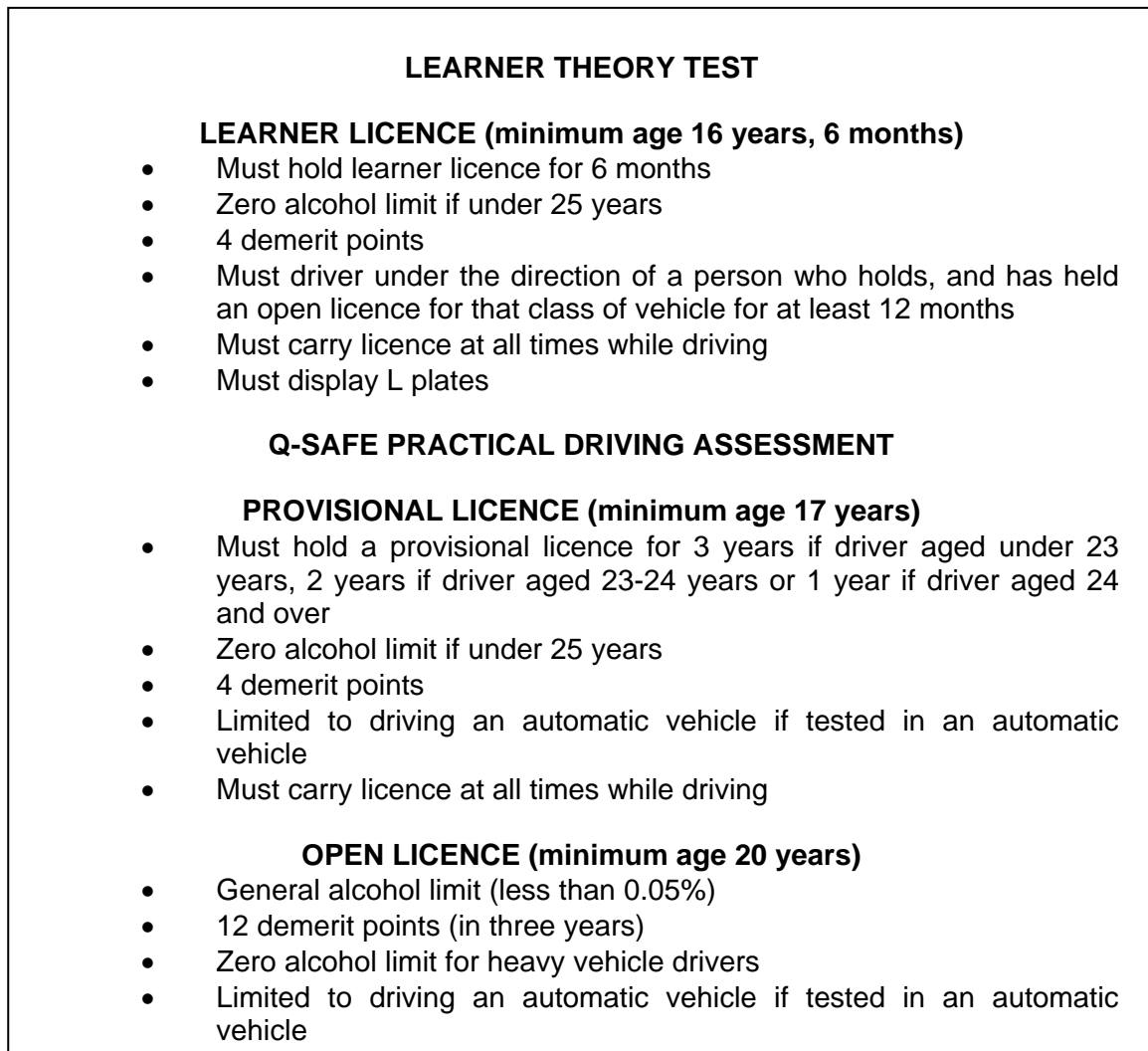
### **2.5 The learner phase in Australia**

Every state and territory within Australia has a learner phase, although differences exist in how it is applied (Senserrick, 2007). This study examines the learner phase in two of the six states, Queensland and New South Wales. These states were chosen as they represented, at the time, a more traditional learner phase and a more progressive learner phase respectively. The New South Wales system had several elements that were not present in the Queensland system at the time of the data collection.

### 2.5.1 The learner phase in Queensland

As shown in Figure 2, in Queensland at the time this study was conducted, individuals were able to obtain their learner licence once they turned 16 ½ by passing a theoretical road law knowledge test<sup>1</sup>. Individuals must hold their learner licence for a minimum of six months, display L plates and drive under supervision. If the learner is under the age of 25 years they must have a zero blood alcohol limit. If they obtain four demerit points in twelve months for offences, they lose their learner licence. Drivers are able to obtain their provisional licence at 17 years (Senserrick, 2007).

**Figure 2: Queensland's Graduated Driver Licensing System, prior to July 2007**



Source: (Queensland Transport, 2005)

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<sup>1</sup> It should be noted that a number of changes were made to the Queensland Graduated Driver Licensing system in July 2007 including lowering the minimum learner age from 16 ½ years to 16 years, introducing two provisional licence phases (P1 and P2), introducing a hazard perception test, restricting P1 drivers to one passenger aged under 21 years from 11.00pm to 5.00am and restricting provisional drivers from driving high powered vehicles (Senserrick, 2007).

## 2.5.2 The learner phase in New South Wales

At the time the research was conducted, individuals in New South Wales were able to obtain their learner licence from 16 years (see Figure 3).<sup>2</sup>

**Figure 3: New South Wales' Graduated Driver Licensing System, prior to July 2007**

<p style="text-align: center;"><b>DRIVER KNOWLEDGE TEST</b></p> <p style="text-align: center;"><b>LEARNER LICENCE (minimum age 16 years)</b></p> <ul style="list-style-type: none"><li>• Must hold learner licence for 6 months (no minimum period for drivers aged 25 years and older)</li><li>• Must complete 50 hours of supervised practice in logbook</li><li>• Zero alcohol limit</li><li>• Must drive under the direction of a person who holds a full licence and is under the 0.05 BAC limit</li><li>• Restricted to speeds 80km/hr or below</li><li>• Unable to tow</li><li>• Must display L plates</li></ul> <p style="text-align: center;"><b>DRIVING ABILITY ROAD TEST</b></p> <p style="text-align: center;"><b>PROVISIONAL LICENCE 1 (minimum age 17 years)</b></p> <ul style="list-style-type: none"><li>• Must hold provisional licence 1 for 12 months, valid for 18 months</li><li>• Zero alcohol limit</li><li>• 3 demerit points</li><li>• Limited to driving an automatic vehicle if tested in an automatic vehicle</li><li>• Restricted to speeds 90 km/hr or below</li><li>• Able to tow a maximum of 250 kg</li><li>• Must display P plates</li></ul> <p style="text-align: center;"><b>HAZARD PERCEPTION TEST</b></p> <p style="text-align: center;"><b>PROVISIONAL LICENCE 2 (minimum age 18 years)</b></p> <ul style="list-style-type: none"><li>• Must hold provisional licence 2 for 24 months, valid for 36 months)</li><li>• Zero alcohol limit</li><li>• Restricted to speeds 100 km/hr or below</li><li>• Must display P plates</li></ul> <p style="text-align: center;"><b>DRIVER QUALIFICATION TEST</b></p> <p style="text-align: center;"><b>OPEN LICENCE (minimum age 20 years)</b></p> <ul style="list-style-type: none"><li>• General alcohol limit (less than 0.05)</li><li>• 12 demerit points (in three years)</li><li>• Zero alcohol limit (0.00 BAC) for heavy vehicle drivers</li></ul>
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<sup>2</sup> The Graduated Driver Licensing system was amended from 1 July 2007 in New South Wales with changes including the learner period being extended to 12 months and requiring 120 hours of practice. Drivers on a P1 licence are now limited to one passenger aged less than 21 years from 11.00pm to 5.00am and there is a zero tolerance on speeding. Any provisional driver caught speeding has their licence suspended for three months (Senserrick, 2007).

*Source: (Roads and Traffic Authority, 2004; Senserrick & Whelan, 2002)*

Similar to the Queensland system, the learner licence is obtained by passing a road law knowledge test and must be held for a minimum of six months. Learner drivers in New South Wales must display L plates and drive under supervision with a zero blood alcohol limit. They are restricted to a maximum speed of 80 kilometres per hour and also have a towing restriction. Drivers are eligible to progress to the next stage in the graduated licensing system once they turn 17 years (Senserrick, 2007). The biggest difference between the Queensland and the New South Wales licensing systems is the requirement for learner drivers in New South Wales to record a minimum 50 hours of driving experience in a logbook.

## **2.6 The provisional phase**

Although this research does not directly investigate novice drivers' experiences while they were driving on their provisional licence, the provisional phase is a key feature of GDL systems. It is designed to reduce new drivers' exposure to risky situations when they first commence driving without supervision. This is achieved by limiting their driving in certain situations such as at night, with passengers or after drinking alcohol (Preusser & Leaf, 2003).

### **2.6.1 The provisional phase in Queensland**

As shown in Figure 2, new drivers in Queensland obtain a provisional licence after they successfully pass a practical driving test. The minimum age that drivers can obtain this licence is 17 years. If the driver is under 25 years they must adhere to a zero blood alcohol limit (BAC). They are limited to driving automatic vehicles if the vehicle that they drove in the practical driving exam was an automatic vehicle. They must carry their licence at all times while driving. The length of time that they hold their provisional licence varies according to age. There is no exit test from the provisional phase and drivers are automatically granted an open licence on the completion of their minimum period of holding their provisional licence (Queensland Transport, 2005; Senserrick, 2007). As noted earlier, the Queensland system has implemented changes affecting the provisional phase from July 2007.

### **2.6.2 The provisional phase in New South Wales**

In New South Wales, new drivers progress through two provisional licence phases with differing requirements in each. As shown in Figure 3, drivers are able to obtain their P1 licence at a minimum age of 17 years after they successfully pass a practical driving test. The P1 licence must be held for at least 12 months and drivers must drive at a maximum of 90 kilometres per hour. They are unable to tow anything heavier than 250 kilograms. Drivers are able to obtain a P2 licence once they pass a hazard perception test. Drivers on a P2 licence are not supposed to drive faster than 100 kilometres per hour. This licence must be held for a minimum of two years. Drivers pass a Driver Qualification Test that enables them to obtain their open licence (Roads and Traffic Authority, 2004; Senserrick, 2007). The New South Wales system has also changed since July 2007.

There are two restrictions that are common to both the P1 and P2 licence. Drivers must display P plates to indicate to other drivers their licence status and they are required to adhere to a zero BAC limit (Roads and Traffic Authority, 2004; Senserrick, 2007).

## 2.7 Theoretical perspectives

A number of mainstream psychological and criminological theories have been utilised in road safety to assist in the explanation and prediction of driving behaviour. Among the theories used extensively are deterrence theory (Homel, 1988), the theory of planned behaviour (Desrichard, Roche, & Begue, 2007; Elliott, Armitage, & Baughan, 2005; Lajunen & Rasanen, 2004), problem behaviour theory (Cavoioia, Strohmets, & Abreo, 2007), health belief model (Lajunen & Rasanen, 2004), sensation seeking (Jonah, 1997; Jonah et al., 2001), locus of control (Lajunen & Rasanen, 2004) and various forms of social learning theory (DiBlasio, 1987; Watson, 2004c).

The review of these theories suggests that the two particularly relevant for this research are social learning theory and sensation seeking. In order to fully explain behaviours, theories should encompass the underlying factors that impact on the behaviour. As outlined above, there are personal, social and legal factors that affect young drivers. Therefore the theories used to explain new driver experiences need to capture these factors. Social learning theory encompasses these factors. Sensation seeking was chosen as it is relevant in explaining the behaviour of young people.

While Akers' Social Learning Theory has not been used widely in road safety research, it has been recently used successfully to examine unlicensed driving behaviour (Watson, 2004a), speeding (Fleiter & Watson, 2005) drink driving (Armstrong & Ryan, 2006) and drug driving (Armstrong, Wills, & Watson, 2005). In contrast, sensation seeking has been used more extensively with behaviours such as risky driving (Jonah et al., 2001), drink driving (Armstrong & Ryan, 2006), drug driving (Armstrong et al., 2005), speeding (Fleiter & Watson, 2005) and aggressive driving (Jonah et al., 2001) research.

### 2.7.1 Social learning theory

Social learning theory proposes that both the consequences of behaviour and the individual's beliefs about those consequences affect behaviour (Carlson & Buskist, 1997). The key features of this theory include: the emphasis on the role of vicarious, symbolic and self-regulatory processes, acknowledging that direct experiences and observation affect human behaviour, ability to use symbols to represent other events and actions, ability to self-regulate and the recognition that people and environment influence each other (Bandura, 1977). Social learning theory has been used in a wide range of areas within health psychology to explain behaviours such as drinking (Brannon & Feist, 2004).

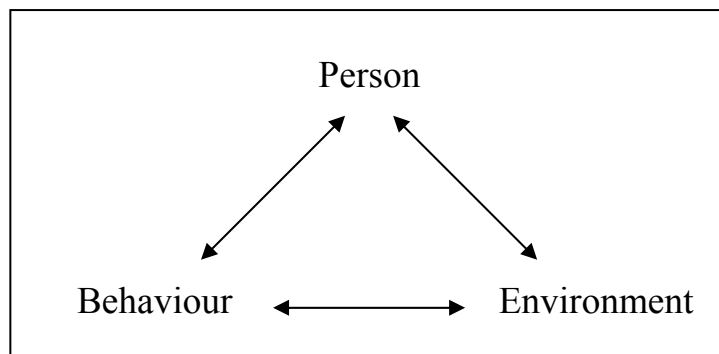
Individuals learn, either deliberately or not, by observing others. This is known as modelling. While a lot of modelling is based on the observation of real people, advances in technology mean that symbolic models may also be presented either verbally or pictorially (Bandura & Walters, 1969). This could occur through handbooks or television. As a result the importance of parents as models may be decreasing. The use of modelling in everyday living is particularly useful as it enables the development of skills without needless errors (Bandura, 1971). Modelling is also known as imitation, observational learning, internalisation, social facilitation and role-taking (Bandura, 1971). In order for modelling to occur, four processes must take place: attention, retention, motor reproduction and motivation (Bandura, 1977).

Attentional processes are necessary to commence the modelling process. This process determines which events the individual selects to observe from all events they are exposed to and what they take out from this exposure (Bandura, 1977). Retention is critical for modelling. Unless individuals remember the activities that they have observed, they are unable to replicate the behaviour (Bandura, 1977). The third step in modelling involves translating the remembered activities into action (Bandura, 1977).

The final process necessary for modelling to occur is motivation. Although individuals observe a wide range of enacted behaviours, they do not replicate them all. Individuals tend to replicate a modelled behaviour if it results in an outcome that they value (Bandura, 1977). It is less likely to be replicated if the initial behaviour observed resulted in punishment. Conversely, it is likely to be replicated if the initial behaviour is either personally or socially rewarding.

An important component of social learning theory is reciprocal determinism (Phares & Chaplin, 1997). Reciprocal determinism is a concept that explains how behaviours, persons and environment all interact and influence each other. Figure 4 illustrates these relationships. Reciprocal determinism is a useful concept for road safety, as there is generally more than one factor responsible for a crash. It reflects the complexity of the interface between driver, vehicle and road environment.

**Figure 4: Reciprocal determinism**



*Source: (Phares & Chaplin, 1997)*

A key benefit of this theory is that it acknowledges both the importance of intrinsic, cognitive factors as well as the role of learning in development (Baron, 1998). While other psychological theories acknowledge either cognition or learning, social learning theory combines both. This is consistent with principles of modern psychology. Another benefit of social learning theory is that it has been used effectively to modify undesirable behaviours (Perry & Bussey, 1984). Therefore, the theory is useful in an applied setting and is relatively easy to operationalise. This allows objective measurement of the theory and empirical evaluations (Perry & Bussey, 1984).

One criticism is that social learning theory does not directly address inner conflicts and the role of unconscious thoughts on behaviour (Baron, 1998). Therefore, social learning theory does not adequately capture all the factors contributing to the risk of novice drivers. However, the existence of unconscious thoughts on behaviour is not denied, rather, social learning theory advocates that they should be interpreted in a different context.

### **Akers' Social Learning Theory**

This research has been guided by Akers' version of social learning theory. Akers believed that other models such as deterrence and rational choice theory were able to be subsumed within social learning theory (Akers, 1990). Akers has used this model to explain a number of behaviours including adolescent drinking and drug behaviour (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979) and adolescent smoking (Akers & Lee, 1996).

Akers' model of social learning differs from the Bandura model described above as Akers used his model to specifically focus on deviance and criminal behaviour (Akers, 1994). However, Akers also believed that both conforming and deviant behaviour were learnt using the same process (Akers &



Lee, 1996). This behaviour, either positive or negative, is decided by the balances between the various influences. It is generally stable but may change with time or circumstances (Akers & Lee, 1996).

Akers' theory proposes that there are four factors that influence behaviour. These are differential association, differential reinforcement, imitation and personal attitudes (Akers & Lee, 1996). Differential association is direct and indirect interaction with other individuals and organisations. This includes friends and family but may also include others such as work colleagues who are able to provide patterns of reinforcement, normative definitions and exposure to models (Akers, 1985). As a result, individuals behave in similar ways to those that they associate with.

Differential association has a behavioural aspect as well as a normative aspect (Capece & Akers, 1995). The behavioural dimension refers to the amount of association an individual has with the other individuals and organisations. The normative dimension refers to the overall shared climate found within the groups towards shared behaviours (Capece & Akers, 1995).

Differential reinforcement refers to the positive and negative reinforcements that are linked to current behaviour as well as alternative behaviours (Akers et al., 1979). Positive reinforcements are the provision of a pleasurable experience while a negative reinforcement is the removal of a painful experience (Capece & Akers, 1995). These reinforcements can be intrinsic and/or extrinsic.

Imitation refers to the process of observational learning or modelling (Akers & Lee, 1996). Modelling is important for the initial behaviour, however, it becomes less important as the behaviour continues (Akers et al., 1979).

Personal attitudes are learnt through interactions with significant groups. These definitions include norms, attitudes and orientations. They define behaviour as positive or negative. The definitions act as cues to behaviour that can be directly reinforced. If an individual defines an action as good or, at a minimum, justified, the more likely they are to engage in that behaviour. They are less likely to engage a behaviour that is defined as adverse. These definitions are known as positive, neutralising and negative respectively (Akers et al., 1979).

## **2.7.2 Sensation seeking**

Sensation seeking is an aspect of personality that relates to the desire to discover new and intense experiences (Zuckerman, 1990). High sensation seekers are more likely to engage in a range of risky behaviours including substance abuse (Teichman, Barnea, & Rahav, 1989), participation in high-risk sports (Hambaugh & Garrett, 1974) and driving at high speeds (Zuckerman & Neeb, 1980). Adolescents are more likely to be high sensation seekers than adults (Baron, 1998). Adolescents aged 16 to 19 years have the highest rates of sensation seeking (Williamson, 1999).

A number of studies have established a strong association between sensation seeking and risky driving (Jonah, 1997). These behaviours include drink driving, speeding and following too closely.

The use of the sensation seeking model and Akers' Social Learning Theory will add value to this research. Traditionally, social learning theory has included non-social reinforcement in the differential reinforcement component. However, much of the research in this area has focussed on social reinforcement rather than non-social reinforcement (Brezina & Piquero, 2003). The inclusion of sensation seeking may help to predict learner driver behaviours more fully than if the non-social reinforcement element of social learning theory was used individually.

## 2.8 Key research question and summary

### 2.8.1 Key research question

This study aimed to gain a quantitative picture of learner driver experiences. To facilitate this, the following research question was formulated:

Research Question – How do the pre-July 2007 GDL systems in Queensland and New South Wales impact on learner driver experiences?

This research question will be answered by comparing the experiences of learner drivers in Queensland and New South Wales.

### 2.8.2 Summary

Young, newly licensed drivers have the highest crash risk when compared with other groups of drivers. This crash risk is influenced by a number of factors including social and situational influences (passengers, alcohol and drugs, social group and peers), exposure-related factors (time of day and week, amount of time on the road, environmental factors) and young driver factors. There are four types of young driver factors including core attributes (age, gender, clinical conditions and personality), modifiable attributes (skill, experience, education and training), situational assessment, decision-making and hazard perception (motivation, decision-making, hazard perception) and driver behaviour (violations and driving style) (Williamson, 1999).

The two countermeasures that are implemented most widely to help reduce crash risk for young drivers are education and training as well as GDL. However, driver education and training is often criticised for its limited capacity to reduce crashes with reviews frequently unable to link this countermeasure with crash reduction.

In contrast, GDL aims to gradually increase the exposure of new drivers to more complex driving situations. GDL systems typically consist of learner, provisional and open licence phases. Evaluations of North American GDL systems have demonstrated reductions in crash risk for the youngest new drivers of between 20 per cent and 40 per cent (Shope, 2007). The first phase of a GDL system, the learner licence, is designed to allow new drivers to obtain practical driving experience in a lower risk situation. Benefits from this phase may result from delayed licensure, the supervised learning process, mandated hours of practice and the involvement of parents.

Every state and territory within Australia has a learner phase within their GDL system, although, there are differences in how it is applied. This study is examining the learner phase in two states; Queensland and New South Wales. At the time of the study, New South Wales had a more advanced learner system while the Queensland system was more traditional. The major difference between the two systems was the requirement that learners in New South Wales complete a minimum of 50 hours of practice prior to obtaining their provisional licence.

Two theories will be used to help explain young driver experiences on their learner licence in these two Australian states: Akers' Social Learning Theory and sensation seeking. Akers' theory states that there are four factors that influence behaviour: differential association, differential reinforcement, imitation and personal attitudes. Sensation seeking theory states that high sensation seekers are more likely to engage in range of risky behaviours. The group with the highest rates of sensation seeking are adolescents aged 16 to 19 years.

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## **3 METHODOLOGY**

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### **3.1 Methodological considerations**

This research involved descriptive and explanatory research methods enabling the development of a fuller understanding of learner driver experiences. Descriptive research enables researchers to describe the characteristics of various groups, to estimate the amount of the population engaging in a particular behaviour (Malhotra, Hall, Shaw, & Crisp, 1996). Explanatory research enables researchers to determine why something has occurred (Fitzgerald & Cox, 2002).

Another key methodological consideration was to select a recruitment strategy that maximised the likely response rate to enhance the representativeness of the data. This study differs significantly from the cohort studies currently being conducted in New South Wales (Ivers et al., 2006) and Western Australia (Palamara & Stevenson, 2003). By adopting a cross-sectional design we hoped to obtain a higher response rate and thereby obtain a more representative sample. This will provide an interesting contrast to the samples collected in large cohort studies, which typically have lower response rates.

### **3.2 Design**

Among the methods considered for data collection in this study was on-line administration. This technique was used in a pilot study examining novice drivers (Ivers et al., 2003). In the first trial, the researchers posted a letter of invitation to participants to invite them to complete the survey on-line or to ring to obtain a survey. The researchers obtained a seven per cent participation rate for this method. They also posted the full survey to potential participants. A 12 per cent participation rate was obtained with this method. After the first trial, the researchers conducted a focus group to identify more effective methods of obtaining responses. In the second trial, the researchers offered a movie ticket as an incentive. With this incentive, they obtained a participation rate of 19 per cent for the letter of invitation and 20 per cent for those sent the entire survey. The researchers also trialled a third method of sending a postcard with the website listed. The postcard method had a two per cent participation rate.

