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EXAMINATION OF DIFFERENT PREDICTORS OF DIFFERENT RISKY DRIVING BEHAVIOURS IN YOUNG NSW DRIVERS

FINAL REPORT

for the Motor Accidents Authority of NSW

July, 2006

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EXECUTIVE SUMMARY

BACKGROUND

Road trauma is recognized as a serious problem both in Australia and internationally. Young drivers are over-represented in crashes among all classes of road user.

A range of factors may potentially contribute to road crashes. Risky driving has been identified as an important contributor to road crashes, although its role is not comprehensively understood. The focus of the present research will be on four risky driving-related behaviours: speeding, drink-driving, driving while fatigued, and not wearing seat belts. The successful manipulation of risky driving requires a good understanding of contributing factors. However, until recently no research has directly examined the differences between risky driving behaviours, in terms of precipitating factors. Our preliminary research (Fernandes & Job, 2003; Fernandes, Job & Hatfield, 2004) indicated that *different* factors predict *different* risky driving behaviours. For example, speeding was predicted by the authority rebellion scale, while drink driving was predicted by sensation seeking and illusory invulnerability.

The Health Belief Model (HBM; Janz & Becker, 1984) is used an initial framework, and additional factors that appear to be important are also considered. The HBM proposes that a person's decision whether or not to follow a health-related behaviour is determined by four dimensions: the *perceived susceptibility* to, and *perceived severity* of, the consequences of a risky behaviour, as well as the *perceived benefits*, and *perceived costs*, of the alternative safety behaviour (Becker, 1974).

The dependence on self-report measures to provide information about attitudes is a limitation of current research in this area. The present research will attempt to redress this issue, through the use of the Implicit Association Test (IAT; Greenwald, McGhee, and Schwartz, 1998). The IAT represents a hidden measure of attitudes. It measures differential associations of two target concepts with evaluations. It provides a measure of performance difference (response time) that

indicates whether an individual's attitude to a particular risky driving behaviour (e.g. speeding) is positive or negative.

This study examined a range of demographic factors, personality factors, attitudes and beliefs in the prediction of speeding, drink-driving, not wearing seat belts, and driving while fatigued, for young drivers aged 16-25 years, by the use of a Risky Driving Questionnaire.

Study 1 examined whether different beliefs and attitudes predict different risky driving behaviours among students.

Study 2 examined whether the results from the Study 1 student population sample generalize to a general population sample, and compared findings from the metropolitan Sydney sample with findings from a rural NSW sample.

Study 3 introduced four risky driving-related versions of the IAT versions to the field of road safety, and aimed to validate the attitudinal scales within the Risky Driving Questionnaire with the use of the IAT. Study 3 examined the relationship between the IAT and behavioural intentions, for each of the four risky driving behaviours. Additionally, Study 3 examined the test-retest reliability of the Risky Driving Questionnaire.

METHOD

For each of the four risky driving behaviours examined, the Risky Driving Questionnaire assessed demographic variables (such as age and gender), road-unrelated illusory invulnerability, road-related general illusory invulnerability, road-related specific illusory invulnerability, general and specific perceived susceptibility, general and specific perceived severity, perceived costs, perceived benefits, peer influence, behavioural intentions, authority-rebellion, time urgency, sensation seeking, driver anger, socially desirable responding, and road crash and infringement history.

In Study 1, 215 first-year School of Psychology students from the University of NSW (who were required to be 25 years of age or less, and to hold a current NSW drivers license) completed the Risky Driving Questionnaire individually.

In Study 2, participants were 587 drivers from metropolitan Sydney and 422 drivers from rural NSW who were required to hold a current NSW drivers license. Participants (age range of 16-25 years) were recruited outside RTA Motor Registries.

In Study 3, participants were 135 drivers from metropolitan Sydney who were required to hold a current NSW drivers license. All participants had previously participated in Study 2 and had given consent to be contacted via telephone regarding participation in a follow-up study. A meeting place and time was arranged with each participant. Participants completed the same Risky Driving Questionnaire version that they had completed in Study 2, as well as the risky driving-related IAT version relating to the same risky driving behaviour.

RESULTS AND DISCUSSION

For Study 1 and Study 2, hierarchical regression models for each of the four driving behaviours were compared. A gradation of factors was proposed, arranged in order of *how stable each set of factors were as an intrinsic characteristic of the person*. Accordingly, three regression models were considered for each behaviour: the 'Demographics only' model, followed by the 'Demographics plus personality factors' model, and finally the 'Demographics plus personality factors plus beliefs' model.

Study 3 assessed test-retest reliability of the Risky Driving Questionnaire, and the relationship between implicit attitudes and Risky Driving Questionnaire measures employing Pearson's correlation coefficients, for each of the four risky driving behaviours.

The possibility of different factors predicting different risky driving behaviours

Results indicated that different factors predict different risky driving behaviours, supporting our preliminary research in this field (Fernandes & Job, 2003; Fernandes et al., 2004). These results indicate the importance of considering separate underlying mechanisms for individual risky driving behaviour. As such, each behaviour should be investigated individually in search of different causal factors. In addition, practical attempts to curb one particular behaviour cannot be assumed from the apparent success of another.

For all three samples (student population, metropolitan Sydney population, and rural NSW population) those factors specific to a particular risky driving significantly predicted that behaviour, for each of the three samples. It appears that, for these behaviours, the more approving attitudes people hold (specific to each risky driving behaviour), the more they will engage in that particular behaviour. This finding suggests that specific attitudes are consistent and robust predictors of risky driving, and supports recent research illustrating the importance of investigating those attitudes and beliefs specific to individual risky driving behaviours, rather than *general* road safety attitudes and beliefs (Fernandes & Job, 2003; Fernandes et al., 2004; Iversen, 2004).

Speeding

For all three samples examined in the present study, speeding was significantly predicted by: gender, driver anger, sensation seeking, authority rebellion, time urgency, road-unrelated illusory invulnerability, road-related general illusory invulnerability, road-related specific illusory invulnerability, general perceived susceptibility, specific perceived susceptibility, perceived costs of not speeding, and peer influence.

Of these predictors, driver anger appears to be the most pertinent predictor of speeding behaviour in the present research, predicting speeding in all three samples. These results suggest that higher anger elicited specifically from driving situations is associated with more frequent speeding behaviour, and support previous research advocating the importance of anger in contributing to speeding behaviour (O'Brien et al., 2002). Future road safety policies and advertisement campaigns for speeding should focus on initiatives to reduce the incidence of drivers engaging in

speeding in order to "let off steam". This may extend to improving the road environment in order to increase traffic flow and reduce traveling time, and thus potentially reducing on-road anger.

Sensation seeking also appears particularly relevant to speeding behaviour, significantly predicting speeding in the student and metropolitan Sydney population samples. These results suggest that higher desire to experience new sensations is associated with more frequent speeding behaviour, and is consistent with previous research consistently identifying sensation seeking as a prominent factor associated with risky driving behaviour (Beirness, 1993; Dahlen et al., 2005; Horvath & Zuckerman, 1993; Zuckerman, 1994; Jonah et al., 2001; Beirness & Simpson, 1988). Future road safety policy and campaigns for speeding should focus on reducing the practice of speeding as a means of experiencing a "thrill" or a "rush". This may extend to the formulation of road safety campaigns that promote driving as, primarily, a mode of transport, and that challenge the perceived utility of speeding as fun. Vehicle advertisements depicting and promoting speeding as fun and thrilling should be further discouraged.

General perceived susceptibility also appears particularly relevant to speeding behaviour, significantly predicting speeding in the student and metropolitan Sydney population samples. These results suggest that lower perceived likelihood of having a crash, being fined, or incurring demerit points *in general* was associated with more frequent speeding behaviour. Future road advertising campaigns may need to be implemented in coordination with greater police enforcement throughout metropolitan Sydney in order to effectively reduce speeding behaviour.

Drink-Driving

For all three population samples examined in the present study, drink-driving was significantly predicted by: driver anger, road-unrelated illusory invulnerability, road-related specific illusory invulnerability, specific perceived susceptibility, perceived costs of not drink-driving, and peer influence.

Of these predictors, peer influence appears to be the most pertinent predictor of drink-driving behaviour in the present research, significantly predicting drink-driving in all three population

samples. The association between peer influence and intention to drink-drive suggests that greater peer influence is associated with more frequent drink-driving behaviour. Peer influence may be particularly relevant to young driver drink-driving given that many circumstances in which young drivers are vulnerable to drink-driving involve social drinking situations when they are with their friends. This also supports prior research indicating the importance of social norms to drink-driving (Gulliver & Begg, 2004) given that many circumstances in which young drivers might drink-drive involve social drinking situations when they are with their friends. Future road safety policy for drink-driving may require the inclusion of initiatives related to the social drinking habits of young people. Road safety campaigns should continue to promote negative images of drinking and driving for young people. In addition, road safety campaigns that encourage young drivers to prevent their friends from driving after drinking may effectively reduce drink-driving behaviour.

Driving While Fatigued

For all three samples examined in the present study, driving while fatigued was significantly predicted by: gender, road-related specific illusory invulnerability, specific perceived susceptibility, perceived costs of not driving while fatigued, perceived benefits of not driving while fatigued, and peer influence.