Another distribution method considered was email. Using this technique, participants receive an introductory email announcing the research and offering them the choice of participating. However, it is only suitable for participants who have access to and use email (Boynton, 2004) and thus excludes a potentially large group of participants.

Given the relatively low response rates achieved by the above methods, it was decided to use a face-to-face participant recruitment method combined with a telephone interview in this study. The higher response rates achievable with this method would likely enhance the representativeness of the sample obtained. This methodology was selected based on the results of a pilot undertaken in New Zealand (Begg, Brookland, Hope, Langley, & Broughton, 2003). The first survey within the pilot study had a 91 per cent participation rate. Participants were recruited face-to-face by project staff. If participants were unable to participate immediately, they were able to post surveys to the researchers. The second survey was administered by telephone. The researchers were able to contact 100 per cent of the participants and had a 97 per cent participation rate for the second survey.

### 3.3 Piloting

The study had two pilots, a qualitative and a quantitative. The aim of the qualitative pilot was to ensure that the constructs and terminology used within the questionnaire were understood by the target population. The qualitative pilot occurred outside a large metropolitan licensing centre in Queensland on 15 December 2005. The researcher decided to conduct the pilot in the same manner as the main study in order to gauge the effectiveness of the proposed recruitment method.

The researcher waited outside the licensing centre in the area where learner drivers completed their driving exams. Individuals who had successfully completed their test were approached and asked if they would participate in a study of learner drivers. The learners were offered a movie ticket as an incentive.

The driving examiners were unable to inform the researcher whether potential participants had passed or failed their exam for privacy reasons. However, it was easy to identify successful learners as they left their vehicle and went inside the centre to obtain their provisional licence. As a general rule, those who failed left almost immediately after a discussion with the driving examiner.

The researchers spoke to six participants (four female and two male) asking a range of questions including:

- How difficult was it to find opportunities to practice? Why?
- Have you ever done a driver education course? What type?
- What driving experience did you have prior to getting a learner licence? e.g. Driving off-road
- What do you think your chances are of getting caught by the police for breaking the road rules while on your provisional licence?
- Do you know of many people who break the road rules? Who are they (are they family, friends or acquaintances)?

The results of the qualitative pilot informed the development of the study questionnaire, piloted in the next phase. A copy of the results of the qualitative pilot are attached in Appendix A.

After the successful completion of the qualitative pilot, the quantitative pilot was conducted at the same location. This involved administering the interview on-site to learners who successfully completed their driving test. The method used to recruit participants was identical to that used in the qualitative pilot. The only difference was the length of time required. While learners could complete the qualitative pilot in 10 minutes, it took 35 minutes to complete the full quantitative interview.

This resulted in a very low participation rate of 14 per cent ( $N = 7$ ). The researchers concluded that 35 minutes was too long for many learners who had work or study commitments following their test. It also appeared too long for driver trainers (who accompanied many of the learners) who had other training commitments and often had to drive the participants home or elsewhere first.

As a result of this piloting, it was decided to change the method of administering the interview. The researchers decided to amend the methodology so that learners were recruited at the licensing centre but the survey was administered over the telephone within the next couple of weeks. This improved the participation rate in the second phase of the quantitative pilot to 57 per cent ( $N = 14$ ).

The quantitative pilot resulted in minimal changes to the questionnaire. The most significant change was amending the way question 34 (see Appendix B) was scored. This question asked the learner

drivers about the behaviours their parents displayed while driving. It was originally scored on a five point scale from none to all. This was designed to take into account that some individuals may perceive that they have more than two parents due to an increase in the number of mixed families. However, this scale confused participants who were providing information on how often their parents engaged in each behaviour rather than the number of their parents. In the reworded question, participants were asked to provide information on how many of their parents engage in each behaviour.

### **3.4 Sample**

Participants in the main study comprised 392 learner drivers who had recently passed their practical driving test. Participants were recruited from two Australian states, Queensland and New South Wales. In order to gain a more representative sample, participants were recruited from both metropolitan and regional driver licensing centres, although only large licensing centres were used to ensure that there was a sufficient throughput of individuals attempting their practical driving test. The actual driver licensing centres were selected after consulting with Queensland Transport and the New South Wales Roads and Traffic Authority. These consultations enabled the locations to be selected based on the number of practical driver licensing tests undertaken by new drivers. The characteristics of the sample are described more fully in the results section.

### **3.5 Procedure**

In the main study, like the pilots, learner drivers were approached outside driver licensing centres and asked to participate in the research. Each person was offered a movie ticket as an incentive. The recruiter recorded their name, phone number and a list of times that they were unable to be contacted by telephone.

Participants were recruited from driver licensing centres in Queensland and New South Wales. Potential participants were approached by the recruiter who outlined the study and its purpose. Information was also provided regarding the voluntary nature of the study. After agreeing to participate in the study, individuals provided their contact details.

Within a few weeks of the initial contact, the participants were contacted by telephone and the survey was administered via interview. If the interviewers were unable to contact the learner driver initially, they continued to ring back up to three times. If the learner driver was unable to complete the interview at that time, the interviewer made an alternative time with the learner.

The interview took approximately 35 minutes to administer. At the conclusion of the interview, the researcher collected a postal address which was kept separate from the questionnaire. The movie ticket incentive was then posted to participants.

### **3.6 Measures**

The survey questionnaire was designed to collect information on the personal, social, environmental and socio-demographic factors that affect learner drivers and was informed by the theoretical perspectives discussed earlier. A copy of the questionnaire is attached in Appendix B. A copy of the information sheet and consent form is attached as Appendix C.

### ***Socio-demographic variables***

The questionnaire collected a range of socio-demographic information including gender, age, marital status, education, education of parents, income and employment status (questions 1-10). There were also questions regarding access to a vehicle, attempts at the learner test, amount of supervised practice, completion of a driver education course, the person who provided the most instruction, difficulties in finding time to practice and whether they obtained a manual or an automatic licence (questions 11-23). Their assessment of the risk involved in driving was also asked (question 26).

### ***Self-reported behaviour and experience while on a learner licence***

The questionnaire collected information regarding the learner's behaviours and experiences while learning to drive on a seven point scale from never to always (questions 24-25). This scale was based upon the list of behaviours and experiences that were identified from the literature and the structure of the driver licensing system in Queensland and New South Wales. The scale asked questions about behaviours such as displaying L plates, speeding and wearing seat belts as well as experiences such as practising in rural areas, at night, with passengers or on the weekend.

Some of the items that measured self-reported learner behaviour were used to create a learner driver behaviour scale. This scale consisted of eight items that measured learner driver behaviours while on their learner licence (see Appendix E). This scale had a Cronbach's alpha of .692.

### ***Sensation seeking***

The questionnaire used the Driver Thrill-Seeking Scale to measure sensation seeking (question 27) (Matthews, Desmond, Joyner, Carcary, & Gilliland, 1997). The Driver Thrill-Seeking Scale was selected as it is designed to measure sensation seeking within a road safety context. This scale had a Cronbach's alpha of .86.

### ***Provisional driver behavioural intentions scale***

Question 30 asked participants to explain how they intended to drive on their provisional licence. This scale was based upon the structure of the driver licensing systems in Queensland and New South Wales and asked four items that measured how they intended to drive while on their provisional licence. This scale had a Cronbach's alpha of .54 (see Appendix E).

### ***Perceptions about breaking the road rules***

A number of items were included to assess the participants perceptions toward breaking the road rules (questions 31-32).

### ***Exposure to models***

Questions 33-35 asked the participants about their exposure to various models including parents, friends and other drivers. These questions were adapted from other road safety studies using Akers' Social Learning Theory (for example, (Fleiter & Watson, 2005; Watson, 2003).

### ***Self-reported offence and crash involvement***

The questionnaire asked the participants to provide information regarding their crash and offence involvement while on their learner's licence (questions 36-37).

### ***Differential association***

Several scales were created to measure the dimensions of Akers' Social Learning Theory. Differential association has two dimensions, the behavioural dimension and the normative dimension. The behavioural dimension was operationalised in terms of the number of individuals that the participants knew obeyed the road rules. The behavioural dimension scale was created by asking participants questions regarding how many of their friends (14 questions, Cronbach's alpha of .825), parents (11 questions, Cronbach's alpha of .693) and other drivers (11 questions, Cronbach's alpha of .761) adhere to the road rules. These questions are contained in Appendix E.

The normative dimension of differential association refers to the shared evaluative climate found within groups towards behaviours. The normative dimension was measured by asking participants a series of four questions regarding the beliefs of others pertaining to the obeying of road rules. These questions are contained in Appendix E. This scale had a Cronbach's alpha of .608.

### ***Imitation***

Imitation is an important component of social learning theory, however, it can be difficult to operationalise in a way that clearly distinguishes between the concepts of imitation and the behavioural dimension of differential association. For this reason, the behavioural dimension scales are also used to measure imitation.

### ***Personal attitudes***

Personal attitudes refers to the beliefs, attitudes and orientations that people hold in relation to different behaviours and their alternatives. They can define behaviour as positive, negative or neutral and can be directly reinforced and act as a cue. Personal attitudes were measured on a scale consisting of three items (see Appendix E). This scale had a Cronbach's alpha of .589.

### ***Differential reinforcement***

Differential reinforcement relates to the balance of anticipated positive and negative reinforcements linked to current and alternative behaviours. These reinforcements can be extrinsic or intrinsic. They also include a non-social reinforcement element. Anticipated negative reinforcements were measured using a seven item scale (see Appendix E) and had a Cronbach's alpha of .737. The anticipated positive reinforcements were measured using a four item scale (see Appendix E) and had a Cronbach's alpha of .730.

## **3.7 Analyses**

Data was analysed using the Statistical Package for the Social Sciences (SPSS) v.14. The method used to collect the data meant that there were no partially completed surveys and very little missing data. As a result, missing values were generally excluded from the analyses as there was very little impact on sample sizes. The significance level ( $\alpha$ ) used, unless otherwise specified, was set at .05.

Non-parametric tests were used to analyse the categorical data collected in the interview. The independence of the categorical variables was tested using the chi-square ( $\chi^2$ ) test. The strength of association between the categorical variables was measured using either the phi ( $\phi$ ) coefficient for 2 x 2 tables or the Cramer's Phi ( $\phi_c$ ) coefficient for tables greater than 2 x 2. These coefficients provided an indication of effect size with .10 representing a small effect size, .30 a medium effect size and .50 a large effect size (Cohen 1988, cited in Aron & Aron, 1991). Additionally, the phi coefficient can be squared to arrive at the variance explained (Smithson, 2000).

Parametric methods were used to analyse data collected by Likert scale, although this is not strictly interval data. This enabled the use of more sophisticated parametric analyses that would have not been possible using non-parametric tests. The various scales used within this study were assessed for reliability. A summary of the scales and their Cronbach's alpha is available in Appendix E.



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## 4 RESULTS

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### 4.1 Sample characteristics

#### 4.1.1 Response rate

Two response rates were calculated for this study; the first was the number of people who originally agreed to participate in the study when approached at driver licensing centres while the second relates to those who actually completed the telephone interview.

Of the 779 people approached at the driver licensing centres, 687 were eligible to participate in the study as they had successfully completed the practical driving test to obtain their provisional licence. Of the eligible individuals, 494 agreed to participate in the study. This represents an initial response rate of 71.9 per cent. Some basic information was collected about those people who did not agree to participate including: gender, whether they were accompanied by a supervisor and the geographic location. This was done to check for potential non-response bias. Table 1 below compares individuals who agreed to participate with those who did not on those variables mentioned above as well as the recruiter.

The chi-square tests identified that there were statistically significant differences between those who agreed to participate and those who did not in terms of gender, the recruiter and the geographic location. Females (75.9 per cent) were more likely to participate in the study than males (67.2 per cent). There were statistically significant differences between the success rates of various recruiters with recruiters two (81.7 per cent), five (82 per cent) and seven (86 per cent) all achieving 'yes' rates above 80 per cent. There was also a statistically significant difference between the response rates across various locations with learners in Newcastle (86 per cent) and Brisbane (77.1 per cent) most likely to agree to participate in the study. As different recruiters worked in different locations, the geographic location may have affected the success rate of the recruiter or vice versa. There was no statistically significant difference between the groups in terms of whether the people were accompanied or not.

**Table 1: Characteristics of individuals approached to participate**

Characteristic	Agreed to participate	Did not agree to participate	Significance level
<i>Gender</i>	<i>N</i> = 494	<i>N</i> = 196	
Males	<i>n</i> = 227 (67.2%)	<i>n</i> = 111 (32.8%)	$X^2(1) = 6.4, p = .01$ $\phi = -.1$
Females	<i>n</i> = 267 (75.9%)	<i>n</i> = 85 (24.1%)	
<i>Supervisor accompanying</i>	<i>N</i> = 483	<i>N</i> = 185	
Driving School	<i>n</i> = 312 (72.7%)	<i>n</i> = 117 (27.3%)	$X^2(2) = .759,$ $p = .684$ $\phi_c = .034$
Parent	<i>n</i> = 134 (72.8%)	<i>n</i> = 50 (27.2%)	
Other	<i>n</i> = 37 (67.3%)	<i>n</i> = 18 (32.7%)	
<i>Recruiter</i>	<i>N</i> = 494	<i>N</i> = 196	
Recruiter 1	<i>n</i> = 24 (61.5%)	<i>n</i> = 15 (38.5%)	$X^2(6) = 31.41,$ $p < .001$ $\phi_c = .213$
Recruiter 2	<i>n</i> = 107 (81.7%)	<i>n</i> = 24 (18.3%)	
Recruiter 3	<i>n</i> = 24 (60%)	<i>n</i> = 16 (40%)	
Recruiter 4	<i>n</i> = 126 (65.6%)	<i>n</i> = 66 (34.4%)	
Recruiter 5	<i>n</i> = 41 (82%)	<i>n</i> = 9 (18%)	
Recruiter 6	<i>n</i> = 92 (63.4%)	<i>n</i> = 53 (36.6%)	
Recruiter 7	<i>n</i> = 80 (86%)	<i>n</i> = 13 (14%)	
<i>Geographic location</i>	<i>N</i> = 494	<i>N</i> = 196	
Brisbane	<i>n</i> = 131 (77.1%)	<i>n</i> = 39 (22.9%)	$X^2(5) = 20.09,$ $p = .001$ $\phi_c = .171$
Sydney	<i>n</i> = 133 (68.2%)	<i>n</i> = 62 (31.8%)	
Townsville	<i>n</i> = 126 (65.6%)	<i>n</i> = 66 (34.4%)	
Newcastle	<i>n</i> = 80 (86%)	<i>n</i> = 13 (14%)	
Ballina	<i>n</i> = 14 (66.7%)	<i>n</i> = 7 (33.3%)	
Lismore	<i>n</i> = 10 (52.6%)	<i>n</i> = 9 (47.4%)	

The second response rate related to whether the individuals who originally agreed to participate in the study did so or not. Of the 494 individuals who agreed to participate in the study, 392 participated in a phone interview representing a response rate of 79.4 per cent. As shown in Figure 5, the reasons for non-completion was generally due to difficulties in contacting individuals (despite various ring backs).

**Figure 5: Reasons for non-completion of phone interview**

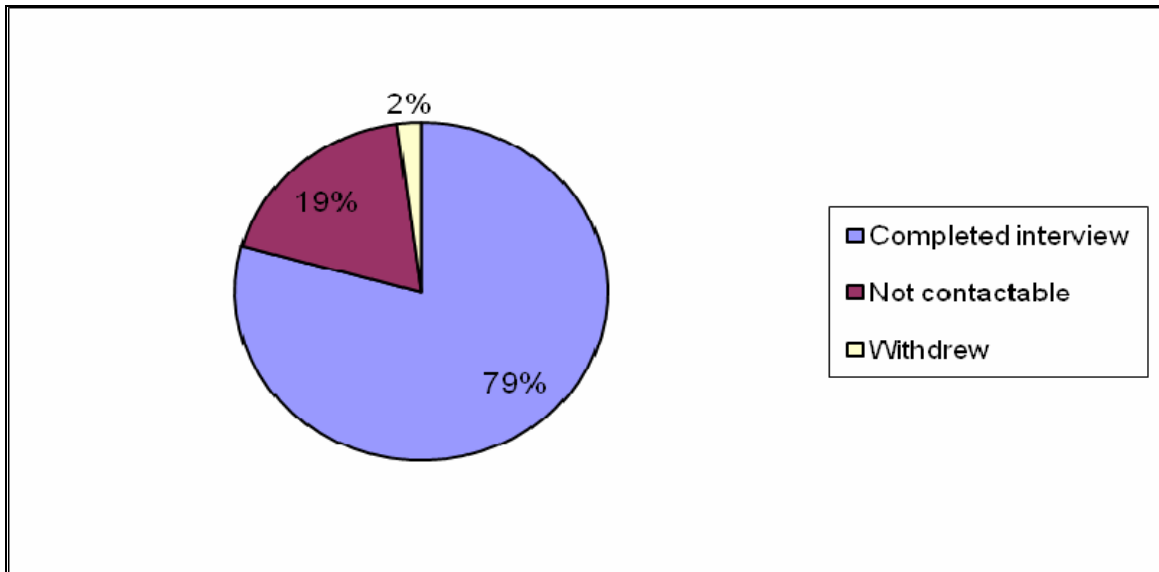


Table 2 compares those who completed the interview with those who did not on a number of characteristics including gender, the type of supervisor accompanying them and geographic location. In order to ensure that the cell size assumptions for the chi-square test were not violated, it was necessary to collapse the geographic location variable into four locations: Queensland metropolitan (Brisbane), Queensland regional (Townsville), New South Wales metropolitan (Sydney) and New South Wales regional (Lismore, Ballina and Newcastle).

The chi-square tests did not identify a statistically significant difference between those who completed the phone interviews and those who did not based upon either gender or the person who accompanied the learner driver to the test. However, there was a difference based on geographic location with individuals in regional New South Wales (35.2 per cent) less likely to complete the phone interview than those learners in other locations.

**Table 2: Characteristics of individuals who completed the study**

Characteristic	Completed interview	Did not complete interview	Significance level
<i>Gender</i>	<i>N</i> = 383	<i>N</i> = 111	
Males	<i>n</i> = 176 (77.9%)	<i>n</i> = 50 (22.1%)	$X^2(1) = 0.03,$ $p = .866$ $\phi = .008$
Females	<i>n</i> = 207 (77.2%)	<i>n</i> = 61 (22.8%)	
<i>Supervisor accompanying</i>	<i>N</i> = 383	<i>N</i> = 100	
Driving School	<i>n</i> = 243 (77.6%)	<i>n</i> = 70 (22.4%)	$X^2(2) = 2.68,$ $p = .262$ $\phi_c = .075$
Parent	<i>n</i> = 108 (80.6%)	<i>n</i> = 26 (19.4%)	
Other	<i>n</i> = 32 (88.9%)	<i>n</i> = 4 (11.1%)	
<i>Geographic location</i>	<i>N</i> = 383	<i>N</i> = 111	
QLD metro	<i>n</i> = 109 (83.2%)	<i>n</i> = 22 (16.8%)	$X^2(3) = 17.91,$ $p < .001$ $\phi_c = .19$
QLD regional	<i>n</i> = 108 (85.2%)	<i>n</i> = 18 (14.3%)	
NSW metro	<i>n</i> = 98 (74.2%)	<i>n</i> = 34 (25.8%)	
NSW regional	<i>n</i> = 68 (64.8%)	<i>n</i> = 37 (35.2%)	

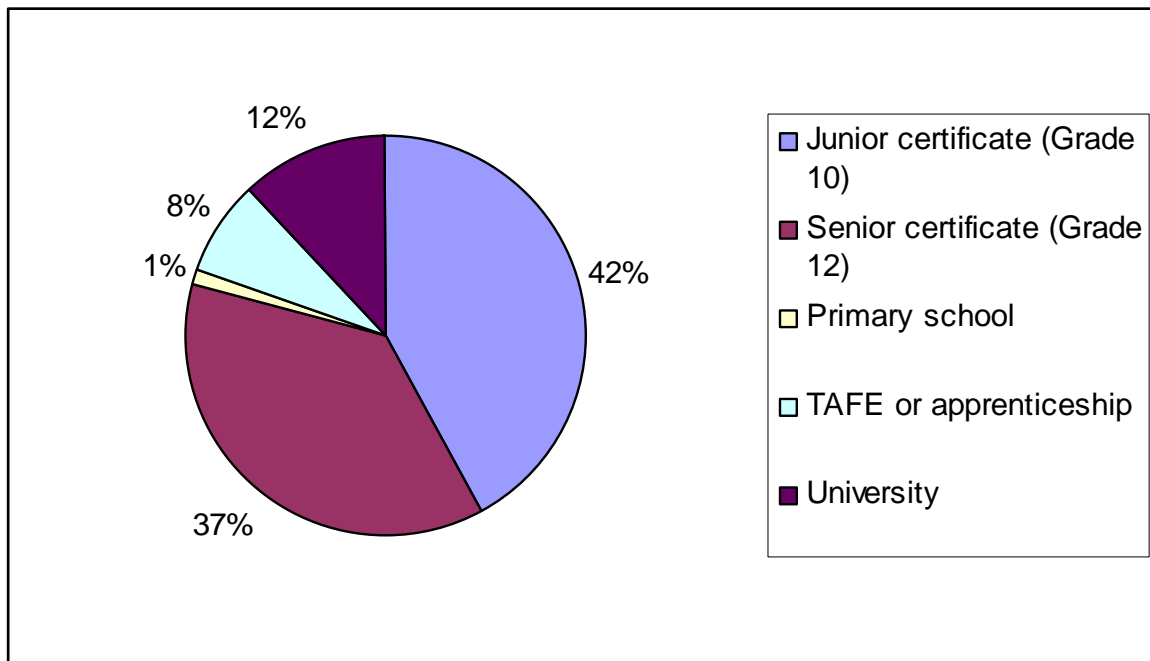
The third response rate calculated was the overall response rate. Of the 687 individuals eligible to participate, 392 completed the interview leading to an overall response rate of 57.1 per cent.

#### 4.1.2 Socio-demographic characteristics

Of the 392 participants in the sample, 180 (45.92 per cent) were male and 212 (54.08 per cent) were female. The age of participants ranged from 17 years to 44 years with a mean of 19.8 years ( $sd = 4.7$  years). The most frequent age was 17 years. Most of the sample was single ( $n = 333$ , 84.9 per cent), although some were married ( $n = 24$ , 6.1 per cent) or had a partner ( $n = 33$ , 8.4 per cent) while a small percentage had been married previously ( $n = 2$ , 0.5 per cent).

As shown in Figure 6, most of the sample had completed at least some form of secondary schooling with 41.9 per cent ( $n = 164$ ) having completed their junior certificate (grade 10) and 37.3 per cent ( $n = 146$ ) having completed their senior certificate (grade 12). A small number ( $n = 4$ , 1 per cent) had completed primary schooling only. Several participants had completed more advanced study with 7.7 per cent ( $n = 30$ ) finishing a TAFE or apprenticeship qualification and 12 per cent ( $n = 47$ ) holding a university qualification. Most participants were still studying ( $n = 261$ , 67.4 per cent).