Of these predictors, specific perceived susceptibility appears particularly relevant to driving while fatigued behaviour, significantly predicting driving while fatigued in the student and metropolitan Sydney population samples. This suggests that lower perceived likelihood of having a crash, being fined, or incurring demerit points *specifically for driving while fatigued* was associated with more frequent driving while fatigued behaviour. Future road safety advertisement campaigns emphasizing the crash risk associated with driving while fatigued could be strengthened to ensure that young drivers view themselves as susceptible to fatigue-related road crashes.

Perceived benefits of not driving while fatigued also appears relevant to driving while fatigued behaviour, significantly predicting driving while fatigued in the student and rural NSW

population samples. This suggests that lower endorsement of the benefits of taking a break while driving to avoid the effects of fatigue (such as comfort or security and being refreshed for the upcoming drive) is associated with more frequent driving while fatigued behaviour. Results suggests that greater promotion of road safety advertising campaigns that encourage drivers to take breaks when driving for long hours and distances in order to avoid crashing (such as the "Stop-Revive-Survive" campaign) is warranted. Future road safety campaigns might also promote the personal security and comfort associated with taking a break in order to avoid driving while fatigued, if driving while fatigued behaviour is to be effectively addressed.

Not Wearing Seat Belts

For all three samples examined in the present study, not wearing seat belts was significantly predicted by: driver anger, sensation seeking, authority rebellion, road-unrelated illusory invulnerability, road-related general illusory invulnerability, road-related specific illusory invulnerability, general perceived susceptibility, specific perceived severity, perceived costs of wearing a seat belt, and perceived benefits of wearing a seat belt.

All of these factors significantly predicted seat belt use in only one of the three population samples examined in the present study. Given that there was no overlap of predictors, there are no universally useful predictors for not wearing seat belts. Thus, the predictors uncovered for not wearing seat belts may only be particularly relevant to the given population in which they have been examined.

The generalizability of student population results to the general population

Some results illustrated generalizability from the student sample to the general population sample. In particular, for both student population and metropolitan Sydney samples, peer influence significantly predicted drink-driving behaviour, specific perceived susceptibility significantly predicted driving while fatigued, and sensation seeking, driver anger and general perceived susceptibility significantly predicted speeding behaviour. Results also demonstrated some differences in terms of prediction of risky driving behaviours. For all behaviours, at least

one of the predictors found in the student population sample were different to those found in the metropolitan Sydney sample, supporting our previous findings (Fernandes & Job, 2003). Present findings suggest that a student sample gives some indication of the general driving population. Consequently, a student sample may be employed as a convenient sample of the young driver population if required; however, a general population sample would provide an ideal sample of this population.

Comparison of urban and rural data in the prediction of risky driving behaviour

Some results illustrate commonality between the metropolitan Sydney and rural NSW samples. In particular, for both metropolitan Sydney and rural NSW samples, driver anger and road-unrelated illusory invulnerability significantly predicted speeding behaviour, peer influence significantly predicted drink-driving behaviour, and perceived benefits significantly predicted driving while fatigued. Results also demonstrated some differences in terms of the prediction of risky driving behaviours. For all behaviours, at least one of the predictors found in the metropolitan Sydney sample were different to those found in the rural NSW sample. Results suggest that road safety advertisement campaigns may need to be tailored separately for metropolitan Sydney and rural NSW, for each risky driving behaviour.

The use of the Risky Driving Questionnaire

All four versions of the Risky Driving Questionnaire appear to be valid and reliable instruments for a university student sample, a metropolitan Sydney sample, and a rural NSW sample. In many instances, the factors found to significantly predict a particular behaviour have supported previous research in the area. For all three population samples examined in the present research, internal consistency levels were adequate for most Risky Driving Questionnaire scales constructed. Furthermore, test-retest correlations for each attitudinal, personality and behavioural intention scale in the Risky Driving Questionnaire were satisfactory for most scales constructed.

All four versions of the Risky Driving Questionnaire may be employed in further research of speeding, drink-driving, driving while fatigued, and not wearing seat belts more extensively

throughout the greater metropolitan Sydney area. Ongoing assessment of driver attitudes, beliefs and behaviours is required. In addition, the Risky Driving Questionnaires could be applied to new driver populations of interest. The Risky Driving Questionnaires may also be employed to ascertain the effectiveness of road safety campaigns.

The use of the Implicit Association Task

Consistently faster IAT performance was observed when associatively compatible categories (compared with associatively non-compatible categories) shared the same response, for each of the four risky driving behaviours. Despite these results illustrating that the IAT is sensitive to evaluative discriminations, findings do not illustrate a consistent relationship between the IAT-measured implicit attitudes and Risky Driving Questionnaire self-report measures. Observed correlations with the IAT effect for driving while fatigued were consistent with predictions that might have been made assuming predictive validity of the self-report measures and an association between attitudes and perceived risks. However, the other observed correlations were contrary to prediction, and relatively few correlations were observed. Further research is necessary to elucidate the relationship between implicit attitudes, explicit attitudes and behavioural intentions.

Future research

In relation to the IAT, as this study represents possibly the first application of the IAT to risky driving, further investigation into the sensitivity of the IAT is warranted. Further research is also necessary to elucidate the relationship between implicit attitudes, explicit attitudes and behavioural intentions. In addition, the adaptation of the IAT to other risky driving behaviours, as well as the investigation of other beliefs, may be considered for future research.

The present results suggest that future research must focus on the factors that influence individual risky driving behaviours. Specific attitudes and beliefs, in particular, require continued investigation. Despite the efficacy of most models examined, factors purported to influence seat

belt use, in particular, require further investigation, given that results revealed generally weak statistical regression models.

It must be noted that correlation does not equal causality. Because this research presents observational data, the causal sequence of events cannot be implied from the findings. Consequently, the next step in research is the manipulation (rather than observation) of the relevant underlying factors, and determination of their effects on the predicted risky driving behaviours, in order to assess the underlying causal mechanisms. This research provides the basis for which to manipulate these underlying factors.

CHAPTER ONE

BACKGROUND

The Road Safety Problem

Road trauma is recognized as a serious problem both in Australia and internationally. According to the Roads and Traffic Authority of NSW (2005), in 2004 there were more than 47,000 road crashes on NSW roads, with 510 persons killed and over 26,000 injured, incurring an estimated cost to the community of over $3,580 million. While a recent small decline in the number of road crashes and fatalities has been observed, these rates are consistent with those observed for previous years (see Roads and Traffic Authority of NSW, 2002; 2004).

A range of factors may potentially contribute to road crashes. The Roads and Traffic Authority of NSW (2006) have identified the effective management of traffic flow, as well as the development and maintenance of road infrastructure, as major approaches for promoting road safety, highlighting the contribution of the road environment to road crashes. Motor vehicle factors (for example, the quality of key motor vehicle components such as brakes and tyres) also influence the occurrence of road crashes. The manufacturing of safer vehicles in general (e.g. via the fitting of driver- and passenger-side airbags for all vehicles, and reinforced vehicle side panels) may also reduce the severity of a road crash (Job, 1995). Further, both the Roads and Traffic Authority of NSW (2006) and the Australian Transport Safety Bureau (2006) recognize human behaviour as a potential avenue for impact on road safety, and identify the need to promote safety awareness and knowledge in the community.

Risky Driving

Risky driving has been identified as an important contributor to road crashes, although its role is not comprehensively understood. Several studies have examined the relationship between risky driving and road trauma involvement. In his review of the literature, Jonah (1986) illustrated a

link between various risky driving behaviours and road trauma. Evans & Wasielewski (1982) operationalised risky driving in terms of gap acceptance, with headway gaps of less than one second defined as risky, and gaps equal to or greater than one second defined as not risky. Drivers who exhibited a history of crashes on their driving records were more likely to leave headway gaps of less than one second than drivers with no previous crash history. More recently, Iversen (2004) found that people who had been involved in at least one car crash over the last one-year period engaged in more speeding, drink-driving and reckless driving, as well as lower use of seat belts, over the same period.

The focus of the present research will be on four risky driving-related behaviours: speeding, drink-driving, driving while fatigued, and not wearing seat belts.

Speeding – Speeding is estimated to be a substantial contributor to road crashes in NSW (Roads and Traffic Authority of NSW, 2002; 2004; 2005). The Roads and Traffic Authority of NSW (2005) estimated that, in 2004, at least 37% of all fatal crashes involved speeding. Speeding has been found to increase both the frequency (Vernon, Cook, Peterson & Dean, 2004; Wagenaar, Streff & Schultz, 1990) and severity of road crashes (Fildes & Lee, 1993; Moore, Dolinis & Woodward, 1995). A mean increase in speed of 1 km/h has been associated with a 3% greater risk of a crash involving an injury and a 4–5% greater risk of a fatal road crash (Fildes & Lee, 1993). In addition, Blows, Ameratunga, Ivers, Lo & Norton (2005a) found that participants who reported higher levels of speeding and racing for excitement over the last one-year period were up to four times more likely to be injured in a car crash while driving over the same period. Evidence suggests that driving at higher speeds results in decreased control over the vehicle while driving (Endo, Ukawa, Sanada & Kitagawa, 1999).