**Figure 6: Education level of participants**



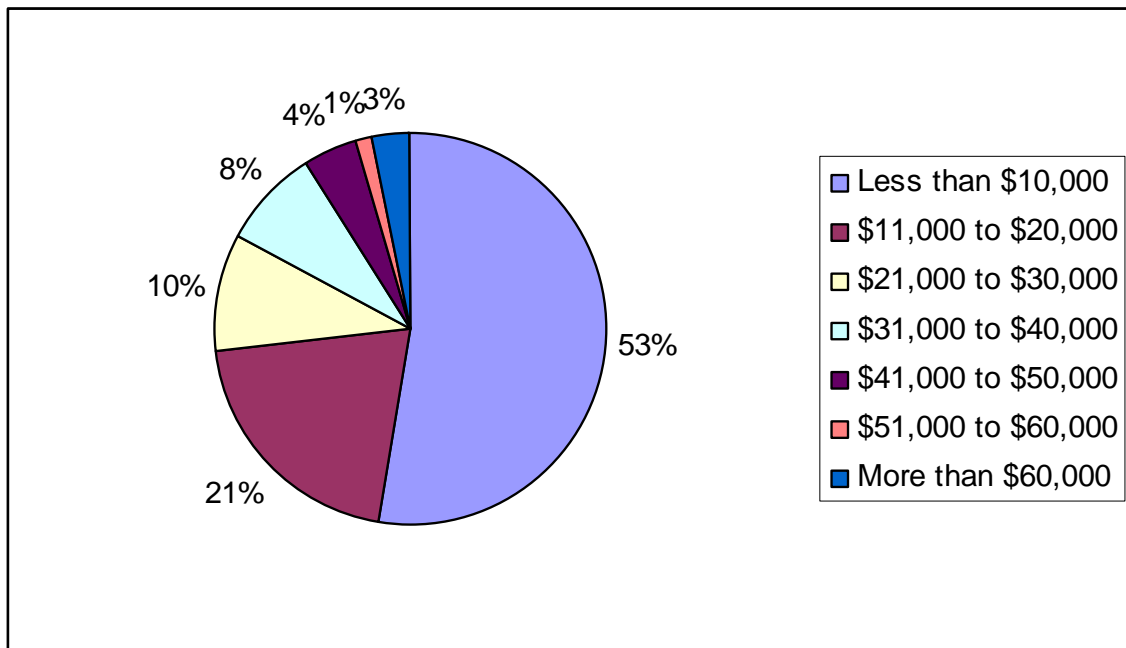
The education level of parents was more evenly distributed. Table 3 reports the education level of the participants' parents.

**Table 3: Education level of participants' parents**

Father's education level		Mother's education level	
Primary school	<i>n</i> = 10 (2.7%)	Primary school	<i>n</i> = 12 (3.1%)
Junior certificate (grade 10)	<i>n</i> = 46 (12.2%)	Junior certificate	<i>n</i> = 93 (24.4%)
Senior certificate (grade 12)	<i>n</i> = 62 (16.4%)	Senior certificate	<i>n</i> = 70 (18.4%)
TAFE/Apprenticeship	<i>n</i> = 139 (36.9%)	TAFE/Apprenticeship	<i>n</i> = 91 (23.9%)
University	<i>n</i> = 116 (30.8%)	University	<i>n</i> = 114 (29.9%)
Other	<i>n</i> = 2 (.5%)	Other	<i>n</i> = 1 (.3%)
Don't know	<i>n</i> = 2 (.5%)	Don't know	<i>n</i> = 0 (0%)

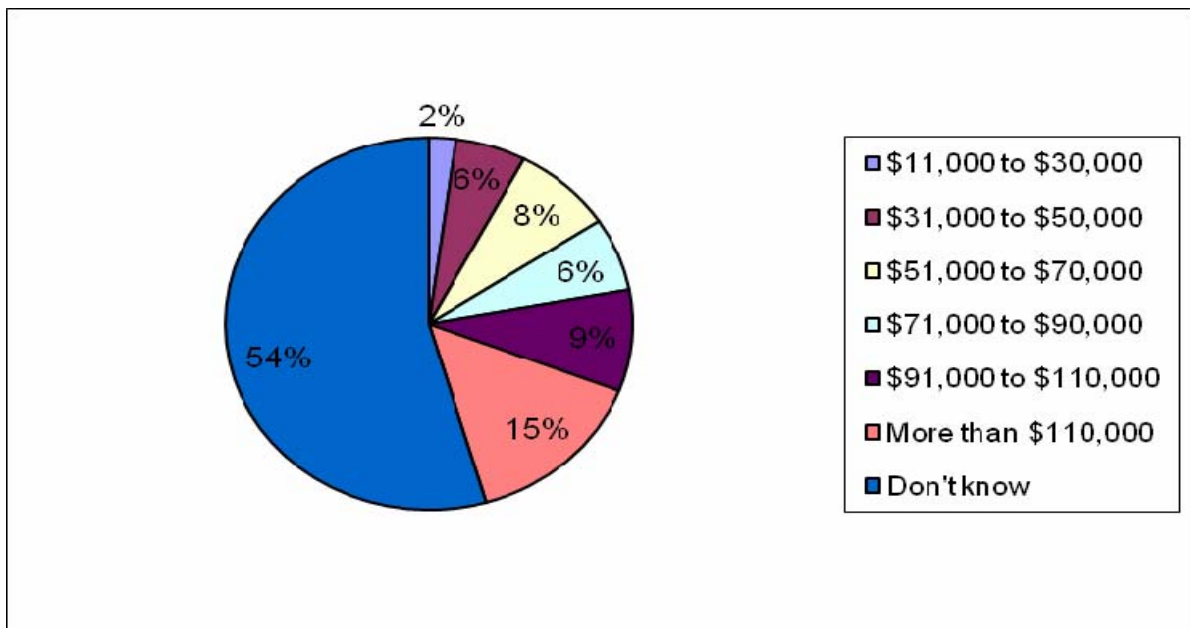
Most of the sample (*n* = 323, 82.4 per cent) worked in paid employment with 122 participants (38.1 per cent) indicating that they worked full time. The remaining 198 participants (61.9 per cent) worked part time. It is therefore not surprising that the income level of most participants was low (see Figure 7). Over half of the sample earned less than \$10,000 per annum before tax (*n* = 177, 52.4 per cent). A further 20.7 per cent (*n* = 70) earned between \$11,000 and \$20,000 with the other income categories remaining small.

**Figure 7: Annual income level of participants before tax**



Most participants were not aware of the income level of their parents ( $n = 205$ , 54.4 per cent). Of those that did respond, the reported income levels were relatively evenly distributed (see Figure 8).

**Figure 8: Parents annual income before tax**



## 4.2 Learner licence experiences

### 4.2.1 Driving variables

Analyses were undertaken to determine if there were any regional differences amongst the sample (Queensland metropolitan, Queensland regional, New South Wales metropolitan and New South Wales regional) in relation to various driving variables including:

- Completion of a driver education course;
- Person who provided the most lessons and/or practice;
- Type of licence obtained (manual or automatic);
- Type of vehicle (manual or automatic) in which the most experience was gained;
- Difficulty in finding time to practice;
- Number of times that individuals sat their learner theory test; and
- Number of vehicles available for individuals to use within their household.

Table 4 provides a summary of the first four variables above. As shown in this table, very few individuals completed a driver education course ( $n = 48$  or 12.3 per cent). Of those who did complete a driver education course, there was a statistically significant difference based on geographical location with learners living in Sydney (26.5 per cent) more likely to do so than those living in other locations.

Table 4 shows that mothers ( $n = 141$ , 36.2 per cent) provided the most supervision to learner drivers closely followed by fathers ( $n = 107$ , 27.4 per cent). In the regional areas, mothers provided the most practice with 40.7 per cent of participants from regional Queensland ( $n = 44$ ) and 46.6 per cent of participants from regional New South Wales ( $n = 35$ ) stating that their mother was the person who provided the most supervision. Professional driving instructors also provided substantial amounts of supervision ( $n = 90$ , 23.1 per cent). However, professional instructors were less likely to be the primary source of supervision in New South Wales when compared with Queensland. In metropolitan Queensland, 38.7 per cent of participants ( $n = 43$ ) stated that their professional driving instructor provided them with the most lessons and practice. This compares to 29.6 per cent of participants ( $n = 32$ ) in regional Queensland, 13.3 per cent from metropolitan New South Wales ( $n = 13$ ) and 2.6 from regional New South Wales ( $n = 2$ ).

There is a statistically significant difference in the person who provided the most lessons and/or practice to the learner based on geographical location. Individuals living in Queensland metropolitan areas were more likely to have the most lessons and/or practice from a professional driving instructor (38.7 per cent). In the New South Wales metropolitan area, fathers (40.8 per cent) were the people who provided the most lessons and/or practice to learner drivers.

**Table 4: Summary of nominal learner driver variables**

Experience	QLD metro	QLD regional	NSW metro	NSW regional	Total	Significance
<i>Completed a driver education course</i>	<i>n</i> = 110	<i>n</i> = 107	<i>n</i> = 98	<i>n</i> = 75	<i>N</i> = 390	$X^2(3) = 24.86, p < .001, \phi_c = .252$
Yes	<i>n</i> = 8 (7.3%)	<i>n</i> = 7 (6.5%)	<i>n</i> = 26 (26.5%)	<i>n</i> = 7 (9.3%)	<i>n</i> = 48 (12.3%)	
No	<i>n</i> = 102 (92.7%)	<i>n</i> = 100 (93.5%)	<i>n</i> = 72 (73.5%)	<i>n</i> = 68 (90.6%)	<i>n</i> = 342 (87.7%)	
<i>Person who provided most lessons/practice</i>	<i>n</i> = 111	<i>n</i> = 108	<i>n</i> = 98	<i>n</i> = 75	<i>N</i> = 392	$X^2(9) = 55.23, p < .001, \phi_c = .217$
Mother	<i>n</i> = 29 (26.1%)	<i>n</i> = 44 (40.7%)	<i>n</i> = 33 (33.7%)	<i>n</i> = 35 (46.6%)	<i>n</i> = 141 (36.0%)	
Father	<i>n</i> = 28 (25.2%)	<i>n</i> = 15 (13.8%)	<i>n</i> = 40 (40.8%)	<i>n</i> = 24 (32%)	<i>n</i> = 107 (27.3%)	
Professional instructor	<i>n</i> = 43 (38.7%)	<i>n</i> = 32 (29.6%)	<i>n</i> = 13 (13.3%)	<i>n</i> = 2 (2.6%)	<i>n</i> = 90 (23.0%)	
Other	<i>n</i> = 11 (9.9%)	<i>n</i> = 17 (15.7%)	<i>n</i> = 12 (12.2%)	<i>n</i> = 14 (18.6%)	<i>n</i> = 54 (13.8%)	
<i>Type of provisional licence obtained</i>	<i>n</i> = 111	<i>n</i> = 107	<i>n</i> = 98	<i>n</i> = 75	<i>N</i> = 391	$X^2(3) = 50.63, p < .001, \phi_c = .36$
Manual	<i>n</i> = 67 (60.4%)	<i>n</i> = 76 (71%)	<i>n</i> = 23 (23.5%)	<i>n</i> = 40 (53.3%)	<i>n</i> = 206 (52.7%)	
Automatic	<i>n</i> = 44 (39.6%)	<i>n</i> = 31 (29%)	<i>n</i> = 75 (76.5%)	<i>n</i> = 35 (46.6%)	<i>n</i> = 185 (47.3%)	
<i>Type of vehicle gained most experience in</i>	<i>n</i> = 111	<i>n</i> = 108	<i>n</i> = 98	<i>n</i> = 75	<i>N</i> = 392	$X^2(3) = 43.12, p < .001, \phi_c = .332$
Manual	<i>n</i> = 62 (55.9%)	<i>n</i> = 68 (62.9%)	<i>n</i> = 20 (20.4%)	<i>n</i> = 40 (53.3%)	<i>n</i> = 190 (48.5%)	
Automatic	<i>n</i> = 49 (44.1%)	<i>n</i> = 40 (37.0%)	<i>n</i> = 78 (79.6%)	<i>n</i> = 35 (46.6%)	<i>n</i> = 202 (51.5%)	

The chi-square analysis did find a statistically significant difference when considering the type of provisional licence (manual or automatic) that the learner drivers obtained and the type of vehicle (manual or automatic) that they used most while on their learner licence. There was an almost even split between those learners who obtained an automatic driver's licence (*n* = 185, 47.3 per cent) and those who obtained a manual licence (*n* = 206, 52.7 per cent). This was also true when comparing the type of vehicle that they gained most of their experience in with 202 individuals (51.5 per cent) using automatic vehicles and 190 (48.5 per cent) using manual vehicles.



Individuals living in metropolitan New South Wales were most likely to obtain an automatic driver's licence (76.5 per cent) and to obtain most of their experience in an automatic vehicle (79.6 per cent). In contrast, drivers in both metropolitan (60.4 per cent) and regional (71 per cent) Queensland were more likely to obtain a manual licence when compared with the other geographical locations. These locations also had a greater proportion of learners spending most of their time in manual vehicles (metropolitan Queensland: 55.9 per cent, regional Queensland: 62.3 per cent).

Participants within the sample were relatively uncertain ( $M = 3.08$ ,  $sd = 1.4$ ) regarding how difficult it was to find opportunities to practice. A one-way Analysis of Variance (ANOVA) identified that there were no statistically significant differences identified in the sample based on geographic area ( $F(3, 381) = 2.23$ ,  $p = .084$ ). In metropolitan Queensland, learners had a mean difficulty of 3.07 ( $sd = 1.49$ ) compared with a mean of 2.83 ( $sd = 1.36$ ) in regional areas. In metropolitan New South Wales learners had a mean difficulty of 3.16 ( $sd = 1.37$ ) compared with a mean of 3.36 ( $sd = 1.31$ ) in regional New South Wales.

Of the participants in New South Wales where there was a mandatory requirement to obtain 50 hours of supervised practice, 73 per cent advised that no parents made it difficult for them to obtain supervised practice. Seventeen per cent stated that one parent made it difficult to obtain supervised practice and the remaining 10.1 per cent said that two parents made it difficult to obtain supervised practice.

The average number of times that individuals sat the learner test was 1.84 ( $sd = 1.8$ ), although there were variations amongst the four locations. In Queensland, learners in the metropolitan area attempted the learners test on average 1.75 times ( $sd = 1.03$ ) while in the regional area they attempted it an average of 2.11 times ( $sd = .92$ ). In comparison, learners in metropolitan New South Wales attempted the learners test on average 1.95 times ( $sd = 3.16$ ). In regional New South Wales the mean number of attempts by learners of the theory test was 1.46 times ( $sd = .88$ ). An ANOVA found that there was no difference across locations in the number of times that individuals sat their learner licence theory test ( $F(3, 384) = 2.16$ ,  $p = .093$ ).

An ANOVA did identify that there was a statistically significant difference in the number of vehicles that were available for learners to use in their own households ( $F(3, 379) = 3.401$ ,  $p = .018$ ) with the mean being 2.12 vehicles ( $sd = 1.27$ ). Scheffe's post-hoc analysis did not identify any specific differences between the regions, although inspection of the means suggests that more vehicles were available in regional households when compared with metropolitan households. In metropolitan Queensland there was a mean of 1.94 vehicles ( $sd = 1.39$ ) available for learners to use while in metropolitan New South Wales there was a mean of 1.93 vehicles ( $sd = .96$ ). In regional Queensland there was an average of 2.31 vehicles ( $sd = 1.39$ ) compared with 2.37 vehicles ( $sd = 1.19$ ) in regional New South Wales.

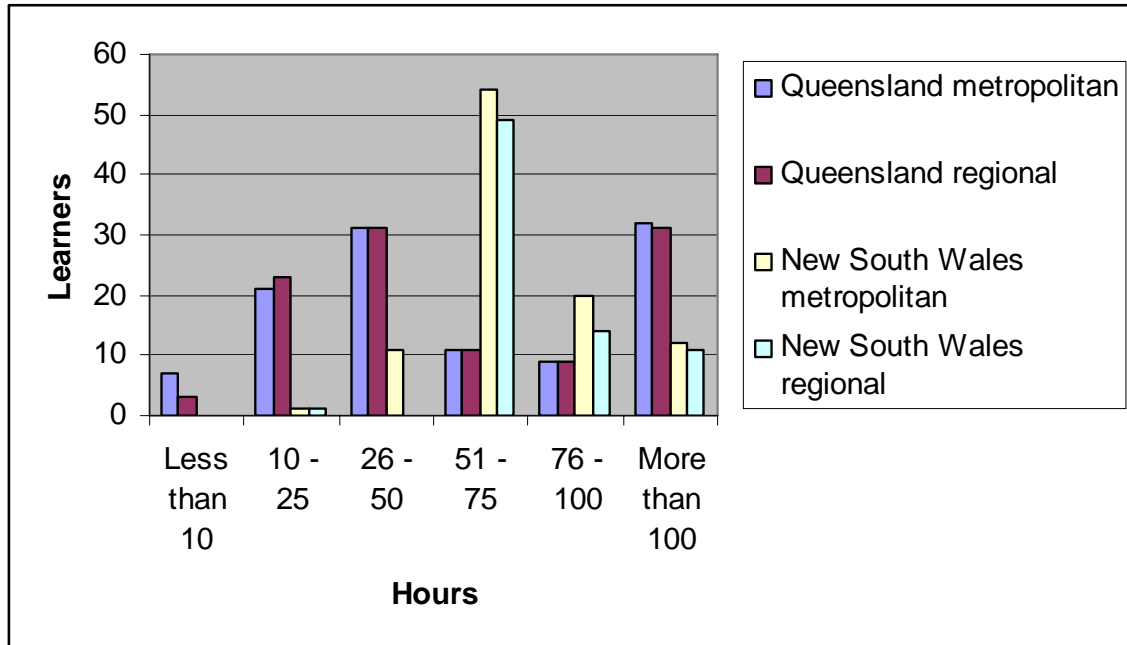
## 4.2.2 Amount of supervised practice

Learners in the Queensland metropolitan area reported completing an average of 65.19 hours of practice ( $sd = 57$ ), while those in the Queensland regional area completed an average of 63 hours ( $sd = 44.41$ ). This was less practice than learners in the New South Wales metropolitan ( $M = 71.38$ ,  $sd = 26.8$ ) and New South Wales regional areas ( $M = 75.83$ ,  $sd = 31.91$ ). When asked if they had completed 50 hours of supervised practice almost all participants from New South Wales indicated that they had ( $N = 169$ , 98.8 per cent). Two participants said that they did not complete this amount of practice (1.2 per cent).

Figure 9 below provides an indication of how supervised practice is structured across geographic location. The figure suggests that practice in Queensland is structured bi-modally with two main

groups of learners. The first group obtains less than 50 hours practice while the second group obtains over 100 hours of practice. In comparison the practice obtained by learners in New South Wales appears to cluster in the 51 to 75 hours bracket.

**Figure 9: Categories of supervised practice by geographic location**



As shown in Table 5, a chi-square analysis compared categories of the hours of supervised practice completed by geographic location. The chi-square found that there was a statistically significant difference in the amount of supervised practice that was undertaken ( $X^2(3) = 92.74, p < .001$ ) with participants in New South Wales more likely to complete 50 hours or more of supervised practice than the learners in Queensland.

**Table 5: Categories of supervised practice by geographic location**

Number of hours	QLD metro	QLD regional	NSW metro	NSW regional	Total
50 hours or less	$n = 59$ (53.2%)	$n = 57$ (52.8%)	$n = 12$ (12.2%)	$n = 1$ (1.3%)	$n = 129$ (32.9%)
51 hours or more	$n = 52$ (46.8%)	$n = 51$ (47.2%)	$n = 86$ (87.8%)	$n = 74$ (98.7%)	$n = 263$ (67.1%)

To further examine the chi-square results, a one-way ANOVA was completed. In contrast with the chi-square results, the ANOVA found that there was no significant difference between the geographic locations when the amount of total practice was considered ( $F(3, 387) = 1.69, p = .690$ ). The amount of time that learner drivers spent with private supervisors was statistically different across the regions ( $F(3, 386) = 4.08, p = .007$ ) as was as the amount of time that learners spent with professional instructors ( $F(3, 387) = 4.76, p = .0013$ ). The Scheffe post-hoc analysis found that drivers in metropolitan Queensland were more likely to use a professional instructor than drivers in regional New South Wales. Drivers in regional New South Wales were more likely to complete more hours of practice with a private supervisor than both metropolitan and regional Queensland drivers.

### 4.2.3 Self-reported behaviours and experiences while on a learner licence

A one way ANOVA was conducted to identify if there was any difference in the behaviours that learner drivers reported engaging in based on geographical location. Learners were able to rate whether or not they engaged in these behaviours on a scale from one (never) to seven (always). Table 6 displays the results of these ANOVAs.

**Table 6: Self-reported behaviours while driving on a learner licence**

Behaviour	Number	Significance
<i>Displayed L plates</i>	$N = 392 (M = 6.42, sd = 1.37)$ QLD metro $n = 111 (M = 6.08, sd = 1.71)$ QLD regional $n = 106 (M = 6.12, sd = 1.73)$ NSW metro $n = 98 (M = 6.91, sd = .35)$ NSW regional $n = 75 (M = 6.73, sd = .62)$	$F (3,388) = 10.1, p < .001$
<i>Did not drive over speed limit in 60km/hr zones</i>	$N = 392 (M = 6.25, sd = 1.14)$ QLD metro $n = 111 (M = 6.15, sd = 1.29)$ QLD regional $n = 108 (M = 6.49, sd = .86)$ NSW metro $n = 98 (M = 6.08, sd = 1.13)$ NSW regional $n = 75 (M = 6.24, sd = 1.24)$	$F (3,388) = 2.6, p = .05$
<i>Did not drive over speed limit in 100km/hr zones</i>	$N = 389 (M = 6.53, sd = 1.1)$ QLD metro $n = 109 (M = 6.48, sd = 1.25)$ QLD regional $n = 108 (M = 6.68, sd = .85)$ NSW metro $n = 97 (M = 6.53, sd = 1.09)$ NSW regional $n = 75 (M = 6.41, sd = 1.18)$	$F (3,385) = 1, p = .391$
<i>Wore seat belt</i>	$N = 389 (M = 6.99, sd = .16)$ QLD metro $n = 110 (M = 7.00, sd = 0)$ QLD regional $n = 108 (M = 6.97, sd = .29)$ NSW metro $n = 97 (M = 7.00, sd = 0)$ NSW regional $n = 74 (M = 6.99, sd = .12)$	$F (3,385) = .72, p = .539$
<i>Did not drive under the influence of illegal drugs</i>	$N = 389 (M = 6.84, sd = .9)$ QLD metro $n = 110 (M = 6.74, sd = 1.15)$ QLD regional $n = 108 (M = 6.94, sd = .5)$ NSW metro $n = 97 (M = 6.88, sd = .86)$ NSW regional $n = 74 (M = 6.80, sd = 1.01)$	$F (3,385) = .99, p = .398$

<i>Did not drive under the influence of legal drugs</i>	$N = 389 (M = 6.83, sd = .89)$	$F (3,385) = 1.68, p = .17$
QLD metro	$n = 110 (M = 6.75, sd = 1.15)$	
QLD regional	$n = 108 (M = 6.99, sd = .1)$	
NSW metro	$n = 97 (M = 6.79, sd = .92)$	
NSW regional	$n = 74 (M = 6.77, sd = 1.01)$	
<i>Allowed 2 seconds between my car and the car in front on highways</i>	$N = 384 (M = 6.29, sd = 1.12)$	$F (3,380) = .639, p = .591$
QLD metro	$n = 108 (M = 6.27, sd = 1.31)$	
QLD regional	$n = 105 (M = 6.41, sd = 1.04)$	
NSW metro	$n = 97 (M = 6.26, sd = .94)$	
NSW regional	$n = 74 (M = 6.19, sd = 1.14)$	
<i>Did not drink alcohol before driving</i>	$N = 389 (M = 6.83, sd = .88)$	$F (3,385) = 1.54, p = .204$
QLD metro	$n = 111 (M = 6.74, sd = 1.14)$	
QLD regional	$n = 107 (M = 6.98, sd = .14)$	
NSW metro	$n = 97 (M = 6.78, sd = .93)$	
NSW regional	$n = 74 (M = 6.28, sd = .98)$	
<i>Completed log book each time I drove</i>	$N = 390 (M = 3.21, sd = 2.49)$	$F (3,386) = 159.26, p < .001$
QLD metro	$n = 111 (M = 1.75, sd = 1.86)$	
QLD regional	$n = 107 (M = 1.4, sd = 1.34)$	
NSW metro	$n = 97 (M = 5.14, sd = 1.74)$	
NSW regional	$n = 75 (M = 5.47, sd = 1.73)$	

Several of the results in the table above appear to reflect a ceiling effect. A ceiling effect occurs when the dependent measure is unable to fully capture the range of responses provided by participants above a certain level (Mitchell & Jolley, 1996). The ceiling effect can be seen in the questions relating to speeding, wearing a seat belt, driving under the influence of both illegal and legal drugs and drinking alcohol before driving. In all these instances the mean response exceeded six, indicating that the participants tended to comply with the relevant laws all the time.

The ANOVA found a statistically significant difference in two behaviours – the tendency to display L plates ( $F (3,388) = 10.10, p < .001$ ) and completion of a log book of hours of practice ( $F (3,386) = 159.26, p < .001$ ). The post-hoc analysis revealed that drivers in New South Wales were more likely than drivers in Queensland to display L plates and were also more likely to complete a logbook while on their learner licence.

The relatively low use of logbooks by learner drivers in Queensland may partially be explained by its voluntary nature. Over two-thirds of the Queensland drivers ( $n = 147, 67.7$  per cent) stated that they were unaware that Queensland had a voluntary logbook.

A chi-square test was conducted to compare how often learner drivers in each geographic location experienced various situations while learning to drive. These situations included driving to and from activities that the participant would have attended anyway, making special trips for the purposes of practising with either a professional or private instructor as well as deliberately practising driving in

the rain, with passengers or at night. Participants were able to respond by answering in the following categories: 'not at all', '1-2 times a month', '3-4 times a month', '5-6 times a month', '7-8 times a month', '9-10 times a month' or 'over 10 times a month'. In order to ensure the chi-square analysis assumptions were met, these categories were collapsed to '1-2 times a month or less', 'between 3 and 8 times a month' and 'more than 9 times a month'. Appendix D displays the results of the chi-square analysis.

The data in Appendix D illustrates the types of practice that the participants reported undertaking while on a learner licence. Almost half of the sample (49 per cent) reported that they drove to or from activities that they would have attended anyway more than eight times a month. The sample reported that they drove their parents (41.1 per cent) or their siblings and friends (56.4 per cent) to and from their activities far less frequently (less than three times a month). Almost half of the sample (48.8 per cent) made trips with a professional instructor on a moderately frequent basis of three to eight times per month. This contrasts with 52.6 per cent of the sample that made special trips with their private instructor nine or more times a month. A substantial proportion of the participants (45.8 per cent) deliberately practised driving in the rain less than three times per month. A similar amount of the sample (44.8 per cent) deliberately practised driving with passengers less than three times per month. A substantial proportion of the sample (39.6 per cent) deliberately practised driving at night on a more frequent basis, three to eight times per month. This was also the frequency with which 43.5 per cent of the sample deliberately practised driving on the weekends. However, 49.9 per cent of the sample deliberately practised their driving on weekdays nine or more times per month.

All of the chi-squares, except one, are significant indicating that the experiences of learner drivers differ by geographic location. It appears that learner drivers in metropolitan Queensland are less likely than learners in other regions to deliberately structure their learning as they report driving to and from activities less than three times per month (52.5 per cent), making two or fewer trips with a private instructor (42.9 per cent), driving in a central business district for practise (43.8 per cent), in rural areas (40.2 per cent), in the rain (40.2 per cent), with passengers (35.4 per cent), at night (41 per cent), or on weekends (54.8 per cent). There were no differences between the four locations regarding the number of times that learner drivers drove their siblings and/or friends to and from activities that they would have attended anyway.

### 4.3 Perception of risk

Each participant was asked on a scale of one (not very risky) to five (very risky) how risky they believed driving was when they first started to learn to drive and how risky they believed it was now, after they had passed their practical driving test. The mean perception of risk for the sample at the start of the learner period was 3.89 ( $sd = 1.31$ ). This means that the sample believed that driving was risky. This perception of risk fell by the time that the participants passed the practical driving test to 3.37 ( $sd = 1.23$ ). A paired sample t-test, was used to identify if the participants risk perceptions changed over time. The analysis found that a significant reduction in the participants perceived risk from when they commenced learning to after they had passed the driving test ( $t(390) = -6.11, p < .001$ ).

An ANOVA was conducted to identify if there was any difference in the perception of risk based on the four geographical locations. No significant difference was found, for either the risk when the learners first started to learn ( $F(3,387) = 1.32, p = .266$ ), or after they passed their practical driving exam ( $F(3,388) = 2.08, p = .102$ ).

**Table 7: Self-reported perception of risk**

Perception of risk	Number	Significance
<i>Start of learner period</i>	$N = 391 (M = 3.89, sd = 1.31)$	$F (3,387) = 1.32, p = .266$
QLD metro	$n = 111 (M = 4.07, sd = 1.25)$	
QLD regional	$n = 108 (M = 3.78, sd = 1.52)$	
NSW metro	$n = 97 (M = 3.76, sd = 1.17)$	
NSW regional	$n = 75 (M = 3.95, sd = 1.26)$	
<i>After passing practical test</i>	$N = 390 (M = 3.37, sd = 1.23)$	$F (3,388) = 2.08, p = .102$
QLD metro	$n = 111 (M = 3.41, sd = 1.34)$	
QLD regional	$n = 106 (M = 3.52, sd = 1.23)$	
NSW metro	$n = 98 (M = 3.11, sd = 1.16)$	
NSW regional	$n = 75 (M = 3.44, sd = 1.13)$	

#### 4.4 Self-reported offence and crash involvement

Very few participants reported that they had been caught committing a driving offence or had been involved in a crash while on their learner's licence. Five per cent of the sample ( $n = 20$ ) said that they were caught committing a driving offence while on their learner licence while six per cent of the sample ( $n = 22$ ) said that they were involved in a crash. Given the small numbers of individuals involved, no further analyses was undertaken.

When asked if they had nearly crashed while driving on their learner's licence, 95 participants reported that they had nearly crashed with an average of 1.72 near crashes ( $sd = .10$ ) reported. As shown in Table 8, an ANOVA test found that there was a difference in the number of near misses between the study locations ( $F (3,91) = 3.67, p = .015$ ) with a post-hoc test finding that learners in metropolitan New South Wales ( $M = 2.22, sd = 1.37$ ) were more likely to report nearly crashing than those in metropolitan Queensland ( $M = 1.44, sd = .71$ ).

**Table 8: Self-reported near misses while on a learner licence**

Near misses	Number	Significance
	$N = 95 (M = 1.72, sd = .10)$	$F (3,91) = 3.67, p = .015$
QLD metro	$n = 25 (M = 1.44, sd = .71)$	
QLD regional	$n = 24 (M = 1.50, sd = .78)$	
NSW metro	$n = 27 (M = 2.22, sd = 1.37)$	
NSW regional	$n = 19 (M = 1.63, sd = .68)$	

#### 4.5 Impacts on the learner phase

A series of analyses were conducted to identify which personal, social and socio-demographic factors impacted on elements of the learner phase including hours of practice, unsupervised driving, number of attempts to pass the learner and provisional tests, difficulty in obtaining supervised practice, type of licence obtained, display of L plates and type of practice undertaken.

### 4.5.1 Total hours of practice

A multiple regression analysis was conducted to assess whether factors such as gender, age, marital status, income level, level of education, participation in the workforce and number of vehicles available in the household impacted on the amount of practice learners undertook. To facilitate the analysis, the variables age, income, parental income, level of education, education of father, education of mother, still studying, whether or not the learner held a job, whether or not the learner worked part time or full time and location were recoded into dichotomous variables. Age was recoded to two groups, 20 years and under as well as 21 years or older. The income of the learner was classified as either \$20 000 or less or \$20 001 and over. The income of parents was divided into \$50 000 or less and \$50 001 and over. The level of education for learners, their mothers and their fathers was categorised as either completing high school (or lower) or completing a qualification post high school. The location was reclassified as Queensland and New South Wales.

As shown in Table 9, none of these factors predicted the total hours of practice that learners reported ( $R^2 = .088$  ( $F(10) = 1.23$ ,  $p = .28$ )). Table 9 also reports the point biserial correlations between the various independent variables.

**Table 9: Standard multiple regression of socio-demographic factors on total hours of practice (HP) reported by learners**

Variable	B	$\beta$	$sr^2$
Gender	-10.63	8.82	.01
Studying	-8.31	11.69	.00
Work full or part time	8.56	11.43	.00
Age	17.87	12.08	.02
Income	.30	13.9	.00
Parent income	3.03	11.64	.00
Education level	-16.27	13.01	.01
Father's education	-19.26	9.88	.03
Mother's education	5.93	9.55	.00
State	15.66	9.31	.02

$R^2 = .088$  ( $F(10) = 1.23$ ,  $p = .28$ ); \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

The number of vehicles available in the household for the learner to use while learning to drive did have an impact on the hours of practice completed ( $R = .163$ ,  $p = .001$ ). Learners who had greater access to vehicles within their household were more likely to have completed a greater number of hours of practice.

### 4.5.2 Hours of unsupervised practice

Nearly 15 per cent of the sample drove unsupervised while on a learner licence. The mean number of hours of unsupervised driving was 1.65 ( $sd = 10.39$ ). However, this included an outlier of one person who drove 100 hours unsupervised. When this individual was removed, the mean number of hours was .63 hours or 37.8 minutes ( $sd = 2.79$  hours). A regression analysis did not identify any significant predictors of the reported hours of unsupervised practice (see Table 10).

**Table 10: Standard multiple regression of socio-demographic factors on hours of unsupervised practice**

Variable	B	$\beta$	$sr^2$
Gender	.46	1.61	.00
Studying	.18	2.13	.00
Work full or part time	.62	2.09	.00
Age	.60	2.21	.00
Income	.51	2.54	.00
Parent income	1.06	2.13	.00
Education level	-1.62	2.38	.00
Father's education	2.58	1.80	.02
Mother's education	1.44	1.74	.00
State	-1.63	1.70	.00

$R^2 = .035$  ( $F(10) = .46, p = .92$ ); \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### 4.5.3 Attempts to pass the learner theory test

Approximately half of the sample (51 per cent) passed the learner theory test on the first attempt. As the number of attempts to pass the theory test was highly skewed, a logistical regression was run to assess which socio-demographic variables predicted the number of attempts learner drivers made. The number of attempts was recoded into a dichotomous variable with either one attempt or two or more attempts as the two levels. As shown in Table 11, the only variable that predicted the number of attempts to pass the learner theory test was the state of the participants.

**Table 11: Logistic regression of socio-demographic factors on attempts to pass the learner theory test**

Variables	B	$\beta$	OR	Lower CI	Upper CI
Gender	.41	.38	1.51	.72	3.17
Studying	.34	.51	1.41	.52	3.83
Work full or part time	.20	.49	1.22	.47	3.2
Age	-.39	.52	.67	.22	1.88
Income	-.13	.60	.88	.27	2.87
Parent income	-.41	.51	.66	.25	1.79
Education level	.34	.57	1.4	.46	4.25
Father's education	-.44	.42	.65	.28	1.48
Mother's education	.22	.41	1.25	.56	2.78
State	-1.13	.41*	.32	.15	.72

$X^2(10) = 14.03, p = .171$  \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

A chi-square test revealed that learners in New South Wales were more likely to sit the test once while those in Queensland were more likely to sit it two or more times ( $X^2(1) = 21.4, p = .001, \phi = -.23$ ). In New South Wales, 64 per cent of learners reported passing the learner theory test on the first attempt and 36.1 per cent on the second or subsequent attempt. In Queensland, 40.4 per cent passed the learner theory test on the first attempt and 59.6 per cent on the second or subsequent attempt. Individuals living in Queensland sat the test an average of 1.59 times ( $sd = .49$ ) while those in New South Wales at the test an average of 1.36 times ( $sd = .48$ ),



#### 4.5.4 Attempts to pass the provisional practical test

Most participants (63.3 per cent) passed the practical driving test to obtain their provisional licence on the first attempt. The average number of attempts made was 1.5 ( $sd = 0.8$ ). A logistic regression was conducted to identify which factors predicted the number of attempts made by learner drivers to pass the provisional practical driving tests. This analysis indicated that gender was the only significant predictor of the number of attempts that learners made to pass this test.

**Table 12: Logistic regression of socio-demographic factors on attempts to pass the provisional practical driving test**

Variables	B	$\beta$	OR	Lower CI	Upper CI
Gender	1.13	.43**	.31	1.33	7.18
Studying	.50	.52	3.09	.59	4.4
Work full or part time	-.52	.53	1.65	.21	1.67
Age	-.67	.60	.59	.16	1.67
Income	.29	.64	.51	.39	4.66
Parent income	.64	.56	1.34	.63	5.72
Education level	.04	.61	1.9	.32	3.44
Father's education	-.84	.45	1.04	.18	1.04
Mother's education	-.57	.44	.43	.24	1.33
State	.36	.44	.56	.61	3.35

$X^2(10) = 20.18, p = .028$  \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

A chi-square, while not statistically significant, indicated that males were more likely to pass the practical driving test to obtain their provisional licence on their first attempt ( $X^2(1) = 3.59, p = .06, \phi = .1$ ) with 67.8 per cent of males reporting that they passed this test on the first attempt. Of the females within the study, 58.5 per cent passed this test on the first attempt.

#### 4.5.5 Difficulty in obtaining supervised practice

A standard multiple regression analysis was conducted to identify which socio-demographic factors predicted the difficulty in obtaining supervised practice. The difficulty of obtaining supervised practice was measured by asking participants how difficult they found it to obtain supervised practice on a scale of five from very difficult to very easy. As shown in Table 13, gender was the only significant predictor of the independent variable.

Males reported that it was easier to obtain supervised practice than females ( $t(383) = 4.57, p = < .001$ ). On a scale of one (very difficult) to five (very easy), the average male difficulty reported was 3.42 ( $sd = 1.34$ ) while the average female difficulty was 2.79 ( $sd = 1.39$ ).

**Table 13: Standard multiple regression of socio-demographic factors on difficulty in obtaining supervised practice**

Variable	B	$\beta$	$sr^2$
Gender	-.75	.24**	.07
Studying	.13	.31	.00
Work full or part time	.22	.31	.00
Age	-.31	.32	.00
Income	-.44	.37	.00
Parent income	.16	.31	.00
Education level	-.11	.35	.00
Father's education	-.52	.27	.03
Mother's education	.31	.26	.01
State	.11	.25	.00

$R^2 = .156$  ( $F(10) = 2.29, p = .017$ ); \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

#### 4.5.6 Type of provisional licence obtained

A logistic regression was conducted to identify which factors predicted whether the participants obtained a manual or automatic provisional licence. The regression identified that gender, parent income, father's education and the state of residence were significant predictors of the dependent variable.

**Table 14: Logistic regression of socio-demographic factors on the type of provisional licence obtained**

Variables	B	$\beta$	OR	Lower CI	Upper CI
Gender	1.35	.47**	3.85	1.54	9.62
Studying	-.30	.62	.74	.22	2.47
Work full or part time	.12	.60	1.13	.35	3.69
Age	1.08	.62	2.95	.88	9.86
Income	1.79	.80	6.01	1.27	28.56
Parent income	-1.21	.61*	.30	.09	.99
Education level	.23	.65	1.26	.35	4.51
Father's education	-1.29	.56*	.28	.09	.82
Mother's education	.83	.52	2.30	.83	6.37
State	1.88	.52***	6.58	2.4	18.05

$X^2(10) = 55.26, p < .001$  \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Four chi-squares were conducted to further examine the significant predictors of the type of provisional licence obtained. As shown in Table 15, males (61.1 per cent) were more likely to obtain a manual licence than females (54.5 per cent;  $X^2(1) = 9.5, p = .002, \phi = .16$ ). Individuals with parents who earn less than \$50,000 per annum were more likely to obtain an automatic licence (80 per cent,  $X^2(1) = 12.84, p = <.001, \phi = .217$ ). Learners in New South Wales were more likely to obtain an automatic licence (63.6 per cent) while those in Queensland were more likely to obtain a manual licence (65.6 per cent,  $X^2(1) = 32.95, p = <.001, \phi = .29$ ). In contrast with the logistical regression, the chi-square did not find that the level of education that the learner's father had completed was significant.

**Table 15: Factors predicting the type of provisional licence obtained**

<b>Predictor</b>	<b>Manual</b>	<b>Automatic</b>	<b>Total</b>	<b>Significance</b>
<i>Gender</i>	<i>n</i> = 206	<i>n</i> = 185	<i>N</i> = 391	
Male	<i>n</i> = 110 (61.1%)	<i>n</i> = 70 (38.9%)	<i>n</i> = 180 (100%)	$X^2(1) = 9.5, p = .002$ $\phi = .16$
Female	<i>n</i> = 96 (45.5%)	<i>n</i> = 115 (54.5%)	<i>n</i> = 211 (100%)	
<i>Parent income</i>	<i>n</i> = 85	<i>n</i> = 86	<i>N</i> = 171	
< \$50,000	<i>n</i> = 6 (20%)	<i>n</i> = 24 (80%)	<i>n</i> = 30 (100%)	$X^2(1) = 12.84,$ $p = <.001$ $\phi = -.217$
> \$50,001	<i>n</i> = 79 (56%)	<i>n</i> = 62 (44%)	<i>n</i> = 141 (100%)	
<i>Level of education completed by father</i>	<i>n</i> = 196	<i>n</i> = 180	<i>N</i> = 391	
Some/all high school	<i>n</i> = 59 (50%)	<i>n</i> = 59 (50%)	<i>n</i> = 118 (100%)	$X^2(1) = .312,$ $p = .576$ $\phi_c = -.029$
Post high school	<i>n</i> = 137 (53.1%)	<i>n</i> = 121 (46.9%)	<i>n</i> = 258 (100%)	
<i>State</i>	<i>n</i> = 206	<i>n</i> = 185	<i>N</i> = 391	
Queensland	<i>n</i> = 143 (65.6%)	<i>n</i> = 75 (34.4%)	<i>n</i> = 218 (100%)	$X^2(1) = 32.95,$ $p = <.001$ $\phi_c = .29$
New South Wales	<i>n</i> = 63 (36.4%)	<i>n</i> = 110 (63.6%)	<i>n</i> = 173 (100%)	

#### 4.5.7 Display of L plates

A regression analysis was conducted to identify which socio-demographic factors predicted the frequency with which the participants displayed their L plates. An additional factor, whether the learner had driven without a supervisor, was included in this analysis. As shown in Table 16, age, the state the participant lived in and whether or not they had practised without a supervisor were significant predictors of the frequency with which the learner displayed their L plates.

**Table 16: Standard multiple regression of socio-demographic factors on displaying L plates**

Variable	B	$\beta$	$sr^2$
Gender	.40	.23	.02
Studying	-.03	.30	.00
Work full or part time	.17	.30	.00
Age	-.86	.31**	.06
Income	.20	.36	.00
Parent income	.41	.30	.01
Education level	.47	.34	.01
Father's education	-.13	.26	.00
Mother's education	-.04	.25	.00
State	.58	.25*	.03
Practise without supervisor	.88	.30**	.05

$R^2 = .238$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Older participants, those 21 years and over ( $6.09$ ,  $sd = 1.78$ ), were less likely to display their L plates frequently compared to younger learners ( $6.53$ ,  $sd = 1.20$ ,  $t(390) = 2.77$ ,  $p = .006$ ). Learners from New South Wales were more likely to display their L plates frequently ( $6.83$ ,  $sd = .50$ ) than those from Queensland ( $6.10$ ,  $sd = 1.71$ ,  $t(390) = -5.44$ ,  $p < .001$ ). Learners who drove without supervision ( $5.37$ ,  $sd = 2.2$ ) displayed their L plates less frequently than those who always drove with a supervisor ( $6.60$ ,  $sd = 1.08$ ,  $t(390) = -6.63$ ,  $p < .001$ ).

#### 4.5.8 Type of practice

##### ***Driving to and from activities that would have attended anyway***

As shown in Table 17, a logistic regression found that the participants' age and whether they were employed full or part time were significant predictors of the frequency with which they drove to and from activities that they would have attended anyway. Younger learners, those aged 20 years or under ( $5.25$ ,  $sd = 2.05$ ), were more likely than older learners ( $4.13$ ,  $sd = 2.28$ ) to drive to and from activities that they would have attended anyway ( $t(390) = 4.48$ ,  $p < .001$ ). Individuals who worked part time ( $5.35$ ,  $sd = 2.00$ ) reported driving to and from activities they would have attended anyway when compared to individuals who worked full time ( $4.33$ ,  $sd = 2.35$ ,  $t(318) = -4.14$ ,  $p < .001$ ).

**Table 17: Standard multiple regression of socio-demographic factors on driving to and from activities that would have attended anyway**

Variable	B	$\beta$	$sr^2$
Gender	-.32	.37	.00
Studying	.08	.50	.00
Work full or part time	1.01	.48*	.03
Age	-1.57	.51**	.06
Income	-.23	.59	.00
Parent income	.15	.49	.00
Education level	.79	.55	.01
Father's education	-.26	.42	.00
Mother's education	-.08	.40	.00
State	.27	.39	.00

$R^2 = .164$  ( $F(10) = 2.49, p = .009$ ); \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### ***Deliberately practising driving with passengers***

As shown in Table 18, a multiple regression found that age was a significant predictor of the frequency with which learners deliberately practised driving with passengers. Those participants aged 20 years and under ( $2.16, sd = 3.68$ ) were more likely to engage in this behaviour than older learners ( $2.72, sd = 2.11, t(389) = 3.77, p < .001$ ).