Drink-driving – Drink-driving is seen as a major contributor to road crashes (Williamson, 2000; Roads and Traffic Authority of NSW, 2002; 2004; 2005). The Roads and Traffic Authority of NSW (2005) estimated that, in 2004 drink-driving contributed to approximately 20% of all fatal crashes. Evidence suggests that alcohol adversely affects driving, specifically lower concentration levels, slowed reaction time, and poorer decision-making skills (Deery & Love, 1996; West, Wilding, French, Kemp & Irving, 1993).

Driving while fatigued – Driving while fatigued is estimated to contribute substantially to crashes in NSW (Roads and Traffic Authority of NSW, 2002; 2004; 2005). The Roads and Traffic Authority of NSW (2005) estimated that, in 2004 at least 17% of all fatal crashes involved driver fatigue. Fatigue may result from sleep loss (whereby alertness and performance may be diminished by lack of sleep), which, in turn, may produce poorer decision-making skills, lower concentration levels, and slowed reaction time (Job & Dalziel, 2000; Dalziel & Job, 1995). Clearly, driving longer hours than the average person has the potential to impact upon a driver's attentional and cognitive resources. In fact, research has illustrated that the effects of fatigue are as detrimental to driving performance as the effects of drink-driving (Arnedt, Wilde, Munt & MacLean, 2001).

Not wearing seat belts – The Roads and Traffic Authority of NSW (2005) estimated that, in 2004 at least 18% of motor vehicle occupants killed were not wearing available seat belts. The failure to use seat belts when driving is unlikely to directly cause road crashes – however, it places the driver of the car at a greater risk of injury in the event of a road crash. Research has shown seat bet use to be an effective injury prevention measure in the event of a road crash (Blows, Ivers, Connor, Ameratunga, Woodward & Norton, 2005b; Ball, Kirkpatrick & Brenneman, 2005; Iversen, 2004; Evans, 1987).

Determinants of Risky Driving

Given that risky driving is a major contributor to road trauma, reducing levels of risky driving should reduce the incidence of crashes and injury on the roads. However, the successful manipulation of risky driving requires a good understanding of contributing factors. Various factors that have been suggested to influence risky driving are reviewed in this section. The Health Belief Model (HBM; Janz & Becker, 1984) is used an initial framework because it has been effectively applied to an extensive range of health contexts (see Conner & Norman, 1996) including risky driving (Lajunen & Rasanen, 2004; Yagil, 2000). Additional factors that appear to be important are also considered. The HBM proposes that a person's decision whether or not to engage in safe behaviour (i.e. not speeding, not drink-driving, not driving while fatigued, and

wearing seat belts) is determined by four dimensions: the *perceived susceptibility* to, and *perceived severity* of, the consequences of a risky behaviour, as well as the *perceived benefits*, and *perceived costs*, of the alternative safety behaviour (Becker, 1974).

Perceived risk

Perceived risk has received considerable attention as a determinant of risky driving. Perceived risk is a principal concept in a number of important and widely used theories of health behaviour, including the HBM. Perceived risk may be understood to include the *perceived susceptibility* to, and *perceived severity* of, the consequences of performing a risky behaviour (or not performing a safe behaviour). For risky driving, this relates to the perceived risk of having a car crash, incurring demerit points, or being fined while driving. Evidence suggests that risk perception is pivotal to behaviour change (for review, see Helweg-Larsen & Sheppard, 2001).

Illusory invulnerability is an aspect of risk perception that may also be relevant to risky driving. Illusory invulnerability refers to people's tendency to expect a better future than their peers (Chua & Job, 1999; Weinstein & Klein, 1996; Job, 1990a; Weinstein & Lyon, 1999; DeJoy, 1989). Illusory invulnerability is a robust effect which extends to a number of road safety issues. It has been shown that most people see themselves as less likely than average to be injured or killed in a car crash (Job, 1990a), or be fined for drink-driving (Prabhakar et al., 1996), and less frequently running red lights (Morgan & Job, 1995). Males consistently exhibit greater illusory invulnerability than females (DeJoy, 1992; Job, 1990a; 1993; Prabhakar et al., 1996), and this may contribute to the over-representation of males in road crashes.

Another self-enhancing bias which may be relevant to road safety is peoples' tendency to see themselves as better than average drivers (Matthews & Moran, 1986; Lee & Job, 1992; Lee, Prabhakar & Job, 1993; Job, 1990a; 1990b; 1999; Svenson, 1981).

Perceived benefits and costs

People may engage in risky driving because the risky driving behaviour has a value to them. Risk utility, the value or usefulness of a risky behaviour, has been suggested as another important factor in risky driving (Jonah, 1986). For example, drivers may engage in tailgating because it allows them to get to an appointment on time. Further, the risk itself may operate as a utility. Thus, drivers may engage in tailgating because it is exciting (see Job, 1999 and Prabhakar, Lee & Job, 1996). Taking longer to get to one's destination may be a substantially greater cost for situations involving drink-driving and driving while fatigued, compared with (say) wearing a seat belt, therefore thorough research into time urgency is warranted.

Sensation seeking is a trait describing the tendency to seek new, different, and intense sensations and experiences (Zuckerman, 1994). A defining characteristic of sensation seeking is the willingness to accept risks for the sake of such experiences, and, as such, sensation seeking is closely linked to risk taking (Jonah, 1986). Indeed, the "thrill" of a risk may provide a sensation-seeking experience. Zuckerman (1994) suggests that sensation seeking is the most common purpose of risky driving for young men, aged 16-20 years. Sensation seeking has been consistently identified as a prominent factor associated with risky driving behaviour (Zuckerman, 1994; Jonah et al., 2001; Beirness, 1993; Beirness & Simpson, 1988) with high sensation seekers more likely to speed, not wear seat belts, and drive after drinking (Jonah et al., 2001; Beirness & Simpson, 1988). Sensation seeking appears relevant to speeding (Jonah, 1997) and drink-driving (van Beurden, Zask, Brooks & Dight, 2005) because of the feelings associated with these behaviours; however, it may not be as pertinent to driving while fatigued and seat belt wearing.

Addressing anger or "letting off steam" may be a further benefit of risky driving. Driver anger has been conceptualised as a personality trait similar to trait anger (Deffenbacher, Oetting & Lynch, 1994), which reflects a broad predisposition to experience anger more frequently and intensely across a range of driving situations (Spielberger, 1988). A recent study of young drivers showed that anger was the only mood state associated with increased risky driving (Arnett, Offer & Fine, 1997).

Rebellion against authority figures such as parents and police officers may contribute to a propensity for breaking traffic laws. Consequently, risky driving may offer a potential avenue for

authority rebellion. Authority defiance has not yet been sufficiently examined as a predictor of risky driving behaviour.

Social norms

Although the HBM does not include social norms, they are recognized as a key influence of risk behaviour in the Theory of Planned Behaviour (TPB; Ajzen, 1985). Social norms refer to a person's beliefs about whether significant others think they should engage in a risky behaviour (Connor & Sparks, 1996). Teens are an important source of social influence on adolescent risk behaviors (Donovan, 2004; Ennett & Bauman, 1994). In a study examining the self-reports of senior high school students, Ellickson & Hayes (1991) found that peer alcohol use and peer marijuana use were two of the three significant predictors of initial alcohol use. Peer influence may also be a factor in driving (Simons-Morton, Lerner & Singer, 2005). Peer influences may include direct encouragement of risky driving behaviour (for example, urging the driver to drive fast), or indirect encouragement of risky driving (as when a driver drives fast because he or she perceives that the passenger(s) would view such driving behaviour as desirable (Simons-Morton et al., 2005).

Gender

Males consistently exhibit greater risky driving, and road trauma involvement, compared with females (Job, 1990b; Prabhakar et al., 1996). For example, Harre, Field & Kirkwood (1996) found that males were significantly more likely than females to report engaging in speeding, drink-driving, and breaking rules associated with being on a restricted licence. Male drivers have also been observed to engage in greater speeding behaviour (Wasielewski, 1984), and greater tailgating behaviour (Evans & Wasielewski, 1983), compared to female drivers. Nonetheless, some research suggests that the risky driving behaviour of females is becoming increasingly similar to that of male drivers (Moore, 1994).

Age

Research has demonstrated significant differences in risky driving behaviour between specific driver age groups (Jonah, 1990; Begg & Langley, 2001). In particular, young drivers are more likely to engage in risky driving compared with older drivers (Jonah, 1986; Job, 1999; Williams, 1998; Cameron, 1985; Prabhakar et al, 1996). This issue will be discussed further in the later "Young Drivers" sub-section of this report.

The Possibility of Different Factors Predicting Different Risky Driving Behaviours

It may be debated whether all risky behaviours are sufficiently similar to be explained by similar factors. Motivation to engage in different risky behaviours may vary considerably. For example, a decision to have unprotected sex may result from a range of factors that may not influence a decision to speed while driving. Similarly, the reasons for a driver engaging in one risky driving behaviour may be different from the reasons for engaging in another risky driving behaviour. For example, the factors which contribute to a person's decision to speed may not be the same factors that contribute to their decision to drink-drive.