**Table 18: Standard multiple regression of socio-demographic factors on deliberately practising driving with passengers**

Variable	B	$\beta$	$sr^2$
Gender	-.63	.38	.02
Studying	-.29	.50	.00
Work full or part time	.16	.49	.00
Age	-1.09	.52*	.03
Income	.34	.60	.00
Parent income	.01	.50	.00
Education level	.10	.56	.00
Father's education	.52	.43	.01
Mother's education	-.04	.41	.00
State	.65	.40	.02

$R^2 = .108$  ( $F(10) = 1.54$ ,  $p = .132$ ); \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### ***Deliberately practising driving at night***

A multiple regression was conducted to identify which socio-demographic factors predicted the frequency with which the participants reported deliberately practising their driving at night. As shown in Table 19, age was the only independent variable that significantly predicted the frequency of deliberately practising their driving at night. Learners aged 20 years and under ( $M = 4.52$ ,  $sd = 2.12$ ) were more likely than older learners ( $M = 3.51$ ,  $sd = 2.01$ ) to engage in this behaviour ( $t(389) = 4.07$ ,  $p < .001$ ).

**Table 19: Standard multiple regression of socio-demographic factors on deliberately practising driving at night**

Variable	B	$\beta$	$sr^2$
Gender	-.58	.35	.02
Studying	-.86	.47	.02
Work full or part time	-.04	.46	.00
Age	-1.21	.48*	.04
Income	-.18	.56	.00
Parent income	.11	.47	.00
Education level	.60	.52	.00
Father's education	.08	.40	.00
Mother's education	.69	.38	.02
State	.65	.37	.02

$R^2 = .189$  ( $F(10) = 2.96$ ,  $p = .002$ ); \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

## **4.6 Provisional licence intentions**

Participants were asked about whether they intended to obey various traffic rules while driving on their provisional licence using a scale of one (very unlikely) to seven (very likely). As can be seen in question 30 in the interview in Appendix B, there were slight variations in questions depending on the road rules used in each state. Table 20 shows the results of the one-way ANOVAs used to identify if there were any statistically significant differences across the study locations.

**Table 20: Novice driver intentions once provisionally licensed**

<b>Behaviour</b>	<b>Number</b>	<b>Significance</b>
<i>Obey provisional speed limit restriction</i>	$N = 171 (M = 5.58, sd = 1.66)$	$F (1,169) = .6, p = .441$
NSW metro	$n = 98 (M = 5.5, sd = 1.68)$	
NSW regional	$n = 73 (M = 5.7, sd = 1.63)$	
<i>Obey speed limit</i>	$N = 218 (M = 6.21, sd = 1.23)$	$F (1,216) = .33, p = .598$
QLD metro	$n = 110 (M = 6.16, sd = 1.08)$	
QLD regional	$n = 108 (M = 6.26, sd = 1.38)$	
<i>Voluntarily limit driving at night</i>	$N = 390 (M = 3.18, sd = 1.95)$	$F (3,386) = 2.54, p = .056$
QLD metro	$n = 110 (M = 3.01, sd = 1.95)$	
QLD regional	$n = 108 (M = 2.96, sd = 1.82)$	
NSW metro	$n = 98 (M = 3.2, sd = 1.98)$	
NSW regional	$n = 74 (M = 3.7, sd = 2.05)$	
<i>Will drive with passengers of own age during the day</i>	$N = 390 (M = 5.28, sd = 1.85)$	$F (3,386) = .725, p = .542$
QLD metro	$n = 110 (M = 5.33, sd = 1.92)$	
QLD regional	$n = 108 (M = 5.06, sd = 1.99)$	
NSW metro	$n = 98 (M = 5.42, sd = 1.6)$	
NSW regional	$n = 74 (M = 5.34, sd = 1.85)$	
<i>Will drive with passengers of own age at night</i>	$N = 390 (M = 5.13, sd = 1.83)$	$F (3,386) = 2.11, p = .099$
QLD metro	$n = 110 (M = 5.11, sd = 1.83)$	
QLD regional	$n = 108 (M = 5.36, sd = 1.83)$	
NSW metro	$n = 98 (M = 5.22, sd = 1.66)$	
NSW regional	$n = 74 (M = 4.69, sd = 2.02)$	
<i>Display P plates</i>	$N = 171 (M = 6.69, sd = .9)$	$F (1,169) = .2, p = .654$
NSW metro	$n = 98 (M = 6.66, sd = .87)$	
NSW regional	$n = 73 (M = 6.73, sd = .95)$	
<i>Display P plates (even though not compulsory)</i>	$N = 218 (M = 1.65, sd = 1.57)$	$F (1, 216) = .1, p = .753$
QLD metro	$n = 110 (M = 1.62, sd = 1.56)$	
QLD regional	$n = 108 (M = 1.69, sd = 1.58)$	
<i>Still tow vehicles even if the law says you can't</i>	$N = 172 (M = 1.51, sd = 1.32)$	$F (1,170) = .02, p = .895$
NSW metro	$n = 98 (M = 1.5, sd = 1.29)$	
NSW regional	$n = 74 (M = 1.53, sd = 1.38)$	

<i>Not drive after a couple of drinks</i>	$N = 388 (M = 6.55, sd = 1.44)$	$F (3,384) = 1.37, p = .253$
QLD metro	$n = 110 (M = 6.44, sd = 1.63)$	
QLD regional	$n = 107 (M = 6.8, sd = 1)$	
NSW metro	$n = 97 (M = 6.6, sd = 1.22)$	
NSW regional	$n = 74 (M = 6.28, sd = 1.84)$	
<i>Will not break road rules even if know won't get caught</i>	$N = 388 (M = 5.61, sd = 1.8)$	$F (3,384) = 1.37, p = .253$
QLD metro	$n = 109 (M = 5.47, sd = 1.82)$	
QLD regional	$n = 107 (M = 5.88, sd = 1.84)$	
NSW metro	$n = 98 (M = 5.43, sd = 1.69)$	
NSW regional	$n = 74 (M = 5.65, sd = 1.84)$	
<i>Obey provisional vehicle power restriction</i>	$N = 171 (M = 6.22, sd = 1.51)$	$F (1,169) = .74, p = .39$
NSW metro	$n = 97 (M = 6.31, sd = 1.36)$	
NSW regional	$n = 74 (M = 6.11, sd = 1.68)$	
<i>Not drive with passengers if lose provisional licence</i>	$N = 169 (M = 6.17, sd = 1.54)$	$F (1,167) = .32, p = .57$
NSW metro	$n = 97 (M = 6.11, sd = 1.54)$	
NSW regional	$n = 72 (M = 6.25, sd = 1.55)$	

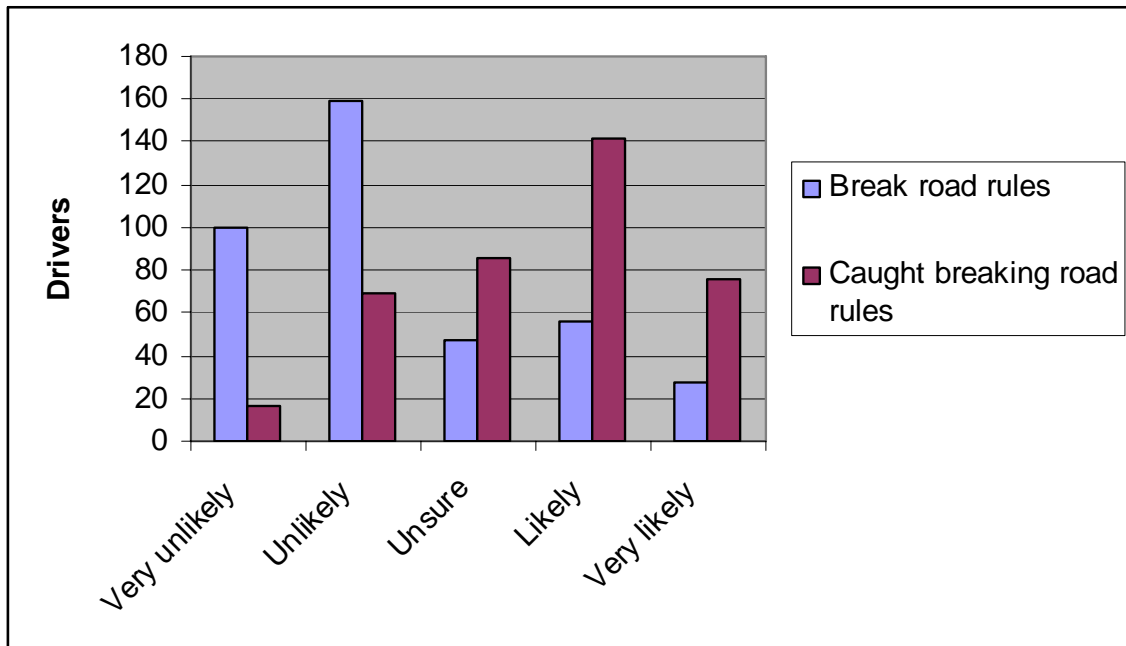
The ANOVAs did not identify any statistically significant differences between the participants from different geographic locations for their intended driving behaviours while on a provisional licence. The mean scores suggest that participants generally intended to obey the laws relating to provisional drivers such as obeying the provisional speed limit restriction in New South Wales ( $M = 5.58, sd = 1.66$ ) and obeying the speed limit in Queensland ( $M = 6.21, sd = 1.23$ ). However, they were less likely to report voluntarily undertaking behaviours recommended to keep them safer such as limiting their driving at night ( $M = 3.18, sd = 1.95$ ).

## 4.7 Perceptions about breaking the road rules

Participants were asked to rank on a scale of one (very unlikely) to five (very likely) if it was likely that they would break the road rules while driving on a provisional licence. They were also asked on the same scale if they were to break the road rules on their provisional licence, how likely it was that they would be caught. A one-way ANOVA revealed that there was no statistically significant difference between geographic locations for either likelihood of breaking the road rules ( $F (3,385) = 1.32, p = .268$ ) or the likelihood of being caught ( $F (3,386) = 1.45, p = .227$ ). As shown in Figure 10, the majority of participants indicated that they believed it was likely that they would be caught if they broke the road rules while driving on a provisional licence. Consistent with this they also indicated that it was unlikely that they would do so.



Figure 10: Intentions regarding breaking the road rules while driving on a provisional licence



## 4.8 Psychosocial influences on driver behaviour and intentions

### 4.8.1 Psychosocial influences on learner driver behaviour

A hierarchical regression was conducted to assess the usefulness of Akers' Social Learning Theory and sensation seeking in predicting learner drivers self reported compliance with the road rules, over and above socio-demographic influences. Accordingly, socio-demographic variables were entered as step one, social learning factors were entered at step two and sensation seeking at step three. The results are shown in Table 21.

**Table 21: Hierarchical regression of socio-demographic factors, Akers' Social Learning Theory and sensation seeking on learner driver adherence to the law**

Variables	B	$\beta$	$sr^2$	$R^2$	Adj $R^2$	Change in $R^2$
<i>Step 1 – Socio-demographic</i>						
Gender	-.32	.88	.00			
Age	-.21	.15	.01			
Studying	.34	1.00	.00			
Income	.90	1.15	.00			
Parent's income	.81	1.06	.00			
Education	-1.10	1.19	.00			
Father's education	1.37	.88	.01			
Mother's education	.77	.85	.00			
State	-1.56	1.04	.01			
				.10	.04	
<i>Step 2 – Social Learning</i>						
Behavioural dimension – parents	.01	.08	.00			
Behavioural dimension – friends	.16	.07*	.02			
Behavioural dimension – others	.09	.09	.01			
Normative dimension	.10	.12	.00			
Personal attitudes	-.40	.23	.02			
Negative reinforcement	.06	.07	.00			
Positive reinforcement	.44	.17*	.04			
				.32***	.23	.22***
<i>Step 3 – Sensation seeking</i>						
	-.10	.03**	.06			
				.37***	.29	.06**

\*  $p = .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

Overall, the model was significant with the socio-demographic variables, Akers' Social Learning Theory variables and sensation seeking accounting for approximately 37 per cent of the variance in self-reported learner driver behaviour.

The first step in the hierarchal regression was not statistically significant ( $F(9) = 1.59, p = .126$ ).

The second step incorporated the Akers' Social Learning Theory variables and was statistically significant ( $F(16) = 3.57, p < .001$ ). The incorporation of this step explained an additional 19 per cent of the variance. The significant predictors within the Akers' Social Learning Theory model were friends within the behavioural dimension ( $\beta = .08, p < .05$ ) and anticipated positive reinforcement ( $\beta = .17, p < .05$ ).

The third step within the model incorporated sensation seeking as a variable and was statistically significant ( $F(17) = 4.28, p < .001$ ). The incorporation of this variable explained an additional six per cent of the variance.

#### **4.8.2 Psychosocial influences on provisional licence intentions**

A hierarchal regression was conducted to assess the usefulness of Akers' Social Learning Theory and sensation seeking in predicting the participants' intentions to drive safely on their provisional licence, over and above socio-demographic influences. Consequently, socio-demographic factors were entered as step one, social learning factors were entered as step two and sensation seeking as step three. The results are shown in Table 22.

Overall, the model was significant with the various variables accounting for approximately 24 per cent of the variance in the participants future driving intentions.

The first step in the regression was not significant ( $F(9) = 1.62, p = .117$ ) with no socio-demographic variables that were significant.

The second step within the regression was statistically significant ( $F(16) = 1.94, p = .023$ ). This step accounted for an additional six per cent of the variance.

The third step within the regression was the inclusion of sensation seeking as a variable. This step was statistically significant ( $F(17) = 2.24, p = .006$ ) and accounted for an additional three per cent of the variance. The sensation seeking variable was a statistically significant predictor ( $\beta = .03, p = < .05$ ).

**Table 22: Hierarchical regression of socio-demographic factors, Akers' Social Learning Theory and sensation seeking on intentions to adhere to the law while on a provisional licence**

Variables	B	$\beta$	$sr^2$	$R^2$	Adj $R^2$	Change in $R^2$
<i>Step 1 – Socio-demographic</i>						
Gender	-.42	.94	.00			
Age	.19	.16	.01			
Studying	1.87	1.08	.02			
Income	-.96	1.24	.00			
Parent's income	-1.53	1.14	.01			
Education	-1.66	1.28	.01			
Father's education	-.63	.94	.00			
Mother's education	.32	.91	.00			
State	.20	1.12	.00			
				.10	.04	
<i>Step 2 – Social Learning</i>						
Behavioural dimension – parents	-.02	.08	.00			
Behavioural dimension – friends	-.03	.08	.00			
Behavioural dimension – others	-.01	.10	.00			
Normative dimension	.23	.12	.02			
Personal attitudes	-.07	.24	.00			
Negative reinforcement	.06	.08	.00			
Positive reinforcement	.29	.18*	.02			
				.20*	.10	.10*
<i>Step 3 – Sensation seeking</i>						
	-.08	.03*	.04			
				.24**	.13	.04*

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

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## 5 DISCUSSION AND CONCLUSIONS

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### 5.1 Learner driver experiences

#### 5.1.1 Obtaining a learner licence

The average number of times that learners across all regions sat the theory test to obtain a learner licence was 1.84 times ( $sd = 1.8$ ). There was no statistical difference identified between the four regions. The only socio-demographic variable that predicted the number of attempts to pass the learner theory test was the state of residency. Participants living in Queensland sat the test an average of 1.59 times ( $sd = .49$ ) while those living in New South Wales sat the test an average of 1.36 times ( $sd = .48$ ).

This difference could be accounted for by a number of factors including differences in the difficulty of the test or policy differences. For instance, the New South Wales licensing system at the time of this study contained more elements than the Queensland system. One of the requirements of the New South Wales system, that was absent in the Queensland system at this time, was the completion of a log book by learner drivers demonstrating that they have completed 50 hours of supervised practice. As a general rule, parents are expected to have a heavy involvement in the supervision of the 50 hours of practice by the learner driver. As a result, parents may expect to be more actively involved in the other parts of the licensing process and help their learner study and revise for the theory test as well.

Alternatively, the New South Wales theory test may be easier to pass than the Queensland theory test. This may be because learners in New South Wales are required to complete other elements of the licensing process that are designed to help them to develop safe driving skills. As Queensland had, at this time, a more streamlined process, there were fewer opportunities to intervene and identify learners that may require assistance. This may account for a theory test that is more difficult. Alternatively, the cost of a test may act as an incentive. In New South Wales, individuals must pay for each attempt they make at the learner theory test.

Gender, age, and income and education levels of both learners and their parents, did not impact on the number of attempts required to pass the learner theory test. This suggests that the learner test is administered in a fair manner that removes any potential biases based on socio-demographic characteristics.

#### 5.1.2 Supervised and mandated hours of practice

The only socio-demographic factor that significantly predicted the amount of practice learners undertook was the number of vehicles present within the household. Having more vehicles available in the household suggests that learners are more likely to access a vehicle when a supervisor is able to teach them. Gender, whether or not the learner was still studying, whether they worked, their age, income, parent's income, education level, the education level of the parents and their state of residency did not predict the amount of practice that a learner would undertake.

The structure of the licensing system appears to influence the amount of supervised practice learners obtain. Although the Queensland and New South Wales licensing systems have many similarities there are some key differences. At the time the study was conducted, learners in New South Wales were required to complete 50 hours of supervised practice and record their learning

experiences in a log book while learners in Queensland had no mandated hours of practice (Senserrick, 2007).

This difference appears to be reflected in the results of the study. Although there was no statistically significant difference when the total number of hours was considered, learners in New South Wales completed more hours on average than those in Queensland. However, the average amount of practice completed was above 50 hours for all geographic regions studied. These results contrast with the findings of Harrison's (2004) research which found that a sample of learner drivers in Victoria completed an average of 20.8 hours over 24 months. This may reflect a number of factors. Harrison's research was a different design involving learner drivers completing a log book of their practice as they proceeded while this study involved learner drivers remembering the total amount of practice and providing this information to the interviewer. This may result in inaccurate reporting by some learners. It may also reflect the fact that there were no mandated hours of practice required by the Victorian authorities at the time of Harrison's study.

When the pattern of hours of practice was examined, rather than just the average amount, a different picture emerged. Almost all of the participants (98.8 per cent) from New South Wales indicated that they had obtained the mandated 50 hours of practice. This is a strong indication that the New South Wales legislation has an impact on the practice obtained by learner drivers. For example, this research also found that learners in New South Wales were more likely than those in Queensland to complete 50 hours of practice. However, there may be an unintended side effect of mandating a set number of hours that are not particularly high, in that it may serve to reduce the overall amount of practice that some learners undertake. It appears that learners in Queensland are clustered into two groups. One group appears to undertake the minimum amount of practice required to pass the test, which is less than 50 hours. The second group tends to complete more than 100 hours. In contrast, drivers in New South Wales were more likely to complete just over the required 50 hours of practice. This supports Foss' (2007) assertion that learners and their parents believe that completing the mandated hours is all that is required to learn the skills required to drive. As a result, policy and legislation makers need to carefully consider the number of hours that are chosen when deciding if and how many hours of practice are mandated.

A log book is used in New South Wales to record the number of hours that learners complete. It is a compulsory part of the licensing system and used to ensure that drivers meet the required 50 hours of supervised practice. As expected, drivers in New South Wales completed their logbook on a more regular basis than those in Queensland. This can be explained by the compulsory nature of the log book in New South Wales and its voluntary nature in Queensland. The voluntary nature also means that many learners in Queensland (67.7 per cent) appear unaware that there is a logbook available. Therefore, a log book is likely to reach its maximum potential as a tool to manage a learner's practice when it is a required part of the driver licensing system. If it is offered as a voluntary tool, it needs to be supported with a program that encourages learners and their parents to use the log book.

### ***Difficulty in obtaining supervised practice***

Mandating a set number of hours of supervised practice for learner drivers does not appear to influence their perceptions of how difficult it is to find time to practice. There was no difference in learner perceptions in the four geographic locations studied. This is encouraging for policy makers who may deliberately reduce the required number of hours when legislating due to a belief that some people will find it difficult to obtain the required hours (Travelsafe Committee, 2003). This at least applies in the case of 50 hours, but may not hold for a higher amount of hours.

Gender was the only socio-demographic variable that predicted the perceived ease of obtaining supervised practice. Males reported finding it easier to practice their driving. The reasons why

males perceive that it easier to practice their driving needs further investigation. However, some possible reasons may include they are more assertive in asking for practice or that parents may perceive that their sons require more practice.

### ***Unsupervised practice***

Nearly 15 per cent of learners participated in some form of unsupervised practice on road. The average amount of unsupervised driving practice was less than an hour. Although the amount of time may be less than one hour, engaging in any unsupervised practice may still be a concern. The analysis did not identify any variables that predicted the likelihood of unsupervised driving.

Participating in an illegal behaviour without being caught or punished during the initial phase of the licensing system may have long term impacts. There is the possibility that this may undermine the deterrent effect of the licensing system and encourage more illegal behaviour. Research into unlicensed driver behaviour concluded that more effective enforcement, particularly the use of routine licence checks, was required to reduce punishment avoidance among unlicensed drivers (Watson, 2004b).

### **5.1.3 Involvement of parents**

Parents are essential in ensuring that learner drivers accrue sufficient supervised practice (Harrison, 2004). This is reflected in the results of this study with learner drivers in regional New South Wales more likely to complete hours of practice with private supervisors while those in metropolitan Queensland were more likely to use a professional driving instructor. In New South Wales, the person who is the primary source of lessons and practice is likely to be a parent. In contrast, learners in Queensland tended to indicate that the person who provided them with the most lessons and practice was a professional driving instructor. This reflects on the requirement for learners in New South Wales to obtain 50 hours of supervised practice. It is probably prohibitively expensive for most individuals and families to obtain 50 hours of practice from a professional driving instructor. As a result, most are forced to use private instructors to obtain the required amount of practice.

Most parents appear supportive of their children during the learn to drive process. Nearly three-quarters of participants from New South Wales indicated that their parents created no difficulties for them in obtaining their 50 hours of supervised practice. This indicates that it is appropriate for authorities to assume that it is a reasonable expectation that parents will help their learner drivers obtain their provisional licence, at least when the limit is 50 hours.

### **5.1.4 Characteristics of supervised learning experiences**

It appears that younger learners have more structured experiences. The younger participants were more likely to practice driving to and from activities that they would have already attended as well as deliberately practice with passengers in the car or by driving at night on a more regular basis. Learners who worked part time were more likely to practise by driving to and from activities that they would have attended anyway. This could be a result of parents having greater control over younger learners. Parents are able to ensure that the types of experiences that they believe are important for their children are undertaken. The reason that learners who work part time practice by driving to and from existing commitments may be related to the fact that they are time poor and have less time to dedicate to obtaining practice.

The experiences of learner drivers differed across geographical areas. Learners in metropolitan New South Wales were more likely to obtain supervised practice by driving their parents, their siblings and/or friends to and from activities that they would have attended anyway. This suggests that

learners in Sydney met the required 50 hours of supervised practice by fitting it in with existing activities rather than making special trips for the purpose of practise. This is a useful strategy to ensure the legislated minimum amount of practice is met. It is also useful to make certain that learners progressively get practice in driving situations that they are likely to meet when they commence solo driving. Policy makers can encourage this as a strategy for parents and their learners.

The results indicate that learners in metropolitan Queensland are less likely to gain deliberate experience in several types of driving. For example, they are less likely to deliberately practise their driving in central business districts, in rural areas, with passengers, at night, on weekends or on weekdays. This suggests that much of their driving occurs on an ad-hoc, unplanned basis. This may be a result of not using a logbook. A logbook may encourage learner drivers and their instructors to structure their learning experiences. It may also facilitate communication between professional and private instructors. Lack of access to public transport and other facilities may encourage a greater focus on obtaining a learner licence in regional Queensland. As a result, learners and their supervisors may plan experiences more thoroughly than those in metropolitan Queensland.

### **5.1.5 Compliance with the road laws as a learner driver**

As expected, learners in both Queensland and New South Wales reported good compliance with the road laws. The vast majority reported that they wore their seat belts, did not drive under the influence of legal or illegal drugs, kept to the speed limit in 60 kilometre per hour and 100 kilometre per hour speed zones, did not drink drive and did not tailgate. This is supported by the fact that very few learners reported that they had been caught breaking the road laws. It is expected that learners would comply with the road laws as they are supposed to be supervised at all times. It is unlikely that a supervising driver would generally allow or encourage a learner driver to break the road laws while trying to teach them how to drive appropriately.

There was a statistically significant difference between the New South Wales and Queensland participants in relation to displaying L plates. Learner drivers in New South Wales were more likely than those in Queensland to display L plates on a regular basis. Displaying L plates has been compulsory in New South Wales for longer than in Queensland. The requirement to display L plates was reintroduced in Queensland at the end of January 2005. Data collection for this study commenced in early 2006. Therefore, some individuals who had held their learner licence for a longer period of time in Queensland would not have been required to display L plates for their entire learner period. This may have influenced the results.

Older learners and learners who practised without a supervisor were less likely to display L plates frequently. Learners who were engaging in unsupervised driving, an illegal activity, would be less likely to display their L plates as it draw attention to the fact that they were unsupervised.

While very few learners reported being involved in a road crash, over one-quarter indicated that they had nearly crashed while on their learner licence. There was no difference in the likelihood of nearly crashing across the geographic locations suggesting that the different learner licence systems have not impacted on near crashes while on a learner licence. This is expected given that the impact of many measures during the learner licence stage such as mandated hours of practice are designed to reduce crashes once learners start driving by themselves on their provisional licence.

## **5.2 Driver education and training**

As discussed in 2.3.1, driver education/ training is another countermeasure that is often used with the aim of equipping new drivers with the skills, knowledge and attitudes that are needed for safe



driving (Mayhew, 2007). However, formal driver education/training courses are not part of the driver licensing systems in either Queensland or New South Wales and it appears that new drivers are most likely to participate in activities that are directly related to obtaining a driver's licence (Bates et al., 2006). This is reflected in the results with very few participants (12.31 per cent) completing a driver education course. Of those who did complete a driver education course, over half were from Sydney (in New South Wales). Despite this, the numbers participating in formal driver education and training in Sydney were still relatively small with only 26.53 per cent of participants from this location completing a course.

The larger numbers of individuals from Sydney participating in formal driver education and training course may be an indication of the availability of education programs. There may be more education programs available in Sydney than in the other areas surveyed. Alternatively, Sydney is the state capital with the largest population. In June 2005, Sydney had 4,255,000 people living in the city. This compares with 1,811,000 people living in Brisbane (Australian Bureau of Statistics, 2007). The larger population makes it more likely that Sydney has a higher number of drivers and vehicles on the road. As a result, learner drivers in Sydney may be more likely to undertake formal education and training as they feel less confident than learners in other areas due to the higher population and registered vehicle numbers. It may also be indicative of the more complex traffic environment in Sydney. Further research is needed to confirm this hypothesis.

## **5.3 The provisional licence**

### **5.3.1 Obtaining a provisional licence**

Most learners (63.3 per cent) obtained their provisional licence on the first attempt at the practical driving test. The logistical regression found that the only socio-demographic factor that significantly predicted the number of attempts that were made to pass the practical driving test was gender. Females were more likely than males to require multiple attempts to pass the test. The state where the learner resided did not predict the number of attempts made to pass the practical driving test.

A number of socio-demographic factors including gender, parental income and the state of residence significantly predicted the type of provisional licence obtained. Females, those who had parents with lower incomes and learners who lived in New South Wales were more likely to obtain an automatic rather than a manual licence. This may reflect a perception that obtaining an automatic licence or driving an automatic vehicle is easier. Individuals who fall into the above socio-demographic categories may be interested in obtaining a driver's licence in the most expedient manner possible and find it easier to obtain an automatic rather than a provisional licence.

### **5.3.2 Provisional licence intentions**

There was no difference based on geographic location for how learner drivers planned to drive after they obtained their provisional licence. Drivers in all locations indicated that they planned to comply with mandated laws such as obeying speed limits and not drink driving. However, they were less likely to intend to comply with recommended actions such as limiting driving at night and displaying non-compulsory P plates.

The way learners intend to drive on their provisional licence may also be influenced by their beliefs regarding the likelihood of being caught. Most participants believed that if they broke the road rules, it was likely that they would be caught. Consistent with this, they also reported that it was unlikely that they would break the road rules. There was no difference based on geographic area.

This indicates the importance of the driver licensing system in shaping driving intentions. One reason that learner drivers intend to obey the road laws while on a provisional licence is because they believe that it is likely that they will be caught breaking the road rules. This supports Foss and Goodwin's (2003) argument that graduated driver licensing systems can be strengthened through effective enforcement. They argue that, due to the difficulties in clearly identifying provisional drivers, this enforcement is more likely to target all drivers rather than focus on provisionally licensed drivers and their specific laws.

## **5.4 Perception of driving risk**

There were no differences across the geographical areas in the participants' perception of driving risk, both at the start of the learner licence and after they passed the practical driving exam. However, learners perceived risk fell from when they commenced driving on their learner licence to when they obtained their provisional licence. This is in direct contrast to research evidence which suggests that the learner licence period has the lowest crash risk (Williams et al., 1997) and may, in part, indicate that the process of obtaining the provisional licence inadvertently contributes to the over-confidence of young drivers.

It appears that learners gain confidence while they practise. While this is a positive finding, it is important that learners do not become overconfident. Overconfidence regarding their abilities and underestimating the risks involved with driving appears associated with increased crash risk (McDonald, 1994). Policy makers, professional driving instructors and parents need to continue to engage learners and highlight the dangers of overconfidence while driving.

## **5.5 Theoretical implications**

Together, the socio-demographic variables, Akers' Social Learning Theory and sensation seeking variables were useful in explaining learner driver behaviour. These factors accounted for approximately 37 per cent of the variance in learner driver behaviour. Akers' Social Learning Theory and sensation seeking explained approximately 14 per cent of the variance regarding learner drivers' intentions to adhere to the law when on a provisional licence.

### **5.5.1 Socio-demographic factors**

Although socio-demographic factors accounted for approximately 10 per cent of the variance in the participants' future driving intentions to adhere to the law, no specific socio-demographic factors were significant.

### **5.5.2 Akers' Social Learning Theory**

Akers' Social Learning Theory predicted approximately 30 per cent of learner driver behaviour with friends as models, the individual's personal attitudes and positive reinforcement being significant predictors. The use of this theory reinforces the importance of friends' influence during the learner licence phase. The research suggests that learners model their behaviour on their friends' driving behaviour, although other shared experiences may partially explain the similarity between the driver behaviour of learners and their friends. This supports the findings of Fleiter, Watson, Lennon and Lewis (2006) who found that the behaviour of friends predicted self-reported speeding.

The role of friends in influencing the behaviour of new drivers may become even more important in the provisional stage. Research has suggested that the presence of certain types of passengers

affects young drivers with young male passengers likely to negatively affect young drivers while young female passengers positively influence young drivers (Simons-Morton et al., 2005).

The behaviour of parents and other drivers did not significantly predict learner driver compliance with road laws. This may be because the driving behaviour of parents may be seen as too different from what learners are required to demonstrate in order to obtain a provisional licence. For instance, the parents of the participants were likely to have been driving for 20 years or more. Therefore, they may drive differently to the current best practice techniques that learners are taught by other people such as professional driving instructors. The behaviour of other drivers on the road may be perceived as being too distant from the learner driver and they therefore do not internalise or imitate these behaviours.

Akers' argues that personal attitudes are learnt through interacting with significant groups (Akers et al., 1979). This supports the concept that the behaviours of learners are strongly influenced by others through shared social norms and attitudes. It may also be a reflection of learners being focussed obtaining their licence. Learners may learn these shared social norms and attitudes from individuals that they believe are important to them when learning to drive.

Learner drivers are also more likely to comply with road laws when they are rewarded for doing so. As learner drivers must drive with a supervisor, the provision of a reward is likely to be immediate and be provided in a concrete form such as praise from a professional driving instructor. This is consistent with other research that has found positive reinforcement predicts other types of driving behaviour such as speeding (Fleiter & Watson, 2005). Positive reinforcement was the only Akers' Social Learning Theory factor that predicted differences in learner drivers' intentions to adhere to the law when they drive on their provisional licence.

### **5.5.3 Sensation seeking**

The inclusion of sensation seeking significantly accounted for additional variance in self-reported current and intended adherence to the law over and above the socio-demographic and social learning variables. Other research has discussed how a range of factors, over and above personal attitudes, impact on driving behaviours such as speeding (Fleiter & Watson, 2005). As noted in the literature review, young people aged 16 to 19 years have the highest rates of sensation seeking (Williamson, 1999). Including sensation seeking as a variable when explaining the behaviour of newly licensed drivers, who are generally aged from 16 to 19 years, is important because it explains a greater proportion of the variance in novice driver behaviour.

Sensation seeking was a significant factor in predicting learner driver compliance with road laws (explaining an additional 6 per cent of the variance) and their future driving intentions (explaining an additional 4 per cent of the variance). The significance of sensation seeking as a variable suggests that while learner drivers model the behaviour of their friends and shared norms and attitudes, they are still strongly influenced by the desire to engage in new and intense experiences. Learners are still strongly influenced by the presence of an older and more experienced driver, once this presence is removed and they commence driving unsupervised, their desire to seek new experiences becomes more important. Further research that examines the factors that influence the provisional licence phase (see 5.7.1 below) is needed to confirm this hypothesis.

## **5.6 Countermeasure implications**

### **5.6.1 Mandating supervised practice**

The structure of the licensing system inevitably influences the expectations and experiences of drivers and their parents and supervisors. While mandating a set number of hours of supervised practice for learner drivers helps to ensure that the majority of individuals obtain a minimum level of driving experience, there is some evidence that it may, at least based on the 50 hours requirement, reduce the amount of supervised practice obtained by some individuals. Without the mandated practice requirement, these individuals would possibly have gained significantly more hours of practice. Therefore, licensing authorities need to consider the number of hours that they require as a mandated level. If they are unable to mandate a sufficient number of hours, there may be negative effects setting a lower limit.

If driver licensing authorities require a large amount of supervised hours of practice before a learner can obtain a provisional licence, the length of the learner period may need to be increased. This study did not identify any differences in the perceived difficulty in obtaining supervised practice between learner drivers who were subject to the requirement of obtaining a minimum 50 hours of practice and those who were not subject to this restriction. However if licensing authorities require larger amounts of supervised practice, for instance, 100 hours, they may need to lengthen the licence period in order to facilitate this practice (which has come about to some degree with Queensland allowing individuals to obtain their learner licence at 16 years and their provisional licence at 17 years).

### **5.6.2 Use of logbooks**

In cases where they have not already been implemented, authorities could consider introducing compulsory logbooks to help learners and their supervisors structure supervised practice. This may be a useful tool even without a set number of hours of practice being mandated. This research found that learners in metropolitan Queensland, where log books are not compulsory, were less likely to deliberately practise their driving in a range of situations such as in central business districts, in rural areas, with passengers, at night, on weekends or on weekdays suggesting that much of their practise occurs on an ad-hoc basis. A requirement to complete a logbook, before learners are able to attempt the practical driving test to obtain their provisional licence, may encourage them to practice more effectively. It may also facilitate communication between learners and their supervisors. The completion of the log book would need to be compulsory as this research has shown that with voluntary completion more than two-thirds of learners are unaware that the log book exists.

### **5.6.3 Driver education and training**

It appears, from this research, that learners are less likely to participate in driver education/training programs without incentives being present in the licensing system. However before amending GDL systems, licensing authorities need to consider whether participating in education and training is likely to enhance the safety of novice drivers once they commence solo driving. Given that the benefits of formal driver education and training are still to be confirmed, authorities may need to wait before altering GDL systems to encourage participation in these programs.

### **5.6.4 Perception of driving risk on a provisional licence**

This research demonstrated that the confidence of learners increases from when they first obtain

their learner licence to when they obtain their provisional licence. Although this issue relates more to provisional drivers, as overconfidence in driving abilities may contribute to increased crash risk, policy makers need to engage with learners and their parents to help develop strategies that increase the perception of driving risk among learners.

## **5.7 Research priorities**

This research has contributed to our understanding of learner driver behaviour, and the factors that influence this behaviour, in two Australian states. However, further research would enhance our knowledge regarding graduated driver licensing processes and outcomes.

### **5.7.1 Provisional licence phase**

This research focussed on the first phase of the graduated driver licensing system, the learner licence. However GDL systems, including those in Queensland and New South Wales, typically involve three phases: learner, provisional and open (Williams & Mayhew, 2003). Each of these stages is important in meeting the goal of GDL by gradually exposing new drivers to risky situations. To enhance our knowledge of the operation of GDL within Australia, further research is required regarding the experiences of drivers during the provisional licence phase.

It would be particularly interesting to examine the experiences of provisionally licensed drivers in Australian states. This is because the provisional licence in Australia operates differently to those in practice overseas in places such as North America. Jurisdictions in North America use restrictions such as limits on night driving or peer passengers, which have been shown to be effective in reducing crashes for newly licensed drivers (Lin & Fearn, 2003). These restrictions are not present in the same form in Australia which tend to use a combined night driving and passenger restriction or apply the restriction as a penalty after the provisional driver has lost their licence. Further research will provide greater understanding of how effective the provisional licence is as part of a graduated driver licensing system without these types of restrictions.

This study has demonstrated the usefulness of Akers' Social Learning Theory and sensation seeking in explaining learner driver behaviour. Further research will help identify if these theories continue to predict new driver behaviour in other stages of the licensing process. For instance, research could identify if parents continue to operate as an important influence on new drivers as they progress through the licensing system. The impact of parents may not be as significant during the provisional licensing phase when parents are not as likely to be present in the vehicle while the learner is driving.

### **5.7.2 Involvement of parents**

This study has focussed on learner driver experiences from their perspective. As demonstrated in this study, parents are heavily involved in the provision of lessons and practice for learners during this time. However, the socio-demographic characteristics of parents, such as their income or education level, have a limited impact on learner phase activities. Therefore, further research is needed to explore the contributions that parents make to learner driver experiences. This is particularly the case when some GDL systems such as the New South Wales system (and more recently Queensland) explicitly encourage the involvement of parents during the learner phase (Simons-Morton & Ouimet, 2006) through countermeasures such as mandating a set number of hours of supervised practice.

Further research could examine what facilitates and inhibits parental involvement. As shown in this study, nearly three-quarters of participants from New South Wales stated that their parents did not make it difficult for them to obtain supervised practice. Further research would help identify what makes it difficult for the remaining 25 per cent of parents to provide support in the form of supervised practice for learner drivers.

### **5.7.3 Evaluation of changes to the learner license phase**

GDL systems are constantly evolving and developing. It is important to evaluate these developments in order to assess whether they are enhancing the existing system. Queensland and New South Wales are in the process of introducing changes into their licensing systems. These changes will affect the learner phase and include:

Queensland

- Lowering the minimum learner age from 16 ½ years to 16 years;
- Requiring 100 hours of supervised practice; and
- Banning all forms of mobile phone use for the learner driver and not allowing supervising drivers and passengers to use a speaker function on their mobile phone.

New South Wales

- Extending the learner period to 12 months;
- Requiring 120 hours of supervised practice; and
- Longer practical assessment drivers (Senserrick, 2007).

Changes are also planned for the other phases of the GDL systems. Further research that examines the impact of these changes will help identify if these countermeasures are effective in reducing the crash risk of novice drivers. This research should occur in a nationally coordinated manner that enables not only pre- and post-introduction comparisons but also comparisons between the different jurisdictions.

### **5.7.4 Research methodologies**

Although this research provides important insights into learner driver experiences, it is difficult to generalise this research across licensing systems due to their inherent differences. This research was conducted in two Australian jurisdictions, Queensland and New South Wales. Further research in other jurisdictions will help confirm what learner drivers experience and what affects these experiences.

This research was based on self-report data collected using telephone interviews. While this was useful in gaining an understanding of the factors that influence learner driver behaviour, additional research is needed to compare the self-report nature of the data collected in this study with data collected using alternative techniques. As an example, a study that uses crash data from the relevant road authorities will provide further information regarding the types of crashes that learners' experience. Alternatively, focus group research will enable the exploration of the factors that impact on their experiences such as accumulation of supervised experience or participation in formal driver education and training more thoroughly. Further research which uses alternative methods of

recording and measuring driving experience including diaries (Harrison, 2004) or electronic measurement will help to confirm some of the findings within this study, particularly those relating to the amount of practice undertaken.

## 5.8 Study strengths and limitations

The participation rates for this study, with 71.9 per cent of individuals approached agreeing and 79.4 per cent of those who agreed completing the study, were relatively high. Overall, of the 687 eligible individuals approached, 392 completed the study (57.1 per cent). This is a much higher participation rate than the other methods considered such as on-line administration which, depending on how the survey was administered, had participation rates varying between seven and 20 per cent (Ivers et al., 2003).

Another strength of the study was the use of theory to assist in explaining the behaviour of learner drivers. Much road safety research is applied and lacks a theoretical basis. The use of psychosocial theories such as Akers' Social Learning Theory and sensation seeking enables a more comprehensive and informed understanding of road user behaviour. Additionally, the piloting process for this study was useful in demonstrating the effectiveness of the method for data collection as well as the concepts being measured. This enabled confidence in the data collection processes. The collection of data across two different licensing jurisdictions enhanced the scope of the research.

Participants were only recruited from larger driver licensing centres in both Queensland and New South Wales. This was to ensure that there was a sufficient throughput of drivers to recruit enough participants for the study. When the smaller centres of Ballina and Lismore were used, it was difficult to recruit enough participants and the location had to be changed to the larger centre of Newcastle to ensure sufficient numbers. However, the use of these larger centres may have biased the results. There may be inherent differences in learners who obtain their licences in locations with smaller licensing centres. This may be reflected in the fact that there was a difference between the numbers agreeing to participate based on geographic location. This difference may also have been impacted on by the different recruiters. For logistical reasons, each recruiter only worked in one location making it difficult to disentangle the effects of location and recruiter. There was also a difference in the participants recruited by gender with females more likely to agree to participate. This may also impact on the study's results. As such, caution should be exercised when generalising the results to learner drivers as a whole in two states or elsewhere in Australia.

The self-report nature of the interview is another limitation. Participants may have difficulty remembering the details of their learner driver experiences such as the amount of driving that they undertook at night. However, self-report data relating to a number of behaviours, including drink driving and crashes, is considered to have an acceptable level of validity when it is collected anonymously and there are no consequences associated with providing responses (Zhao et al., 2006). This was the case with these interviews.

There were a limited number of responses to some questions which makes it difficult to gain an accurate picture of what is occurring in relation to these issues. As an example, very few participants (fortunately) had experienced a crash while driving on their learner licence which made it impossible to accurately describe these crashes and analyse the factors that led to crashes.

It is likely that some external events also affected the study. For instance, the responses to questions regarding practicing driving in the rain are likely to be skewed due to the limited amount of rain that fell in some geographic locations during this study.

## 5.9 Conclusions

This study examined learner driver experiences in two Australian states (Queensland and New South Wales) with the aim of developing a greater understanding of the factors that influence these experiences in order to develop more effective driver licensing systems. This research had both applied elements that examined experiences such as amount of supervised practice and the type of supervised practice as well as a theoretical element. The research used Akers' Social Learning theory and sensation seeking to help explain the behaviour of novice drivers.

The key findings of this research are:

- The average number of attempts that participants required to pass the learner theory test was 1.84 times ( $sd = 1.8$ ). The number of attempts, although not statistically significant, varied across the four regions with participants in metropolitan Queensland attempting the test 1.75 times ( $sd = 1.03$ ), regional Queensland 2.11 times ( $sd = .92$ ), metropolitan New South Wales 1.95 times ( $sd = 3.16$ ) and regional New South Wales 1.46 times ( $sd = .88$ ).
- Requiring participants to complete a set number of hours of supervised practice impacts on the amount of practice undertaken. It appears that once the target number of hours is reached by some learners, their supervised practice ceases.
- Mandating the number of hours required does not appear to influence learner driver perceptions regarding how difficult it is to obtain supervised practice.
- Overall parents (mothers and then fathers) provide the most lessons and practice opportunity for participants. Professional driving instructors also provide substantial amounts of supervision.
- Most learners believe that their parents are helpful and supportive when they are obtaining their driving licence. Parents in New South Wales assist their children in obtaining the mandated hours of practice.
- Participants in New South Wales, when compared with participants in Queensland, are more likely to practice their driving in an automatic vehicle and obtain an automatic provisional licence.
- Participants in New South Wales were more likely to display L plates and complete a log book recording the amount of supervised practice that they undertook. Over two thirds of Queensland participants (67.7 per cent) were unaware that a voluntary log book existed in Queensland.
- Learner drivers generally report complying with the road rules and indicated that they were likely to obey the road rules once they obtained their provisional licence. They are less likely to comply with recommended actions that are not mandatory such as reducing their driving at night.
- The participants from Queensland appeared less likely to structure their practice. However, almost half of the sample reported that they drove to and from activities that they would have attended anyway. They also drove their parents or their siblings and friends to and from activities, although they did this less frequently. Almost half of the sample made trips for the purpose of practising three to eight times a month. Nearly 40 per cent of the sample deliberately practised their driving at night. Age predicted the frequency with which learners drove to and from activities that they would have attended anyway as well as the frequency with which they deliberately practised their driving at night or with passengers. Whether the



participant was employed full time or part time also impacted on whether they drove to and from activities that they would have attended anyway. Participants were more likely to deliberately practise their driving on weekdays rather than weekends.

- Nearly 15 per cent of the sample reported that they drove unsupervised on the road while on their learner licence for an average of 37.8 minutes.
- Very few learners participated in formal driver education and training courses.
- The average number of attempts made to pass the practical driving test was 1.5 ( $sd = 0.8$ ). Gender was the only socio-demographic variable that predicted this, with females reporting that they required more attempts to pass the test than males.
- The application of Akers' Social Learning Theory and sensation seeking are useful in helping to explain the behaviour of learner drivers and their intentions regarding further driving on their provisional licence. Factors such as anticipated social rewards of their behaviour and sensation seeking appear to influence both their behaviour on their learner licence as well as their intended behaviour on their provisional licence.

This study has a number of implications for driver licensing policy particularly in the areas of mandating supervised practice, the use of log books and influencing perceptions of risk. Driving licensing authorities need to carefully consider if they should mandate that learners are required to complete a set number of hours of supervised driving and, if so, the number of hours. This is because, at least based on the 50 hours requirement in place in New South Wales, it appears to reduce the amount of practice that some learners obtain, although it does ensure that almost all learners obtain the minimum level. There may also be impacts on the minimum period of supervision required with the requirement for more hours requiring a longer minimum period of supervision.

The use of log books appears to help learners structure their practice. Therefore, there may be a benefit in requiring the completion of log books even if there is no required minimum number of hours of practice. The log book could also assist in communication between the different instructors of the learner driver. Given that this research demonstrated that two-thirds of learners were unaware that a log book existed (where it was voluntary) this log book would need to be compulsory.