It is naïve to assume that the same group of factors contribute to the entire range of risky driving behaviours that takes place on our roads. Thus, there is a need to investigate the specific factors that influence individual risky driving behaviours. Recent studies have illustrated the importance of investigating attitudes and beliefs that are *specific* to each individual risky driving behaviour, rather than *general* road safety attitudes and beliefs (Fernandes & Job, 2003; Fernandes et al., 2004; Iversen, 2004). Sutton (1998) argues that a general attitude measure is a weak predictor of a specific behaviour, implying that the investigation of attitudes specific to individual driving behaviours (rather than a general measure) would allow for the reliable prediction of those specific behaviours.

Furthermore, countermeasures for risky driving are often extrapolated from one behaviour to another, without sufficient justification. For instance, interventions based on eliciting fear have been utilized to curb a range of risky driving behaviours in NSW and other states. Thus, in road safety advertising, we see similar fear-eliciting campaigns for speeding, drink-driving, and not

wearing seat belts – despite insufficient research into the assumed similarity of factors that influence these behaviours.

Until recently, no research has directly examined the differences between risky driving behaviours, in terms of precipitating factors. Our preliminary research (Fernandes & Job, 2003; Fernandes et al., 2004) examined a range of possible predictors of risky driving in relation to a range of risky driving behaviours, in order to investigate whether predictive factors for various risky driving behaviours differed from behaviour to behaviour (for example, drink-driving vs. speeding vs. non-use of seat belts). Results indicated that *different* factors predict *different* risky driving behaviours. For example, speeding was predicted by the authority rebellion scale, while drink driving was predicted by sensation seeking and illusory invulnerability.

A brief review of factors shown to influence the four risky driving behaviours under examination for the present research further highlights the possibility of different factors predicting different risky driving behaviours. It must be noted that a complete lists of factors has not been presented for each behaviour:

Speeding – Speeding is estimated to be a substantial contributor to road crashes in NSW (Roads and Traffic Authority of NSW, 2002; 2004; 2005). Sensation seeking has been shown to be a significant predictor of both observed speeding (Jonah, 1997) as well as self-reported speeding behaviour (Jonah et al., 2001). Anger has also been shown to contribute to self-reported speeding behaviour (O'Brien et al., 2002). Adams-Guppy & Guppy (1995) found that drivers more likely to speed also more likely to view being on time for appointments as desirable, while Lee et al. (1993) showed that younger drivers were more likely than older drivers to report speeding when late for an appointment, and to save time.

Drink-driving – Alcohol has been suggested as a major factor involved in road crashes, particular because evidence suggests that it adversely affects driving (Williamson, 2000; Roads and Traffic Authority of NSW, 2002; 2004; 2005). Sensation seeking (Jonah et al., 2001; Jonah, 1997; van Beurden et al., 2005) and aggression (Gulliver & Begg, 2004) have been shown to be significant factors associated with self-reported drink-driving behaviour. In addition, the influence of peer

influence on self-reported drink-driving has been documented (Finken, Jacobs & Laguna, 1998; Gulliver & Begg, 2004), while cross-sectional research also indicates a relationship between the negative consequences of drink-driving and observed drink-driving behaviour (McCarthy, Pedersen & Leuty, 2005).

Driving while fatigued – Driving while fatigued is estimated to be significantly involved in crashes in NSW (Roads and Traffic Authority of NSW, 2002; 2004; 2005). In a cross-sectional study examining the relationship between illusory invulnerability, self-reported fatigue and crash involvement among taxi drivers, Dalziel & Job (1997) found that most drivers considered their driving abilities as superior to the average taxi driver. Research has also found that high sensation-seekers are more likely to report falling asleep while driving (Thiffault & Bergeron, 2003; Verwey & Zaidel, 2000). Furthermore, in a longitudinal study examining the relationship between simulated driving while fatigued and various personality measures, Matthews & Desmond (1998) found a significant correlation between aggression and driving while fatigued.

Not wearing seat belts – The failure to use seat belts when driving places passengers in the car at a greater risk of injury in the event of a road crash. The Roads and Traffic Authority of NSW (2005) estimated that, in 2004, at least 18% of motor vehicle occupants killed were not wearing available seat belts. Despite this, minimal research exists regarding the factors which influence seat belt use. In a cross-sectional study examining driver attitudes and beliefs toward seat belt use, Chaudhary, Solomon & Cosgrove (2004) found that participants who had a higher perceived risk of being fined for not wearing a seat belt generally reported higher seat belt use. In another cross-sectional design, Svenson, Fischhoff & MacGregor (1985) report a positive correlation between illusory invulnerability and self-reported seat belt use. Results from the same study also observe a significant correlation between seat belt use and the extent to which seat belts are judged to be convenient to use.

Given the range of factors implicated in the prediction of risky driving, it is necessary to examine such factors together, in order to tease apart the roles of different factors and identify which factors best predict which *individual* risky driving behaviour. Clearly, identifying the causal factors associated with road crashes must remain the optimal goal – however, the investigation of

predictive factors worthy of experimental manipulation for specific risky driving behaviours is an important first step to realising this goal.

Young Drivers and Risky Driving

Younger drivers are over-represented in crashes among all classes of road user, compared with other age groups (Jonah, 1986; Prabhakar et al., 1996; Job, 1999). In 2004 road fatalities accounted for 26% of all deaths for 20-24 year olds in NSW (Roads and Traffic Authority of NSW, 2005), and 31% of all deaths for 15-19 year olds (Roads and Traffic Authority of NSW, 2005). These rates are consistent with previous rates (Roads and Traffic Authority of NSW, 2001; 2002; 2004; Prabhakar et al., 1996).

While road safety countermeasures have been effective in reducing the incidence of road injury and death over the past 20 years, the difference between the rates for young drivers and all other age groups has remained the same (Williamson, 2000). Such general improvements, it seems, have not influenced the young driver problem. Young driver safety is therefore in need of targeted approaches to reduce the difference in injury rates between younger and older drivers. The investigation of young drivers is necessary to identify the factors that are particularly relevant to them. A comparison of the factors involved in crashes for younger versus older drivers is necessary for road safety researchers to identify and isolate the factors that make crashes more likely for young drivers. At present, there exists minimal research investigating systematic differences between younger versus older drivers (Blows et al., 2005a; Finn & Bragg, 1986). A sub-group of young drivers may be responsible for high crash rates (Williams, 1998). At present, however, this sub-group is not clearly identified or characterized, and so interventions are likely to target young people as a group.

A complex constellation of factors is likely to contribute to the over-representation of young drivers in road crashes (Cameron, 1985; Job, 1999). The lack of driving experience in adolescent drivers is seen as a major contributor, with an important consequence believed to be an inadequate ability to cope with deviations from “normal” driving conditions (such as differential speed adjustments in traffic flow and varying weather conditions) (Job, 1999). Furthermore,

young people with limited experience engage in risky driving behaviours without fully understanding the consequences of their actions (Bell & Bell, 1993). Exposure may be another contributing factor, with young people involved in more crashes at nighttime (and more specifically, Friday and Saturday nights, which are associated with higher crash rates), compared to older drivers (Roads and Traffic Authority of NSW, 2005; Lee et al., 1993).

Risky driving is a major determinant of the over-involvement of young drivers in road crashes (Turner, McClure & Pirozzo, 2004; Williams, 1998; Cameron, 1985; Jonah, 1986; Prabhakar et al, 1996). Compared with older drivers, young drivers are more likely to drive fast, tailgate, engage in risky overtaking, allow too little time to merge, and fail to give way to pedestrians (Jonah, 1986; Job, 1999). Clarke, Ward and Truman (2005) found risky driving to be a greater contributor to road crashes than driver skill deficits for younger drivers.

A range of factors (including lack of experience) may contribute to the greater risky driving of young people. Perceived risk appears to be important to young drivers, in that they display lower acknowledgement of risky driving situations, compared with older drivers (DeJoy, 1989; Finn & Bragg, 1986; Prabhakar et al., 1996). Although illusory invulnerability has been shown to be greater in older than younger drivers (DeJoy, 1989; Job, 1990b), further research is required to understand the causal sequence between illusory invulnerability and road crashes.

The perceived benefits of risky driving behaviours may differ between younger and older drivers. Younger drivers have been shown to have stronger preference for fast cars than older drivers (Jonah & Dawson, 1987). Furthermore, Lee et al. (1993) showed that younger drivers were more likely than older drivers to report speeding when late to save time, speeding as a source of fun, venting anger upon other drivers, and taking risks ‘for the sake of it’. The social utility of a risk may also be a more important factor for younger drivers, because young drivers like to impress their friends, many of whom approve of risk taking (Prabhakar et al., 1996). Indeed, gaining acceptance (or maintaining acceptance) within a peer group has been outlined as a major utility of risky driving for young people (Jessor, 1998). Zuckerman (1994) suggests that sensation seeking is the most common purpose of risky driving for young men. Furthermore, Jessor (1998) suggests that a major utility of risky driving for young drivers is an expression of

independence and opposition to adult authority and conventional society (which is less relevant for older people). While young people may engage in risky driving for any of the reasons outlined above, systematic investigation of the relative importance of these factors for different behaviours in young drivers is yet to be comprehensively examined.