The confidence of learner drivers increases from when they obtain their learner licence to when they obtain their provisional licence. Although this issue is more relevant for provisional drivers, policy makers need to ensure that they engage with learners and their parents to develop strategies that manage and capitalise on perceptions of risk.

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## APPENDIXES

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## APPENDIX A: QUALITATIVE PILOT RESULTS

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### *Sample*

Six people participated in the qualitative pilot. Two people who were approached declined to participate as they lacked the time. Of the six participants, four were female and two were male.

### *How long ago did you get your learner licence?*

The answers ranged from five years ( $N = 2$ ) to six months ago ( $N = 3$ ). The last person had obtained their learner licence three years ago.

### *How many times did you sit the learner's test altogether?*

Four people sat the learner's test twice. One person sat for it four times and the other person sat for it once.

### *How long ago did you actively start learning to drive on-the-road?*

The answers ranged from six months ago to two months ago.

### *How many hours of supervised practice did you do before passing the practical driving test?*

Three drivers had 12 hours of supervised practice. The others had 40 hours, 20 hours and 15 hours.

### *Was there more than one person who provided you with driving practice? Who were they?*

Participants were provided with driving practice by their driving instructor, parents and friends.

### *Who provided you with the most practice?*

For all participants, bar one, a professional driving instructor provided them with the most practice. The last participant was provided with the most practice by their mum.

*How difficult was it to find opportunities to practice? Why?*

Four of the participants indicated that it was not difficult at all. The other two indicated that there were difficulties regarding access to a supervisor, access to a vehicle and fitting practice in with other commitments.

*Have you ever done a driver education course? What type?*

No participants had completed a driver education course.

*What driving experience did you have prior to getting a learner licence?*

Two participants had experience driving on a farm while the others had no experience.

*How often did you display L plates while learning to drive?*

Participants displayed L plates at all times. One participant stated that they only commenced displaying the plates after it became compulsory.

*How often did you complete your logbook while learning to drive?*

No participants were aware that there was a logbook available.

*How often did you drive to and from activities that you would have done anyway while on your learner licence?*

Four participants indicated that they drove to and from activities that they would have done anyway. This ranged from three times a week to all the time.

*How often did you make special trips in the car for the purposes of practicing?*

Most of the participants made special trips in the car for the purposes of practicing. These ranged from once a fortnight ( $N = 1$ ), at least once a week ( $N = 3$ ) and three times a week ( $N = 1$ ). One person indicated that they did not make special trips for practice purposes.

*How often did you deliberately practice driving at night?*

The answers to this question ranged from never ( $N = 2$ ) to all the time ( $N = 1$ ).

*How likely is that you will limit your driving at night while on a provisional licence?*

The answers ranged from no restriction at all ( $N = 3$ ) to they will attempt to but tend to be out at night ( $N = 1$ ). The other participants indicated that they would try to limit this type of driving initially ( $N = 1$ ) and that it depended on the situation ( $N = 1$ ).

*How likely is that you will obey the speed limit while on a provisional licence?*

All participants indicated that it was likely that they would obey the speed limit while on a provisional licence.

*What do you think your chances are of getting caught by the Police for breaking the road rules while on your provisional licence?*

All participants indicated that the chances of them being caught breaking the road rules while on a provisional licence were slim.

*Have you been caught breaking the road rules while on your learner's licence?*

No participants had been caught breaking the road rules while on their learner's licence.

*Did you crash while on your learner's licence?*

Only one person had crashed while on their learner's licence. They got a flat tyre crashing into the gutter.

*Do you know of many people who break the road rules?*

Three people indicated that they knew people who break the road rules while the other three indicated that they did not.

The people who break the road rules were friends, brothers and a father. They tended to break the road rules a lot and had been caught performing this behaviour, generally by cameras. Some had also been caught by on-road enforcement. The road rule most commonly broken was speeding.

*Do your family or friends think there is anything wrong with breaking the road rules?*

All participants indicated that their family or friends think there is something wrong with the breaking the road rules.

*What good things can come from breaking the road rules?*

Most participants ( $N = 5$ ) stated that no good things can occur as a result of breaking the road rules. One person stated that speeding would ensure that you would get to places faster.

*What do your family think of you if you break the road rules?*

All participants indicated that their family would be disappointed if they broke the road rules.

*What do your friends think of you if you break the road rules?*

Five participants state that their friends would be unimpressed if they broke the road rules. One person stated that their friends would not care.

*What bad things can happen when you break the road rules?*

Participants listed consequences such as crashing, going to jail, being fined and losing their licence.

*Do you ever feel worried when you break the road rules?*

Only two participants answered this question. One indicated that they were nervous and panicky when they broke the road rules. The other stated that they did not break the road rules.

*Overall do you think more good things come from breaking the road rules than bad?*

All participants indicated that more bad things came from breaking the road rules than good things.

# APPENDIX B: INTERVIEW

## Interview

### NOVICE DRIVER SURVEY

<p><i>We'll begin the interview now. The first few questions are just about you. I won't be able to identify you from this information, but it will help me to see if I'm talking to a wide variety of people.</i></p>		
<p>1. Are you male or female?</p> <p>Male.....1</p> <p>Female.....2</p>		
<p>2. How old are you in years?</p> <p>_____</p>		6.1.1.1.1.1
<p>3. What about your marital status, are you:</p> <p>Single ..... 1</p> <p>Married ..... 2</p> <p>De facto/have a partner ..... 3</p> <p>Previously married (either divorced, widowed or separated)..... 4</p>		<b>Read categories</b>
<p>4. What is the highest level of education you have completed?</p> <p>Primary ..... 1</p> <p>Junior (Grade 10) ..... 2</p> <p>Senior (Grade 12)..... 3</p> <p>TAFE/Tech College/Apprenticeship ..... 4</p> <p>CAE/University ..... 5</p>		<b>Don't read categories</b>  <b>Code the highest level they've actually completed.</b>

<p>Other (<i>Please Specify</i> _____) ..... 6</p> <p>Are you still studying?</p> <p>Yes ..... 1</p> <p>No ..... 2</p>	
<p>5. What is the highest level of education your father has completed?</p> <p>Primary ..... 1</p> <p>Junior (Grade 10) ..... 2</p> <p>Senior (Grade 12) ..... 3</p> <p>TAFE/Tech College/Apprenticeship ..... 4</p> <p>CAE/University ..... 5</p> <p>Other (<i>Please Specify</i> _____) ..... 6</p>	<p><b><u>Don't</u> read categories</b></p> <p><b>Code the highest level they've actually completed.</b></p>
<p>6. What is the highest level of education your mother has completed?</p> <p>Primary ..... 1</p> <p>Junior (Grade 10) ..... 2</p> <p>Senior (Grade 12) ..... 3</p> <p>TAFE/Tech College/Apprenticeship ..... 4</p> <p>CAE/University ..... 5</p> <p>Other (<i>Please Specify</i> _____) ..... 6</p>	<p><b><u>Don't</u> read categories</b></p> <p><b>Code the highest level they've actually completed.</b></p>
<p>7. How many of your parents drive? _____</p>	
<p>8. Do you have a job at the moment?</p> <p>Yes ..... 1</p> <p>No ..... 2</p> <p>If yes, what do you do? _____</p>	<p><b>If more than one job - ask about the position in which they work the most hours.</b></p>



<p>Is your job full time or part time?</p> <p>Full time ..... 1</p> <p>Part time ..... 2</p>	
<p>9. Could you tell me how much you earn before tax in a year?</p> <p>Less than \$10,000 ..... 1</p> <p>\$11,000 – \$20,000..... 2</p> <p>\$21,000 – \$30,000..... 3</p> <p>\$31,000 – \$40,000..... 4</p> <p>\$41,000 – \$50,000..... 5</p> <p>\$51,000 – \$60,000..... 6</p> <p>More than \$60,000 ..... 7</p>	<p>6.1.1.1.1.1.</p>
<p>10. Could you tell me how much your parents combined earn before tax in a year?</p> <p>Less than \$10,000 ..... 1</p> <p>\$11,000 – \$30,000..... 2</p> <p>\$31,000 – \$50,000..... 3</p> <p>\$51,000 – \$70,000..... 4</p> <p>\$71,000 – \$90,000..... 5</p> <p>\$91,000 – \$110,000..... 6</p> <p>More than \$110,000 ..... 7</p> <p>I don't know ..... 8</p>	
<p>11. How many cars in your household was it possible for you to learn to drive in?</p> <p>_____</p> <p>How many cars were manual? _____</p> <p>How many were automatic? _____</p>	

<p>How many manual cars did you learn to drive in? _____</p> <p>How many automatic cars did you learn to drive in? _____</p>	
<p>12. How long ago did you <b>first</b> sit the test to obtain your learner's licence?</p> <p>Years _____ Months _____</p> <p>How long ago did you sit this test and <b>pass</b>?</p> <p>Years _____ Months _____</p> <p>How many times did you sit the learner's test altogether? _____</p> <p>Have you held your learner's licence continuously since then?    Yes            No</p> <p>How long ago did you actively start learning to drive on-the-road? By this I mean, when did you start learning to drive in order to obtain a provisional licence.</p> <p>Years _____ Months _____</p> <p>How long did you hold your learner's licence before you attempted your first practical test?</p> <p>Years _____ Months _____</p>	<p><b>Record months if less than 1 year</b></p>
<p>13. Did you complete 50 hours of supervised practice? (NSW only)</p> <p>Yes.....1</p>	

<p>No.....2</p>	
<p>14. How many hours of learning to drive and practising to drive would you have undertaken prior to obtaining your provisional licence?</p> <p>Less than 10 hours.....1</p> <p>10 to 25 hours..... 2</p> <p>26 to 50 hours..... 3</p> <p>51 hours to 75 hours ..... 4</p> <p>76 hours to 100 hours ..... 5</p> <p>Over 100 hours..... 6</p> <p>How many hours were with a professional instructor? _____</p> <p>How many hours were with your parents/friends? _____</p>	<p><b>Record number of hours</b></p>
<p>15. Have you ever done a driver education course?</p> <p>Yes ..... 1</p> <p>No..... 2</p> <p>If yes: Was this decision made privately by you or your parents, or did you do this through your school?</p> <p>Privately ..... 1</p> <p>School..... 2</p> <p>Other..... 3</p> <p>Which course did you do?</p> <p>_____</p>	

<p>Was the course classroom based or practically based?</p> <p>Classroom..... 1</p> <p>Practical..... 2</p>	
<p>16. Did you ever practice driving on-road without a supervisor while on a learner's licence?</p> <p>Yes. .... 1</p> <p>No..... 2</p> <p>If yes, how many hours? _____</p>	
<p>17. Did you obtain your provisional licence on your first attempt?</p> <p>Yes ..... 1</p> <p>No..... 2</p> <p>If no, how many attempts did you make? _____</p>	<p><b>Record answer</b></p>
<p>18. Who was the person who provided you with the most lessons and/or driving practice?</p> <p>Mother ..... 1</p> <p>Father..... 2</p> <p>Family friend..... 3</p> <p>Sibling ..... 4</p> <p>Professional driving instructor ..... 5</p> <p>Other..... 6</p> <p>If other: Who? _____</p>	<p><b>If more than one – ask who performed most of the duties</b></p>

<p>What kind of things did this person do to help you learn to drive? Some examples may include, providing driving lessons, giving you opportunities to practice.</p> <hr/>	
<p>19. Was there another person who made a significant contribution to you learning to drive?</p> <p>Yes.....1</p> <p>No.....2</p> <p>If Yes, Who? (Only one response)</p> <p>Mother ..... 1</p> <p>Father..... 2</p> <p>Family friend..... 3</p> <p>Sibling ..... 4</p> <p>Professional driving instructor ..... 5</p> <p>Other..... 6</p> <p>If other: Who? _____</p> <p>What kind of things did this person do to help you to learn to drive? Some examples may include, providing driving lessons, funding professional lessons, giving you opportunities to practice.</p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p><b>Go to Q20 if there is not a secondary tutor</b></p>
<p>20. How difficult was it to find opportunities to practice on your learner's licence?</p>	

<p>Very difficult                      Difficult                      Unsure                      Easy                      Very easy</p> <p>Why was this? Lack of access to a vehicle/supervisor/both?</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	
<p>21. Did you obtain a manual or an automatic licence?</p> <p>Manual..... 1</p> <p>Automatic..... 2</p> <p>Was the car you gained most of your pre-provisional experience in a:</p> <p>Manual..... 1</p> <p>Automatic..... 2</p>	<p><b>Record answers</b></p>
<p>22. Prior to obtaining your <b>learner</b> licence, what driving experience did you have?</p> <p>None..... 1</p> <p>Driving a car illegally on road .....2</p> <p>Driving a car legally offroad.....3</p> <p>Driving other vehicles such as trail bikes .....4</p> <p>Other (please specify _____) .....5</p>	<p><b>Read responses to participant</b></p> <p><b>May have more than one response</b></p>
<p>23. Did your private or professional driving tutor discuss any road safety issues such as drink driving or speeding with you prior to you obtaining your provisional licence?</p> <p>Yes.....1</p> <p>No.....2 (Go to Q24)</p> <p>If yes: What road safety issues did your private driving tutor discuss?</p>	<p><b>Record the road safety issues such as drink driving discussed</b></p>

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If yes: What road safety issues did your professional driving tutor discuss?

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24. The following statements are about your behaviour while you were learning to drive. Could you tell me how much you did or did not perform each of the following. Remember you can give an answer from '1' never to '7' always. There are no right or wrong answers.

	Never						Always
I displayed L plates .....	1	2	3	4	5	6	7
I did not drive more than 10km/hr over the speed limit in 60km/hr speed zones .....	1	2	3	4	5	6	7
I did not drive more than 10km/hr over the speed limit in 100km/hr speed zones .....	1	2	3	4	5	6	7
I wore my seat belt.....	1	2	3	4	5	6	7
I did not drive under the influence of illegal drugs like marihuana.....	1	2	3	4	5	6	7
I did not drive under the influence of legal drugs.....	1	2	3	4	5	6	7

<p>I allowed two seconds between my car and the car in front on highways ..... 1 2 3 4 5 6 7</p> <p>I did not drink any alcohol before driving ..... 1 2 3 4 5 6 7</p> <p>I completed my log book each time I went driving 1 2 3 4 5 6 7</p> <p>FOR QLD – Record if not aware of logbook Not aware</p>	
<p>25. The following statements are about how you gained experience while driving on your learner licence. You can answer from 1 ‘not at all’ to 7 ‘over 10 times a month’.</p> <p style="text-align: center;">Not at all 1-2 3-4 5-6 7-8 9-10 &gt;10</p> <p>I drove to and from activities that I would have attended anyway such as sports practice . 1 2 3 4 5 6 7</p> <p>I drove my parents to or from activities that they would have attended anyway such as shopping 1 2 3 4 5 6 7</p> <p>I drove my sisters, brothers and friends to and from activities that they would have attended anyway 1 2 3 4 5 6 7</p> <p>I made special trips in the car for the purposes of practicing with my professional driving instructor 1 2 3 4 5 6 7</p> <p>I made special trips in the car for the purposes of practicing with my parent or other private tutor 1 2 3 4 5 6 7</p>	



I deliberately practised driving in suburban areas	1	2	3	4	5	6	7	
I deliberately practised driving in the central business district of a major town or city .....	1	2	3	4	5	6	7	
I deliberately practised driving in rural areas...	1	2	3	4	5	6	7	
I deliberately practised driving in the rain .....	1	2	3	4	5	6	7	
I deliberately practised driving with passengers other than my supervisor in the car .....	1	2	3	4	5	6	7	
I deliberately practised driving at night .....	1	2	3	4	5	6	7	
I deliberately practised driving on the weekends	1	2	3	4	5	6	7	
I deliberately practised driving on weekdays...	1	2	3	4	5	6	7	
26. How risky do you think driving is now?								
Not very risky risky	Not risky	Unsure	Risky	Very				
How risky did you think driving was when you first started?								
Not very risky risky	Not risky	Unsure	Risky	Very				
27. Please answer the following based on your usual or typical feelings about driving. You can answer from 1 'not at all' to 10 'very much'.								

<p>I would like to risk my life as a racing driver .. 1 2 3 4 5 6 7 8 9 10</p> <p>I sometimes like to frighten myself a little while driving ..... 1 2 3 4 5 6 7 8 9 10</p> <p>I get a real thrill out of driving fast ..... 1 2 3 4 5 6 7 8 9 10</p> <p>I enjoy listening to loud exciting music while driving ..... 1 2 3 4 5 6 7 8 9 10</p> <p>I like to raise my adrenaline levels while driving 1 2 3 4 5 6 7 8 9 10</p> <p>I would enjoy driving a sports car on a road with no speed limit..... 1 2 3 4 5 6 7 8 9 10</p> <p>I enjoy the sensation of accelerating rapidly.... 1 2 3 4 5 6 7 8 9 10</p> <p>I enjoy cornering at high speed ..... 1 2 3 4 5 6 7 8 9 10</p> <p>In general I enjoy driving..... 1 2 3 4 5 6 7 8 9 10</p>	
<p>28. How skilful do you think you are compared to <u>all other</u> drivers? You can answer from 1 'well below average' to 5 'well above average.</p> <p style="text-align: center;">Well below average <span style="float: right;">Well above</span></p> <p>average</p> <p>Fluent driving (managing your car in traffic) .. 1 2 3 4 5</p>	

Perceiving hazards in traffic .....	1	2	3	4	5		
Conforming to traffic rules .....	1	2	3	4	5		
Driving fast if necessary .....	1	2	3	4	5		
Paying attention to other road users.....	1	2	3	4	5		
Driving in the dark.....	1	2	3	4	5		
Conforming to the speed limits.....	1	2	3	4	5		
29. Compared to the average driver of your age and gender, how would you rate the following? You can answer from well below average to well above average.							
		Well below average				Well above average	
Your chances of staying healthy during the next winter .....	1	2	3	4	5		
Your chances of being fined while driving.....	1	2	3	4	5		
Your chances of being injured in a road crash while driving within the next two years.....	1	2	3	4	5		
Your chances of developing cancer .....	1	2	3	4	5		
Your chances of being injured in a road crash while you are drink driving.....	1	2	3	4	5		



<p>You will display P plates even though they are not compulsory (QLD only)..... 1 2 3 4 5 6 7</p> <p>You will still tow vehicles, even though the law says you can't (NSW only) ..... 1 2 3 4 5 6 7</p> <p>You will not drive after a couple of drinks, even if you may be over the limit ..... 1 2 3 4 5 6 7</p> <p>You will not break the road rules even if you knew you wouldn't get caught..... 1 2 3 4 5 6 7</p> <p>You will obey the vehicle power restriction (NSW)..... 1 2 3 4 5 6 7</p> <p>If you lost your provisional licence for a serious offence you will not drive with a passenger (NSW)..... 1 2 3 4 5 6 7</p>	
<p>31. The next questions are about breaking the road rules. You can answer from strongly disagree to strongly agree. Breaking the road rules involves making a decision to not obey a traffic law or regulation designed to make the roads safer. This includes speeding and drink driving laws but not parking or transit lane regulations.</p> <p style="text-align: center;">Strongly disagree <span style="float: right;">Strongly agree</span></p> <p>Breaking the road rules gives you a thrill ..... 1 2 3 4 5 6 7</p> <p>Your <b>friends</b> don't care about you breaking the</p>	

road rules, providing you don't get caught.....	1	2	3	4	5	6	7
Your <b>family</b> don't care about you breaking the road rules, providing you don't get caught .....	1	2	3	4	5	6	7
Most of your <b>friends</b> would think it was cool for you to break the road rules.....	1	2	3	4	5	6	7
Most of your <b>family</b> would think it was cool for you to break the road rules.....	1	2	3	4	5	6	7
Breaking the road rules makes you feel good .	1	2	3	4	5	6	7
Breaking the road rules makes you feel bad ...	1	2	3	4	5	6	7
Your <b>friends</b> would think you were really stupid if you broke the road rules .....	1	2	3	4	5	6	7
Your <b>family</b> would think you were really stupid if you broke the road rules .....	1	2	3	4	5	6	7
The penalties for breaking the road rules are very harsh.....	1	2	3	4	5	6	7
You are likely to be punished if you get caught breaking the road rules .....	1	2	3	4	5	6	7

<p>You are likely to be punished quickly if you get caught breaking the road rules ..... 1 2 3 4 5 6 7</p> <p>Breaking the road rules is generally worth the risks involved ..... 1 2 3 4 5 6 7</p> <p>Overall more good things are likely to come from breaking the road rules than bad ..... 1 2 3 4 5 6 7</p> <p>Your <b>family</b> would be concerned if you broke the road rules..... 1 2 3 4 5 6 7</p> <p>Your <b>friends</b> would be concerned if you broke the road rules..... 1 2 3 4 5 6 7</p>	
<p>32. If you were to break the road rules, how likely do you think it is that you will get caught breaking the road rules while on your provisional licence?</p> <p>Very unlikely                  Unlikely                  Unsure                  Likely                  Very likely</p> <p>How likely do you think it is that you will break the road rules while on your provisional licence?</p> <p>Very unlikely                  Unlikely                  Unsure                  Likely                  Very likely</p>	
<p>33. The following statements are about what your friends do while driving. You can answer these from none of your friends - 1 - to all of your friends -5. There are no right or wrong answers.</p>	

	None	Few	Some	Many	All
Do your friends obey the road rules? .....	1	2	3	4	5
Do your friends stick to the speed limit in a 60km/hr zone (drive under 70km/hr)? .....	1	2	3	4	5
Do your friends stick to the speed limit in a 100km/hr zone (drive under 110km/hr)? .....	1	2	3	4	5
Do your friends wear seatbelts? .....	1	2	3	4	5
Do your friends drive under the influence of illegal drugs like marihuana? .....	1	2	3	4	5
Do your friends drive under the influence of legal drugs? .....	1	2	3	4	5
Do your friends allow two seconds between their car and the car in front on highways? .....	1	2	3	4	5
Do your friends display P plates? .....	1	2	3	4	5
Do your friends get caught drink driving? .....	1	2	3	4	5
Do your friends get caught speeding in a 60km/hr zone (drive under 70km/hr)? .....	1	2	3	4	5



<p>Do your friends get caught speeding in a 100km/hr zone (drive under 110km/hr)? ..... 1      2      3      4      5</p> <p>Did your friends get 50 hours of supervised practice (NSW only)? ..... 1      2      3      4      5</p> <p>Do your friends drive after a couple of drinks, even if they may be over the limit ..... 1      2      3      4      5</p> <p>Did your friends display L plates while learning? 1      2      3      4      5</p>	
<p>34. The following statements are about what your parents do while driving. There are no right or wrong answers.</p> <p>How many of your parents obey the road rules? _____</p> <p>How many of your parents stick to the speed limit in a 60km/hr zone (drive under 70km/hr)? _____</p> <p>How many of your parents stick to the speed limit in a 100km/hr zone (driver under 110km/hr)? _____</p> <p>How many of your parents wear seatbelts? _____</p> <p>How many of your parents drive under the influence of illegal drugs like marihuana? _____</p> <p>How many of your parents drive under the influence of legal drugs? _____</p> <p>How many of your parents allow two seconds between their car and the car in front on</p>	