Objectives

The present program of cross-sectional surveys aimed to:

Objective 1: Examine the attitudes, beliefs and behaviours of young drivers in relation to four risky driving behaviours (speeding, drink-driving, driving while fatigued, and not wearing seat belts).

Objective 2: Assess whether young driver beliefs and attitudes to road safety differ across the four risky driving behaviours, and whether there are different predictors for the different behaviours.

Objective 3: Assess whether results found in a student population can be generalized to the greater metropolitan Sydney area.

Objective 4: Investigate metropolitan Sydney/rural NSW differences in the prediction of the four risky driving behaviours.

Objective 5: Develop four versions of a Risky Driving Questionnaire, to assess driver attitudes, beliefs, personality factors and behavioural intentions for the four behaviours. This represents a secondary aim, undertaken to pursue other aims in this study.

Objective 7: Validate the use of the four versions of the Risky Driving Questionnaire employing four versions of a Risky Driving Implicit Association Test.

Objective 6: Develop four versions of a Risky Driving Implicit Association Test, one for each of speeding, drink-driving, driving while fatigued, and not wearing seat belts behaviours.

Desired Outcomes

1. A separate list of predictors for each risky driving behaviour (for different populations, if relevant), to be used to guide programs for behaviour change, for each behaviour.

2. Four valid and reliable Risky Driving Questionnaires.

3. Four Risky Driving Implicit Association Tests.

CHAPTER TWO

METHODOLOGICAL ISSUES

Self-Report Measurement Issues

Self-report is often employed to measure driving behaviour, attitudes and beliefs (e.g. Blows et al., 2005a; Fernandes & Job, 2003; Ulleberg & Rundmo, 2002; Prabhakar et al., 1996; Parker, Reason, Manstead & Stradling, 1995; Jonah, 1986). However, it may be argued that researchers cannot confidently know whether the self-report data they have gained are valid. It has been suggested that self-report data may be biased, at least to some extent, because some participants engage in socially desirable responding (Paulhus, 1984; 1989; Lajunen et al., 1997; Barrick & Mount, 1996). Most simply, socially desirable responding can be described as a tendency to give "right" answers. Participants' responses may be influenced by their beliefs and perceptions of the researchers' expectations, and further by the desire to protect their own image (Anastasi & Urbina, 1997).

The possibility that participants may engage in socially desirable responding is particularly pronounced when there are clear social norms attached to the factor that is being measured, and this appears relevant to road-safety behaviours, attitudes and beliefs.

Self-reported driving behaviour may be biased by inaccurate reporting. This would generally manifest in underreporting of risky driving behaviour for fear of legal and social consequences. For example, negative images of fast drivers who are inconsiderate of other road users may cause some drivers to moderate their self-reported speeding behaviour in order to avoid being similarly categorised (Corbett, 2001). However, fast driving may also be viewed as "good", "valued" and "highly skilled" (Corbett, 2001, p.146), and people may not want to report travelling too slowly, to avoid being viewed as unconfident, unpredictable, short-sighted, old, low-skilled and unsafe drivers. Nonetheless, self-reported measures of driving behaviour are employed frequently (e.g.

Ulleberg & Rundmo, 2002; Prabhakar et al., 1996) because observation of driving behaviour is extremely time consuming and costly.

Nonetheless, many studies have supported the validity of self-report data for investigating road safety issues (e.g. Ulleberg & Rundmo, 2002; Prabhakar et al., 1996; Aberg, Larsen, Glad & Beilinsson, 1997; Parker et al., 1995). In a study investigating the effects of fatigue on driving performance and crash involvement among taxi drivers (Dalziel & Job, 1997), participants were asked to complete a questionnaire examining attitudes and behaviours related to taxi driving. Self-reported crash details were checked against company insurance records, and results showed that 90% of all recorded crashes were reported in the questionnaire. Additionally, Parker et al. (1995) supported the validity of self-report data based on a review of studies that have assessed the relationship between self-reported crash involvement and actual crash involvement (as determined from police records).

Behavioural intention is often employed as a surrogate for driving behaviour measures in road safety research (Parker, et al. 1992; Parker, Lajunen & Stradling, 1998; Fernandes & Job, 2003), and data suggests that intentions to engage in risky driving behaviours are reasonably accurate surrogates of archival measures (Arthur, Tubre, Day, Sheehan, Sanchez-Ku, Paul, Paulus & Archuleta, 2001). West, French, Kemp & Elander (1993) examined the relationship between self-reported intended driving speed and observations of speeding behaviour (secretly monitored by in-car observers). Results showed a significant correlation between self-reported speeding and observed driving speed. A similar study by Aberg et al. (1997) reported a correlation of 0.36 between self-reported speed and observed speed.

Approaches to Controlling Bias in Self-Report

While response bias is difficult to eliminate entirely, various features may be built into self-report instruments to control for response bias. For example, instructions may be written to encourage participants to respond frankly (Anastasi & Urbina, 1997). In the present study, participants were asked to respond accurately and honestly to all questions. Furthermore, truthful and open responding may be gained from participants if they are convinced that it is

advantageous to do so (Anastasi & Urbina, 1997). Consequently, in the present study, the increased public scrutiny on road injuries and fatalities, particularly those involving young drivers, was emphasized when explaining the nature of the study to participants aimed at reducing road trauma.

The "bogus pipeline" technique has also been employed as a method of reducing participant bias in self-report data (Jones & Sigall, 1971). This technique involves reducing motivation for socially desirable responses by telling participants that their responses will be verified. For example, in road safety research, participants are told that their responses may be checked against official records. In fact, when archival records *are* also employed, this technique becomes a validation study rather than a bogus exercise. The bogus pipeline technique has been shown to be effective in a range of areas involving attitude research (see Roese & Jamieson, 1993 for a review).

One of the most widely accepted methods employed to allow statistical control of socially desirable responding is by the inclusion of an appropriate measure of participants' tendency to respond in a socially desirable manner. If scores on this measure significantly correlate with other attitudinal or behaviour measures, social desirability scores may be employed as covariates in statistical analyses. When scores on a social desirability measure do not correlate significantly with relevant outcome measures, this technique is not necessary.

The Implicit Association Task

The dependence on self-report measures to provide information about attitudes is a limitation of current research in this area. The Implicit Association Test (IAT; Greenwald et al., 1998) provides a method for testing the validity of self-reported attitudes, and may potentially represent a valid non-self-report measure of driver attitudes.

The IAT assesses the association between a *target-concept* and an *evaluation*. Table 1 presents a schematic illustration of all five stages in the speeding-related IAT. The procedure starts with introduction of the target-concept discrimination. For the example of speeding behaviour, this

initial discrimination is to distinguish words that are recognisable as speeding- or risky driving-related from ones recognisable as sticking to the speed limit- or safe driving-related. This and subsequent discriminations are performed by assigning one category to a response by the left hand and the other to a response by the right hand. Secondly, an attribute dimension is introduced, also in the form of a two-category discrimination. For all present IAT tasks, the attribute discrimination was evaluation, represented by the task of categorising words as good/positive versus bad/negative. The two discrimination tasks then are superimposed in the third stage, so that (for example) participants respond by pressing a left key if the stimulus is a *speeding-related or a negative word*, and by pressing a right key if the stimulus is a *safe driving-related or a positive word*. In the fourth stage, the respondent learns a reversal of response assignments for the initial speeding-safe driving discrimination, and the fifth stage combines the attribute discrimination (not changed in response assignments) with this reversed discrimination (so that participants would respond by pressing a left key if the stimulus was a *safe driving-related or a negative word*, and a right key if the stimulus was a *speeding-related or a positive word*) (Greenwald et al., 1998). Please see http://www.projectimplicit.net/ for further information regarding the IAT procedure.

Table 1: Schematic illustration of the "compatible combinations before non-compatible" speeding-related IAT (template employed from Greenwald et al., 1998). Categories for all discriminations are assigned to a left or right response, indicated by the black circles on the third row. The figure employs stimuli from the "speeding-related" IAT, with correct responses indicated as open circles. Target-concept words are presented in upper case, while evaluation words are presented in lower case. For the "non-compatible combinations before compatible" speeding-related IAT, Stages 1 & 3 will be swapped with Stages 4 & 5, respectively.

STAGE	**1**	**2**	**3**	**4**	**5**
Task Description	*First Concept Discrimination Task*	*Evaluation Discrimination Task*	*First Combined Task*	*Second (Reversed) Concept Discrimination Task*	*Second (Reversed) Combined Task*
Task Instructions	● **SPEED** **SAFE** ●	● **bad** **good** ●	● **SPEED** ● **bad** **SAFE** ● **good** ●	**SPEED** ● ● **SAFE**	**SPEED** ● ● **bad** ● **SAFE** **good** ●

Sample Stimuli	o FAST SLOW o o SPEED o RACE BRAKE o SAFE o	peace o love o o hatred o agony happy o o nasty	o hatred SLOW o o FAST love o peace o o SPEED	SPEED o FAST o o SLOW RACE o o BRAKE o SAFE	love o peace o o SLOW FAST o SPEED o o hatred

If the target categories are differentially associated with the attribute dimension, the participant should find one of the combined tasks (that is, the third or fifth stage) to be considerably easier than the other (Faunce & Job, 2000). That is, performance should be faster for compatible combinations of words, compared with non-compatible combinations, which provides the measure of implicit attitudinal difference between the target categories. An *IAT effect* is defined as the mean latency difference between these two conditions (non-compatible minus compatible), and is designed to be a measure of participants' relative implicit attitudes towards the categories under investigation (Greenwald et al., 1998). So, faster performance in the "sticking to speed limits/safe driving + good" condition than in the "speeding/risky driving + good" condition is taken to indicate a stronger association between sticking to the speed limit and positive meaning than between speeding and positive meaning, and thus, a more positive attitude toward sticking to the speed limit than speeding.

Thus, the IAT represents a hidden measure of attitudes: it is used to measure the relative strength of pairs of associations (via differences in speed of reaction to stimulus words), and in such a way that it is not obvious to participants that attitudes are being assessed at all. It is important to note, however, that the IAT can only be employed to assess the validity of self-reported attitudes. Given that the IAT instructs participants to make evaluative judgments about whether something is positive or negative (as in self-reported attitudes), the IAT cannot be employed to validate road safety beliefs and risky driving behaviours.

The IAT has been successfully employed to assess implicit attitudes associated with obesity (Placanica, Faunce & Job, 2002), homosexuality (Steffens & Buchner, 2003), smoking (Swanson, Rudman, & Greenwald, 2001), and social anxiety (Tanner, Stopa & Houwer, in

press). Furthermore, the validity of the IAT has been illustrated in a variety of settings. For example, Greenwald et al. (1998) employed the IAT to demonstrate expected differences between Japanese Americans and Korean Americans in implicit attitudes towards their respective racial groups. In addition, the IAT has recently been found to be sensitive to behavioural change, with Teachman et al. (2001) finding that an IAT assessing implicit attitudes towards spider-related stimuli was sensitive to the effects of treatment for spider phobia. Further, and perhaps most importantly, the ability of the IAT to circumvent response bias was shown by Kim and Greenwald (1998), who found that participants were unable to fake desired patterns of responding on the IAT, even when explicitly instructed to do so by the researcher.

Since the IAT appears to be a good measure of attitudes, and attitudes appear to significantly predict behaviour, it is hypothesized that the IAT would significantly predict behaviour. However, this has not been comprehensively examined. Furthermore, the ability of the IAT to successfully measure implicit attitudes in the field of road safety has yet to be examined. The IAT appears critical to this field given that much road safety research relies on self-report data. The present research will attempt to redress this issue. Given the social stigma attached to behaviours such as speeding and drink-driving, the IAT appears to be a good tool to have in an area where socially desirable responding has been a cause for concern. We expect to find evidence for a valid, unbiased measure of the relevant attitudes that can be employed to assess and select valid existing self-report measures.

CHAPTER THREE

STUDY 1: INVESTIGATING THE ROAD SAFETY ATTITUDES AND BELIEFS OF YOUNG DRIVERS FOR THE PREDICTION OF RISKY DRIVING BEHAVIOUR

Study 1 examined a range of demographic factors, personality factors, attitudes and beliefs in the prediction of speeding, drink-driving, driving while fatigued, and not wearing seat belts, for young drivers aged 16-25 years, by the use of a Risky Driving Questionnaire. This study examined whether young driver beliefs and attitudes differ across a range of risky driving behaviours, and whether there are different predictors for different behaviours.

Method

Participants and sampling

215 first-year School of Psychology students from the University of NSW (who were required to be 25 years of age or less, and to hold a current NSW drivers license) were recruited via the UNSW School of Psychology "Experimetrix" sign-up webpage (advertised as "a study on driver attitudes"), and course credit was gained for participation.

Participants were randomly assigned to one of two groups (one received a survey on speeding and drink-driving, the other a survey on not wearing seat belts and driving while fatigued), by handing out corresponding questionnaires consecutively. That is, for every two participants, researchers administered a 'speeding/drink-driving' questionnaire, followed by a 'not wearing seat belts/driving while fatigued' questionnaire.

The sample for speeding and drink-driving behaviours included 108 participants (60.2% females; mean age = 19.0; SD age = 1.30). The sample for driving while fatigued and not wearing seat belts behaviours included 107 participants (60.7% females; mean age = 19.0; SD age = 1.30).

Materials

Participant Information Sheet

The Participant Information Sheet is presented in Appendix A. The Participant Information Sheet described the research as a study of "drivers' attitudes toward various risky driving behaviours" that aimed to "better understand both the risks young people take on the road, as well as the ways in which young motorists can be best informed of the dangers associated with performing risky driving behaviours". Participants were also told that the researchers wished to check their driving record if participants gave their permission.

Participants were informed that any information obtained from the study would remain confidential, except as required by law. It was specified that only grouped data results may be discussed with the University of NSW, the NSW Injury Risk Management Research Centre, and the Motor Accidents Authority (primary funding body), and presented to the scientific community (e.g. for journal publications), so that individual participants cannot be identified.

Participants were informed that their participation in the study was entirely voluntary, and that they were free to withdraw their consent at any time. Details about the procedure for lodging complaints or asking any further questions were provided. Affiliation with the University of NSW, the NSW Injury Risk Management Research Centre, and the Motor Accidents Authority was indicated.

Consent Form

The Consent Form is presented in Appendix B. Participants signed a Consent Form if they were willing to participate in the study. Participants were also asked to consent to providing access to their driving records, with a space given for providing a Drivers' License Number. Affiliation with the University of NSW, the NSW Injury Risk Management Research Centre, and the Motor Accidents Authority was indicated.

Revocation of Consent Form

The Revocation of Consent Form is presented in Appendix C. Participants were given the Revocation of Consent Form to read, sign, and return if they wanted to withdraw their consent. Affiliation with the University of NSW, the NSW Injury Risk Management Research Centre, and the Motor Accidents Authority was indicated.

Risky Driving Questionnaire

Complete versions of the four questionnaires employed for Study 1 (that were packaged into the two surveys) are reproduced in Appendices D-G. The four questionnaires were packaged as two survey versions in order to minimise the effects of fatigue on performance. Speeding and drink-driving behaviours were packaged as one survey version, and not wearing seat belts and driving while fatigued behaviours were packaged as another survey version.

For each of the four risky driving behaviours examined, questions were presented in eleven sections that are described below in the order of administration.

Section One: Illusory Invulnerability

Table 2 shows the illusory invulnerability questions included in the "speeding" questionnaire version. Participants rated the chances that each of six events would happen to them, compared with peers of the same age and gender. Responses were made on a fully-labelled 5-point scale, with the response options: "Much lower than average", "Lower than average", "Same as average", "Higher than average", and "Much higher than average".

Two **road-related specific illusory invulnerability** questions related to being fined and having a crash due to one of the four driving behaviours under investigation. Two **road-related general illusory invulnerability** questions related to general driving issues that were not specific to the individual behaviours, and two **road-unrelated illusory invulnerability** questions related to events other than driving. The latter four questions were constant for all versions of the

questionnaire. All questions were developed for the present research program; therefore no parametric properties are available in the literature.

Table 2: Road-related specific, road-related general, and road-unrelated illusory invulnerability questions from the "speeding" questionnaire version.[1]

Road-Related Specific Illusory Invulnerability questions
Compared to the average driver of your age and gender, how would you rate your chances of *being fined for speeding*?
Compared to the average driver of your age and gender, how would you rate your chances of *being injured in a road crash while you are speeding*?
Road-Related General Illusory Invulnerability questions
Compared to the average driver of your age and gender, how would you rate your chances of *being fined while driving*?
Compared to the average driver of your age and gender, how would you rate your chances of *being injured in a road crash while driving within the next 2 years*?
Road-Unrelated Illusory Invulnerability questions
Compared to the average driver of your age and gender, how would you rate your chances of *staying healthy during next winter*?
Compared to the average driver of your age and gender, how would you rate your chances of *developing cancer*?

Section Two: Perceived Susceptibility, General Perceived Severity, Perceived Benefits, Perceived Costs, and Peer influence

Table 3 shows the peer influence, general perceived severity, general perceived susceptibility, specific perceived susceptibility, perceived costs, and perceived benefits questions included in the "speeding" questionnaire version. Participants were asked to rate the extent to which they agree or disagree with a range of statements (26 questions for the 'driving while fatigued' questionnaire version, and 23 questions for each of the other three questionnaire versions)

[1] Road-related specific illusory invulnerability questions were tailored to the other risky driving behaviours for each corresponding questionnaire version. Questions in this section were mixed-up for presentation in the questionnaire.

written in first person narrative. Responses were made on a 7-point scale, anchored with three verbal labels of "Strongly Agree" (1), "Neutral" (4), and "Strongly Disagree" (7).