<p>highways? _____</p> <p>How many of your parents get caught drink driving? _____</p> <p>How many of your parents get caught speeding in a 60km/hr zone (drive under 70km/hr)? _____</p> <p>How many of your parents get caught speeding in a 100km/hr zone (drive under 110km/hr)? _____</p> <p>How many of your parents drive after a couple of drinks, even if they may be over the limit _____</p> <p>How many of your parents make it difficult for you to get 50 hours of supervised practice (NSW only)? _____</p>																															
<p>35. The following statements are about what other drivers generally do while driving on the road. You can answer these from none to all. There are no right or wrong answers.</p> <table style="width: 100%; border-collapse: collapse; margin-top: 20px;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 10%; text-align: center;">None</th> <th style="width: 10%; text-align: center;">Few</th> <th style="width: 10%; text-align: center;">Some</th> <th style="width: 10%; text-align: center;">Many</th> <th style="width: 10%; text-align: center;">All</th> </tr> </thead> <tbody> <tr> <td>Do other drivers obey the road rules? .....</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Do other drivers stick to the speed limit in a 60km/hr zone (drive under 70km/hr)? .....</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Do other drivers to the speed limit in a 100km/hr zone (driver under 110km/hr)? .....</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Do other drivers wear seatbelts? .....</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> </tr> </tbody> </table>		None	Few	Some	Many	All	Do other drivers obey the road rules? .....	1	2	3	4	5	Do other drivers stick to the speed limit in a 60km/hr zone (drive under 70km/hr)? .....	1	2	3	4	5	Do other drivers to the speed limit in a 100km/hr zone (driver under 110km/hr)? .....	1	2	3	4	5	Do other drivers wear seatbelts? .....	1	2	3	4	5	
	None	Few	Some	Many	All																										
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<p>Do other drivers drive under the influence of illegal drugs like marihuana? ..... 1      2      3      4      5</p> <p>Do other drivers drive under the influence of legal drugs? ..... 1      2      3      4      5</p> <p>Do other drivers allow two seconds between their car and the car in front on highways?      1      2      3      4      5</p> <p>Do other drivers get caught drink driving? ..... 1      2      3      4      5</p> <p>Do other drivers get caught speeding in a 60km/hr zone (drive under 70km/hr)? ..... 1      2      3      4      5</p> <p>Do other drivers get caught speeding in a 100km/hr zone (drive under 110km/hr)? ..... 1      2      3      4      5</p> <p>Do other drivers drive after a couple of drinks, even if they may be over the limit ..... 1      2      3      4      5</p>	
<p>36. Have you ever been caught for committing any driving offences? A driving offence is being caught for not obeying a traffic law or regulation designed to make the roads safer. This includes speeding and drink driving laws but not parking or transit lane regulations.</p> <p>Yes            1            No    2</p> <p>If yes: Did you get a ticket in the mail?</p> <p>Yes            1            No    2</p>	



<p>If yes: How many times? _____</p> <p>For each actual crash:</p> <p>Was another vehicle, pedestrian or cyclist involved?      Yes      1              No      2</p> <p>Did anyone receive a minor injury?                              Yes      1              No      2</p> <p>Did anyone receive an injury that required them to go to hospital?    Yes                              1              No 2</p> <p>Was anyone killed?    Yes                              1              No 2</p>		
<p>We would like to be able to match this first questionnaire with a second one we will be giving out after you've had some further experience driving your car. However, we do not want to be able to identify you.</p> <p>One way around this is to label both questionnaires with information that won't mean anything to us, but which will allow us to match the 2 questionnaires so that the information stays together.</p> <p>If you are happy to do so, could you please tell us your mother's initials, and the day and month of her birth. (If you are not happy to do this, please don't)</p> <p><b>Mother's initials</b> _____      <b>Day and month</b> of her birth _____</p>		

Record the date of interview: \_\_\_\_\_

Record the time of interview: \_\_\_\_\_

Were they with a driving school or parent? \_\_\_\_\_

Participant No on recruitment sheet: \_\_\_\_\_

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## APPENDIX C: INFORMATION AND CONSENT FORM

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### Information Sheet

#### Graduated Driver Licensing in Australia: How effective are its components and who complies?

You are invited to take part in a survey about how people learn to drive and the various factors that affect this process. If you agree to take part, you will be asked a range of questions about your driving and other aspects of your life. The information you will provide will assist in the design of more effective driver licensing systems.

The information you provide will be kept completely confidential. Your answers will not voluntarily be passed onto the Police.

We will ask you for contact details today so we can ring you to conduct the survey in the next 4 weeks. We will also ring you in twelve months time so we can follow you up. After this follow up survey, we will destroy these details.

The survey is voluntary and you are able to stop at any time if you feel uncomfortable.

The survey should take about 20 minutes to complete. We will provide you with a free movie ticket afterwards to thank you for your help.

If you would like to help us, please sign the consent form that is attached to this page.

This study is being completed as part of a PhD thesis. You can contact Lyndel Bates via email ([lj.bates@student.qut.edu.au](mailto:lj.bates@student.qut.edu.au)) or by telephone (3864 4955) if you have any questions about this research.

If you have any concerns about the ethical conduct of this research, please contact the University Research Ethics Officer via email ([ethicscontact@qut.edu.au](mailto:ethicscontact@qut.edu.au)) or by telephone (3864 2340).

Thank you. Please keep this page for your future reference.



### Statement of Consent

By signing below, you are indicating that you :

- have read and understood the information sheet about this project;
- have had any questions answered to your satisfaction;
- understand that if you have any other questions you can contact the research team;
- understand that you are free to withdraw from participating at any time, without comment or penalty;
- understand that you can refuse to discuss any issue, at any time, without comment or penalty;
- understand that you can contact the research team if you have any questions about the project, or the University Research Ethics Officer if you have concerns about the ethical conduct of the project;
- agree to participate in the project;
- consent to being contacted within the next four weeks by telephone for the first survey; and
- consent to being contacted in twelve months by telephone for a follow-up survey.

NAME (please print) \_\_\_\_\_

TELEPHONE NUMBER ( ) \_\_\_\_\_

Alternative Telephone number ( ) \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE / /

PLEASE DO NOT RING ME AT THESE TIMES:

Day/s \_\_\_\_\_ Time/s \_\_\_\_\_

Day/s \_\_\_\_\_ Time/s \_\_\_\_\_

Day/s \_\_\_\_\_ Time/s \_\_\_\_\_



Day/s \_\_\_\_\_ Time/s \_\_\_\_\_

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*Thank you for helping us with this project.*

## APPENDIX D: SELF-REPORTED EXPERIENCES WHILE DRIVING ON A LEARNER'S LICENCE

Experience	QLD metro	QLD regional	NSW metro	NSW regional	Total	Significance
<i>Drove to and from activities that I would have attended anyway</i>	<i>n</i> = 111	<i>n</i> = 108	<i>n</i> = 98	<i>n</i> = 75	<i>N</i> = 392 (100%)	$X^2(6) = 28.40$ , $p < .001$
1-2 or less times per month	<i>n</i> = 34 (30.6%)	<i>n</i> = 15 (13.9%)	<i>n</i> = 11 (11.2%)	<i>n</i> = 5 (6.6%)	<i>n</i> = 65 (16.6%)	$\phi_c = .190$
3-8 times per month	<i>n</i> = 30 (27%)	<i>n</i> = 32 (29.6%)	<i>n</i> = 43 (43.9%)	<i>n</i> = 30 (40%)	<i>n</i> = 135 (34.4%)	
9 or more times per month	<i>n</i> = 47 (42.3%)	<i>n</i> = 61 (56.5%)	<i>n</i> = 44 (44.9%)	<i>n</i> = 40 (53.3%)	<i>n</i> = 192 (49%)	
<i>Drove my parents to and from activities that they would have attended anyway</i>	<i>n</i> = 108	<i>n</i> = 105	<i>n</i> = 92	<i>n</i> = 75	<i>N</i> = 380 (100%)	$X^2(6) = 40.85$ , $p < .001$
1-2 or less times per month	<i>n</i> = 50 (46.3%)	<i>n</i> = 62 (59%)	<i>n</i> = 28 (30.4%)	<i>n</i> = 16 (21.3%)	<i>n</i> = 156 (41.1%)	$\phi_c = .232$
3-8 times per month	<i>n</i> = 39 (36%)	<i>n</i> = 15 (14.3%)	<i>n</i> = 40 (43.5%)	<i>n</i> = 33 (44%)	<i>n</i> = 127 (33.4%)	
9 or more times per month	<i>n</i> = 19 (17.6%)	<i>n</i> = 28 (26.7%)	<i>n</i> = 24 (26.1%)	<i>n</i> = 26 (34.7%)	<i>n</i> = 97 (25.5%)	
<i>Drove my siblings and/or friends to and from activities that they would</i>	<i>n</i> = 111	<i>n</i> = 108	<i>n</i> = 98	<i>n</i> = 75	<i>N</i> = 392 (100%)	$X^2(6) = 10.70$ , $p = .095$

<i>have attended anyway</i>						
1-2 or less times per month	$n = 72$ (64.9%)	$n = 63$ (58.3%)	$n = 54$ (55.1%)	$n = 32$ (42.7%)	$n = 221$ (56.4%)	$\phi_c = .095$
3-8 times per month	$n = 24$ (21.6%)	$n = 24$ (22.2%)	$n = 29$ (29.6%)	$n = 26$ (34.7%)	$n = 103$ (26.3%)	
9 or more times per month	$n = 15$ (13.5%)	$n = 21$ (19.4%)	$n = 15$ (15.3%)	$n = 17$ (22.7%)	$n = 68$ (17.3%)	
<i>Made special trips with a professional instructor for the purposes of practising</i>	$n = 110$	$n = 106$	$n = 93$	$n = 72$	$N = 381$ (100%)	$X^2(6) = 25.35, p < .001$
1-2 or less times per month	$n = 30$ (27.3%)	$n = 32$ (30.2%)	$n = 43$ (46.2%)	$n = 34$ (47.2%)	$n = 139$ (36.5%)	$\phi_c = .182$
3-8 times per month	$n = 60$ (54.5%)	$n = 65$ (61.3%)	$n = 39$ (41.9%)	$n = 22$ (30.6%)	$n = 186$ (48.8%)	
9 or more times per month	$n = 20$ (18.2%)	$n = 9$ (8.5%)	$n = 11$ (11.8%)	$n = 16$ (22.2%)	$n = 56$ (14.7%)	
<i>Made special trips with a private instructor for the purposes of practising</i>	$n = 109$	$n = 106$	$n = 98$	$n = 75$	$N = 388$ (100%)	$X^2(6) = 28.77, p < .001$
1-2 or less times per month	$n = 30$ (27.5%)	$n = 20$ (18.9%)	$n = 12$ (12.2%)	$n = 8$ (10.7%)	$n = 70$ (18%)	$\phi_c = .193$
3-8 times per month	$n = 39$ (35.8%)	$n = 28$ (26.4%)	$n = 35$ (35.7%)	$n = 12$ (16%)	$n = 114$ (29.4%)	
9 or more times per month	$n = 40$ (36.7%)	$n = 58$ (54.7%)	$n = 51$ (52%)	$n = 55$ (73.3%)	$n = 204$ (52.6%)	
<i>Deliberately practised driving in a central business district</i>	$n = 111$	$n = 108$	$n = 98$	$n = 75$	$N = 392$ (100%)	$X^2(6) = 26.59, p < .001$

1-2 or less times per month	$n = 53$ (47.7%)	$n = 31$ (28.7%)	$n = 23$ (23.5%)	$n = 14$ (18.7%)	$n = 121$ (30.9%)	$\phi_c = .184$
3-8 times per month	$n = 31$ (27.9%)	$n = 43$ (39.8%)	$n = 46$ (46.9%)	$n = 28$ (37.3%)	$n = 148$ (37.8%)	
9 or more times per month	$n = 27$ (24.3%)	$n = 34$ (31.5%)	$n = 29$ (29.6%)	$n = 33$ (44%)	$n = 123$ (31.4%)	
<i>Deliberately practised driving in rural areas</i>	$n = 111$	$n = 108$	$n = 98$	$n = 73$	$N = 390$ (100%)	$X^2(6) = 79.51, p < .001$
1-2 or less times per month	$n = 85$ (76.6%)	$n = 59$ (54.6%)	$n = 72$ (73.5%)	$n = 16$ (21.9%)	$n = 232$ (59.5%)	$\phi_c = .319$
3-8 times per month	$n = 17$ (15.3%)	$n = 24$ (22.2%)	$n = 21$ (21.4%)	$n = 23$ (31.5%)	$n = 85$ (21.8%)	
9 or more times per month	$n = 9$ (8.1%)	$n = 25$ (23.1%)	$n = 5$ (5.1%)	$n = 34$ (46.6%)	$n = 73$ (18.7%)	
<i>Deliberately practised driving in the rain</i>	$n = 111$	$n = 108$	$n = 97$	$n = 75$	$N = 391$ (100%)	$X^2(6) = 49.38, p < .001$
1-2 or less times per month	$n = 72$ (64.9%)	$n = 54$ (50%)	$n = 37$ (38.1%)	$n = 16$ (21.3%)	$n = 179$ (45.8%)	$\phi_c = .251$
3-8 times per month	$n = 35$ (31.5%)	$n = 39$ (36.1%)	$n = 43$ (44.3%)	$n = 34$ (45.3%)	$n = 151$ (38.6%)	
9 or more times per month	$n = 4$ (3.6%)	$n = 15$ (13.8%)	$n = 17$ (17.5%)	$n = 25$ (33.3%)	$n = 61$ (15.6%)	
<i>Deliberately practised driving with passengers</i>	$n = 111$	$n = 108$	$n = 98$	$n = 74$	$N = 391$ (100%)	$X^2(6) = 27.42, p < .001$
1-2 or less times per month	$n = 62$ (55.9%)	$n = 50$ (46.3%)	$n = 43$ (43.9%)	$n = 20$ (27%)	$n = 175$ (44.8%)	$\phi_c = .187$
3-8 times per month	$n = 34$ (30.6%)	$n = 26$ (24.1%)	$n = 40$ (40.8%)	$n = 28$ (37.8%)	$n = 128$ (32.7%)	
9 or more times per month	$n = 15$ (13.5%)	$n = 32$ (29.6%)	$n = 15$ (15.3%)	$n = 26$ (35.1%)	$n = 88$ (22.5%)	
<i>Deliberately practised</i>	$n = 111$	$n = 108$	$n = 98$	$n = 74$ (18.9%)	$N = 391$	$X^2(6) =$

<i>driving at night</i>					(100%)	25.23, $p < .001$
1-2 or less times per month	$n = 41$ (36.9%)	$n = 34$ (31.5%)	$n = 17$ (17.3%)	$n = 8$ (10.8%)	$n = 100$ (25.6%)	$\phi_c = .180$
3-8 times per month	$n = 42$ (37.8%)	$n = 37$ (34.3%)	$n = 46$ (46.9%)	$n = 30$ (40.5%)	$n = 155$ (46.2%)	
9 or more times per month	$n = 28$ (25.2%)	$n = 37$ (34.3%)	$n = 35$ (35.7%)	$n = 36$ (48.6%)	$n = 136$ (34.8%)	
<i>Deliberately practised driving on weekends</i>	$n = 111$	$n = 108$	$n = 98$	$n = 74$	$N = 391$ (100%)	$X^2(6) = 34.51,$ $p < .001$
1-2 or less times per month	$n = 34$ (30.6%)	$n = 15$ (13.9%)	$n = 8$ (8.2%)	$n = 5$ (6.8%)	$n = 62$ (15.9%)	$\phi_c = .210$
3-8 times per month	$n = 44$ (39.6%)	$n = 47$ (43.5%)	$n = 52$ (53.1%)	$n = 27$ (36.5%)	$n = 170$ (43.5%)	
9 or more times per month	$n = 33$ (29.7%)	$n = 46$ (42.6%)	$n = 38$ (38.8%)	$n = 42$ (56.8%)	$n = 159$ (40.7%)	
<i>Deliberately practised driving on weekdays</i>	$n = 111$	$n = 108$	$n = 98$	$n = 74$	$N = 391$ (100%)	$X^2(6) = 16.17,$ $p = .013$
1-2 or less times per month	$n = 16$ (14.4%)	$n = 8$ (17.4%)	$n = 17$ (17.3%)	$n = 9$ (12.2%)	$n = 50$ (12.8%)	$\phi_c = .144$
3-8 times per month	$n = 46$ (41.4%)	$n = 39$ (36.1%)	$n = 43$ (43.9%)	$n = 18$ (24.3%)	$n = 146$ (37.3%)	
9 or more times per month	$n = 49$ (44.1%)	$n = 61$ (56.5%)	$n = 38$ (38.8%)	$n = 47$ (63.5%)	$n = 195$ (49.9%)	

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## APPENDIX B: SUMMARY OF SCALES

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### Akers' Social Learning Theory Scales

#### Items used to measure the behavioural dimension of differential association for friends

Participants could respond to the following questions using 1 'none of your friends' to 5 'all of your friends'.

- Do your friends obey the road rules?
- Do your friends stick to the speed limit in a 60km/hr zone (drive under 70km/hr)?
- Do your friends stick to the speed limit in a 100km/hr zone (drive under 110km/hr)?
- Do your friends wear seatbelts?
- Do your friends drive under the influence of illegal drugs like marihuana? (reverse scored)
- Do your friends drive under the influence of legal drugs? (reverse scored)
- Do your friends allow two seconds between their car and the car in front on highways?
- Do your friends display P plates?
- Do your friends get caught drink driving? (reverse scored)
- Do your friends get caught speeding in a 60km/hr speed zone (drive under 70km/hr)? (reverse scored)
- Do your friends get caught speeding in a 100km/hr speed zone (drive under 110 km/hr)? (reverse scored)
- Did your friends get 50 hours of supervised practice (NSW only)?
- Do your friends drive after a couple of drinks, even if they may be over the limit? (reverse scored)
- Did your friends display L plates while learning?

Cronbach's alpha: .825

#### Items used to measure the behavioural dimension of differential association for parents

Participants could respond to the following questions by stating the number of their parents that engage in the following behaviours.

- How many of your parents obey the road rules?
- How many of your parents stick to the speed limit in a 60km/hr zone (drive under 70km/hr)?
- How many of your parents stick to the speed limit in a 100km/hr zone (driver under 100km/hr)?
- How many of your parents wear seatbelts?
- How many of your parents drive under the influence of illegal drugs like marihuana? (reverse scored)
- How many of your parents drive under the influence of legal drugs? (reverse scored)

- How many of your parents allow two seconds between their car and the car in front on highways?
- How many of your parents get caught drink driving? (reverse scored)
- How many of your parents get caught speeding in a 60km/hr zone (drive under 70km/hr)? (reverse scored)
- How many of your parents get caught speeding in a 100km/hr zone (drive under 110km/hr)? (reverse scored)
- How many of your parents drive after a couple of drinks, even if they may be over the limit? (reverse scored)

Cronbach's alpha: .693

Items used to measure the behavioural dimension of differential association for other drivers

Participants could respond to the following questions using 1 'none' to 5 'all'.

- Do other drivers obey the road rules?
- Do other drivers tick to the speed limit in a 60km/hr zone (drive under 70km/hr)?
- Do other drivers stick to the speed limit in a 100km/hr zone (drive under 110km/hr)?
- Do other drivers wear seatbelts?
- Do other drivers drive under the influence of illegal drugs like marihuana? (reverse scored)
- Do other drivers drive under the influence of legal drugs? (reverse scored)
- Do other drivers allow two seconds between their car and the car in front on highways?
- Do other drivers get caught drink driving? (reverse scored)
- Do other drivers get caught speeding in a 60km/hr zone (drive under 70km/hr)? (reverse scored)
- Do other drivers get caught speeding in a 100km/hr zone (drive under 110km/hr)? (reverse scored)
- Do other drivers drive after a couple of drinks, even if they may be over the limit? (reverse scored)

Cronbach's alpha: .761

Items used to measure the normative dimension of differential association

Participants could respond to the following statements using 1 ‘strongly disagree’ to 7 ‘strongly agree’.

- Your friends don’t care about breaking the road rules, providing you don’t get caught (reverse scored)
- Your family don’t care about breaking the road rules, providing you don’t get caught (reverse scored)
- Most of your family think it is cool to break the road rules (reverse scored)
- Most of your friends think it is cool to break the road rules (reverse scored)

Cronbach’s alpha: .608

Items used to measure personal attitudes

Participants could respond to the following statements using 1 ‘strongly disagree’ to 7 ‘strongly agree’.

- Breaking the road rules gives you a thrill (reverse scored)
- Breaking the road rules makes you feel good (reverse scored)
- Breaking the road rules makes you feel bad

Cronbach’s alpha: .589

Items used to measure the negative reinforcement dimension (anticipated punishments) of differential reinforcement

Participants could respond to the following statements using 1 ‘strongly disagree’ to 7 ‘strongly agree’.

- Your friends would think you were really stupid if you broke the road rules (reverse scored)
- Your family would think you were really stupid if you broke the road rules (reverse scored)
- You are likely to be punished if you get caught breaking the road rules (reverse scored)
- You are likely to be punished quickly if you get caught breaking the road rules (reverse scored)
- Breaking the road rules makes you feel bad
- Your family would be concerned if you broke the road rules (reverse scored)
- Your friends would be concerned if you broke the road rules (reverse scored)

Cronbach’s alpha: .737

Items used to measure the positive reinforcement dimension (anticipated rewards) of differential reinforcement



Participants could respond to the following statements using 1 'strongly disagree' to 7 'strongly agree'.

- Breaking the road rules gives you a thrill (reverse scored)
- Breaking the road rules makes you feel good (reverse scored)
- Breaking the road rules is generally worth the risks involved (reverse scored)
- Overall more good things are likely to come from breaking the road rules than bad (reverse scored)

Cronbach's alpha: .730

### **Sensation seeking scale**

Items: Please answer the following based on your usual or typical feelings about driving. Participants could answer from 1 'not at all' to 10 'very much'.

- I would like to risk my life as a racing driver
- I sometimes like to frighten myself a little while driving
- I get a real thrill out of driving fast
- I enjoy listening to loud exciting music while driving
- I like to raise my adrenaline levels while driving
- I would enjoy driving a sports car on a road with no speed limit
- I enjoy the sensation of accelerating rapidly
- I enjoy cornering at high speed
- In general, I enjoy driving

Cronbach's alpha: .86

### **Learner driver behaviour scale**

The following items were part of the scale developed to measure learner driver behaviour. Participants could response to the following statements from 1 'never' to 7 'always'.

- I displayed L plates
- I did not drive more than 10km/hr over the speed limit in 60km/hr speed zones
- I did not drive more than 10km/hr over the speed limit in 100km/hr speed zones
- I wore my seat belt
- I did not drive under the influence of illegal drugs like marihuana
- I did not drive under the influence of legal drugs
- I allowed two seconds between my car and the car in front on highways
- I did not drink any alcohol before driving

Cronbach's alpha: .692

### **Learner intentions regarding provisional driving**

The following items were part of the scale developed to measure how learners intended to drive on their provisional licence. Participants could response to the following statements from 1 'never' to 7 'always'.

- You will drive with passengers of your age during the day (reverse scored)
- You will drive passengers of your age at night (reverse scored)
- You will not drive after a couple of drinks, even if you may be over the limit
- You will not break the road rules even if you knew you wouldn't get caught

Cronbach's alpha: .540