One question focused on **peer influence**, and referred to the extent to which their friends influence their decision about whether or not to engage in a specific risky driving behaviour when driving. Five **general perceived severity** questions related to the seriousness of consequences of risky driving in general, without referring to any specific risky driving behaviour. Four **general perceived susceptibility** questions related to participants' vulnerability to being caught or fined by police, incurring demerit points, and having a crash, in general, without referring to any specific risky driving behaviour. Three **specific perceived susceptibility** questions referred specifically to individual risky driving behaviours. Five **perceived costs** questions related to the costs associated with not performing a specific risky driving behaviour (or performing an alternative safety behaviour). A minimum of five **perceived benefits** questions related to the specific benefits associated with not performing a specific risky driving behaviour (or performing an alternative safety behaviour). All questions were developed for the present research program; therefore no parametric properties are available in the literature.

Table 3: Peer influence, general perceived severity, general perceived susceptibility, specific perceived susceptibility, perceived costs, and perceived benefits questions from the "speeding" questionnaire version.[2]

Peer influence question
My friends influence my decision about whether or not to speed.
General Perceived Severity questions
Having a car crash would result in serious injuries that would interfere with my life.
Losing my licence would interfere significantly with my social life / leisure activities.
Getting a fine would make it financially difficult for me to get through the month.
Losing my licence would interfere significantly with my work.

[2] Peer influence, specific perceived susceptibility, perceived costs, and perceived benefits questions were tailored to the other risky driving behaviours for each corresponding questionnaire version. Questions in this section were mixed-up for presentation in the questionnaire.

Being injured in a car crash would cause significant problems in my life.
General Perceived Susceptibility questions
My driving style makes it likely that I will be caught by the police.
My chances of having a car crash are very small.
My chances of being fined for my driving are high.
There is a good possibility that I will lose some points from my licence.
Specific Perceived Susceptibility questions
If I speed, it increases my chances of having a car crash.
If I speed, it increases my chances of being fined by the police.
If I speed, it increases my chances of losing some points from my licence.
Perceived Costs questions
Not speeding would mean that my friends might think I'm gutless.
Driving within the speed limit would make me feel frustrated because I can't keep up with traffic.
Driving within the speed limit would mean that I miss out on the excitement of speeding.
Not speeding involves the inconvenience of having to plan my travels in advance, in order to get to my destination on time.
Driving within the speed limit would mean that it takes longer to get to my destination.
Perceived Benefits questions
Driving within the speed limit would allow me to avoid disapproval from my parents.
Driving within the speed limit would mean that people don't think I'm a negligent or dangerous driver.
Sticking to the speed limit has the benefit of saving me money on petrol consumption.
Driving within the speed limit would make me feel secure and comfortable.
By not speeding, I avoid wear and tear on the engine of my car.

Section Three: Behavioural Intentions

Table 4 shows the behavioural intention questions included in each of the four questionnaire versions. Participants reported the frequency with which they would engage in a risky driving behaviour in the future. There were four questions for each behaviour (relating to four different

driving circumstances). Participants were instructed to give responses as a percentage of the times they are in each circumstance, by marking a straight vertical line anywhere on an unmarked, horizontal percentage scale. The scale was anchored with the verbal labels of "0% of such occasions", "50% of such occasions", and "100% of such occasions". All questions were developed for the present research program; therefore no parametric properties are available in the literature.

Table 4: Behavioural intention questions from each of the four questionnaire versions.

"Speeding" questionnaire version
How often would you drive at 66-75km/hr in a 60km/hr speed zone?
How often would you drive at more than 75km/hr in a 60km/hr speed limit zone?
How often would you drive at 106-115km/hr in a 100km/hr speed limit zone?
How often would you drive at more than 115km/hr in a 100km/hr speed limit zone?
"Drink-Driving" questionnaire version
When it would be desirable to drive, and you are under the influence of alcohol BUT NOT above the legal limit, how often would you drive?
When it would be desirable to drive, but you are above the legal limit for alcohol, how often would you drive?
When it would be desirable to drive, but you are above the legal limit for alcohol, AND you intend to drive only around local back streets, how often would you drive?
When it would be desirable to drive, but you are above the legal limit, AND you will be driving only when it is very late at night or very early in the morning, how often would you drive?
"Driving While Fatigued" questionnaire version
When it would be desirable to drive after sleeping less than 5 hrs, how often would you drive for 1 hr or more?
When it would be desirable to drive for 3 hrs, how often would you do that drive without a break?
When you are driving, and aware you feel fatigued, how often would you keep on driving?

When driving while fatigued, and there is nowhere to stop except the side of the road, how often would you keep on driving?
"Not Wearing Seat Belts" questionnaire version
If you are the DRIVER of the car, and are driving in HEAVY traffic, how often would you use the seat belt?
If you are the DRIVER of the car, and are driving in LITTLE traffic, how often would you use the seat belt?
If you are a PASSENGER in the car, and are driving in HEAVY traffic, how often would you use the seat belt?
If you are a PASSENGER in the car, and are driving in LITTLE traffic, how often would you use the seat belt?

Section Four: Authority-Rebellion

The original **Authoritarian-Rebellion Scale** (Kohn, 1972) contains 30 items that assess defiance to authority as a possible personality predictor of risky driving. Fifteen items state relatively extreme right-wing beliefs, and 15 items state relatively extreme left-wing beliefs (Robinson, Shaver & Wrightsman, 1991). Participants indicate their level of agreement by circling any one of six response options: "Disagree Strongly", "Disagree Somewhat", "Disagree Slightly", "Agree Slightly", "Agree Somewhat", and "Agree Strongly". The Authority-Rebellion scale has been found to have high split-half reliability (r = 0.81, 0.86, and 0.93) and adequate internal consistency for student samples (r = 0.84) (Kohn, 1972). Six right-wing, and six left-wing items were included for this study. These items were selected (original items 1, 2, 3, 6, 14, 15, 22, 23, 25, 27, 28, and 30) because they seemed easy to comprehend and most relevant to young people.

Section Five: Infringement and Crash History

Participants indicated how many times they had been fined for traffic infringements (other than parking fines), and how many crashes they had been involved in while driving, in the last two years. Those participants who indicated they had been fined also indicated how many times they had been fined for each of the four driving behaviours. Those participants who indicated they had been involved in a crash also indicated how many crashes they judged were caused by each of the four driving behaviours, except for not wearing a seat belt (e.g. Of these crashes, how

many would be a result of speeding?"). For all questions, appropriate skips were provided for those who had not been fined, or had not been involved in a crash.

Section Six: Social Desirability

A 13-item short form (Form C) of the **Marlowe-Crowne Social Desirability Scale** (Reynolds, 1982) was employed to assess socially desirable responding. Form C of the Marlowe-Crowne Social Desirability scale has acceptable reliability (r = 0.76), as well as strong correlation with the standard Marlowe-Crowne Social Desirability Scale and the Edwards Social Desirability Scale (r = 0.93 and 0.41 respectively). Participants indicated their level of agreement with each of the 13 items (e.g. "I sometimes feel resentful when I don't get my way"), by circling either "True" or "False".

Section Seven: Time Urgency

The full **Time Urgency Scale** (Landy, Rastegary, Thayer & Colvin, 1991) measures five constructs: General Hurry, Competitiveness, Task-Related Hurry, Eating Behaviour, and Speech Pattern (Conte, Landy & Mathieu, 1995). The items belonging to the last two of these factors were omitted from the present study because they seemed irrelevant to risky driving. The internal consistency of Competitiveness (r = 0.81), General Hurry (r = 0.81), and Task-Related Hurry (r = 0.72) were adequate (Landy et al., 1991). Thus, items from the Competitiveness (e.g. "Need to excel"), General Hurry (e.g. "Pressed for time") and Task-Related Hurry (e.g. "Work slowly") were included for this study. Participants rated how appropriate each of the 16 items was to themselves and situations in their lives on a 7-point scale, anchored at three points: "Never or Definitely Not" (1), "Neutral" (4), and "Always or Definitely" (7).

Section Eight: Sensation Seeking

The "Thrill and Adventure Seeking" (TAS) subscale from the 40-item **Sensation Seeking Scale**-Form V (SSS; Zuckerman, 1980) was included because of its relevance to risky driving. Internal consistency for the TAS subscale ranged from r = 0.77 to r = 0.82 (Zuckerman, 1994). Some word changes were made to the original TAS subscale in accordance with current social

convention[3]. Participants were presented with two choices (A and B) for each item, and were asked to indicate which statement best describes their likes or the way they feel (e.g. "A: I would to try surfing / B: I would not like to try surfing"). If they did not like either statement, participants were instructed to choose the statement that they least dislike.

Section Nine: Driver Anger

An extract of the **Driving Anger Scale** (DAS; Deffenbacher et al., 1994) was also employed. Participants are given a range of driving situations (e.g. "Someone is weaving in and out of traffic"), and are asked to imagine that each situation is actually happening to them, before rating the amount of anger that they would feel. Responses are made by circling any one of five response options: "Not At All", "A Little", "Some", "Much", and "Very Much". Factor analysis of the original DAS (Deffenbacher et al., 1994) resulted in six reliable factors that were characterized as: hostile gestures, traffic obstructions, police presence, slow driving, discourtesy, and illegal driving. In order to gain a shortened index of driver anger for the present study, we selected one item from each of the six subscales. Each of the six items showed significant item-to-total-scale score correlations (r=0.52, 0.50, 0.50, 0.47, 0.47, 0.28) (Deffenbacher et al., 1994). Although the item-to-total-scale score correlation for item 6 ("Someone is weaving in and out of traffic") was low (r=0.28), it was higher than the correlations for the other three items in the same 'illegal driving' scale (r=0.12, 0.17, 0.23).

Section Ten: Specific Perceived Severity

Table 5 shows the specific perceived severity questions included in the "speeding" questionnaire version. **Specific perceived severity** questions related to the seriousness of consequences of one of the four driving behaviours. Participants rated the severity of three different consequences (being fined, incurring demerit points, and sustaining injuries) for each behaviour, in terms of the impact each circumstance would have on their lives. Responses were made on a 7-point scale, anchored with three verbal labels of "Extremely severe" (1), "Average severity" (4), and "Not severe at all" (7). All questions were developed for the present research program; therefore no parametric properties are available in the literature.

[3] Q.17 (change "surfboard riding" to "surfing"), Q.23 (change "parachute jumping" to "skydiving"), and Q.38 (change "foolhardy" to "foolish") (with question numbers reflecting the original order in

Table 5: Specific perceived severity questions from the "speeding" questionnaire version.[4]

How severe are the consequences of SPEEDING, in terms of the FINES you would receive?
How severe are the consequences of SPEEDING, in terms of the POINTS you would lose?
How severe are the consequences of SPEEDING, in terms of the INJURIES you would receive?

Section Eleven: Demographics

Each survey version assessed personal characteristics (in order): gender, age, main language spoken at home, postcode, drivers license status (response options were: Learners, Red P-plates, Green P-plates, Ordinary, Silver, and Gold), and driving experience (in years and months). Participants only completed this section once for each two-questionnaire survey.

Procedure

Ethics approval was granted by the University of Sydney Ethics Committee, and ratified by the University of NSW Ethics Committee. Participants were recruited as described in the "Participants and sampling" section. Participants were seated in a room at the University of NSW as a group in order to enhance feelings of anonymity. Participants who confirmed that they were between 16 and 25 years old and held a current NSW drivers license were asked to complete a short questionnaire individually. Participants were assured that their involvement was entirely voluntary, that they could withdraw at any time, and that their responses would be confidential. In accordance with the 'Bogus Pipeline' technique, all participants were told that researchers wished to check driving records as part of the study, and were asked to provide their Drivers' License number. All participants read the Participant Information Sheet, and were instructed to read all questions carefully and to answer each question as honestly as possible.

the SSS-Form V).

[4] Specific perceived severity questions were tailored to the other risky driving behaviours for each corresponding questionnaire version. Questions in this section were mixed-up for presentation in the questionnaire.

Participants were given 30 minutes to complete the questionnaire. Researchers checked returned questionnaires immediately to ensure that all sections had been completed. Participants were encouraged to complete any remaining sections. All participants were debriefed and thanked for their participation.

Statistical Analyses

Data were analysed employing SPSS. A Type 1 error rate of 0.05 was employed for all analyses, and all tests were 2-tailed.

Item Analysis

Response distributions were examined for all belief items (that is, items comprising the four HBM subscales, and peer influence scale) to check for irrelevant items. Specifically, if respondents perceived a statement as being untrue or irrelevant to their driving, respondents may circle *either* "Neutral" *or* "Strongly disagree". Consequently, a high proportion of both of these response options, together with low proportions for the other response options, may indicate an irrelevant belief. Such items were omitted from all further statistical analyses.

Scale Construction

First, all reverse-worded items were reverse-scored. Factor analyses were then employed to verify the construction of all scales modified or developed for this research. Original instructions for the scoring of the Authority-Rebellion, Time Urgency, and Sensation Seeking personality scales, as well as the Marlowe-Crowne Social Desirability scale, were followed. For each of the scales verified by factor analysis, internal consistency was assessed employing Cronbach's Alpha, except for the illusory invulnerability scales which contained only two items, and so the correlation between these items was calculated (instead of Cronbach's Alpha).

Internal consistency was expected to be high for scales assessing one underlying construct (i.e. road-related specific illusory invulnerability and behavioural intention scales). However, some scales were designed to assess levels of a particular dependent variable, without assuming that the dependent variable reflects only one underlying construct (i.e. road-unrelated illusory invulnerability, road-related general illusory invulnerability, perceived severity, perceived susceptibility, perceived benefits, and perceived costs scales). For example, in relation to the **specific perceived severity of speeding**, someone who has financial difficulties may be more likely to believe that a fine for speeding is extremely severe, while believing the incurring of demerit points is only moderately severe. People may perceive the severity of speeding differently in terms of incurring demerit points, being fined by the police, or having a car crash; but the sum of severities of these outcomes gives a good indication of overall severity. A low Cronbach's Alpha may be observed because these items may not be measuring one underlying construct. Nonetheless, the sum of scores may remain a valuable overall index of **specific perceived severity of speeding**.

Descriptive Statistics

Mean and standard deviation were computed for all scales constructed, in order to check that there was sufficient variation for regression analyses. For all behaviours, higher scores reflected lower endorsement of illusory invulnerability, HBM beliefs, peer influence and authority rebellion, and greater endorsement of time urgency, sensation seeking and driver anger.

Correlations between Social Desirability Scores and All Factors Examined

In order to check the influence of socially desirable responding as a contaminant of self-report data, scores from the **Marlowe-Crowne Social Desirability Scale** were correlated with all self-report measures included in the present research (all personality scales, beliefs, and behaviour scales). If social desirability scores *do not* correlate with self-report variables then there is less cause for concern regarding response bias due to social desirability.

Multiple Linear Regression Analyses

The primary analytic model employed was Multiple Linear Regression. Regression models for each of the four driving behaviours (each containing a range of possible factors) were compared. The advantage of multiple linear regression is that the multiple correlation co-efficient, R, is widely understood, and the square of this coefficient provides the proportion of variance in the dependent variable that is accounted for by the combined set of "predictors". Furthermore, when examining a range of predictive factors, hierarchical regression analysis may be undertaken. Hierarchical regression analysis allows the researcher to examine an entire range of factors that may influence risky driving behaviour, and assess the predictive strength of an individual predictor (or set of predictors) before investigating the predictive strength of other predictors. Hierarchical regression analysis allows an experimenter to run analyses based on their experimental rationale, rather than by simply interrogating the data without any *a priori* basis. This methodology is particularly advantageous for road safety research, where many factors have been suggested to impact upon risky driving and/or the occurrence of car crashes.

In addition, the test of an individual ß-coefficient of a predictor *that is added to a model* tests whether that predictor accounts for a significant amount of additional variation. If the additional predictor is highly correlated with the other predictors that are already in the model, the variation it would normally explain in the dependent variable will be taken up by its *covariance* with these other related predictors. However, there may be some added variation, which is *not* explained by this covariance, but by the individual variation of that added predictor. A significant p-value indicates that the added predictor(s) are, in fact, adding to the amount of variance accounted for by the original model, and that there is significant variation explained by this/these added predictor(s) (and that was not explained by the original model).

A hierarchical regression model was employed for the present research. A gradation of factors was proposed, arranged in order of *how stable each set of factors were as an intrinsic characteristic of the person*. Accordingly, three regression models were considered for each behaviour:

(1) 'Demographics only' Model

Age and Gender were considered to be the *most* stable characteristics of a person, as they are fixed attributes of an individual. These factors were forced to enter first in the regression analyses.

(2) 'Demographics plus personality factors' Model

Personality factors are defined as stable and consistent characteristics of an individual (Weiten, 2001). While personality factors are not fixed individual features (unlike age and gender) they were considered the next most stable factors, and were consequently considered after any effects of demographics.

(3) 'Demographics plus personality factors plus beliefs' Model

Attitudes and beliefs were hypothesised to be the least stable factors of an individual, as the attitudes and beliefs people hold may vary at any time. These factors were to be considered after the effects of demographic and personality factors.

Hierarchical regression analysis has been previously employed in relation to road safety research (Fernandes & Job, 2003; Dahlen et al., 2005; Norris, Matthews & Riad, 2000; Mesken, Lajunen & Summala, 2002; Fernandes et al., 2004). For example, Norris et al. (2000) examined the effects of a number of demographic, personality (referred to by the authors as 'characterological'), and situational factors on the occurrence of car crashes. The results showed that the predictive effects of some risk factors were at least partially mediated by other factors, when all factors were examined together in the regression model. For instance, while gender was shown to be a significant predictor of car crashes in the initial demographics logistic regression model, when all demographic, personality and situational factors were included in the final step of the hierarchical regression model, the gender effect was found to be non-significant – suggesting that the heightened risk of a car crash for males was at least partly attributable to their greater tendency to disregard speed limits and traffic regulations (Norris et al., 2000).

Results

Statistical Analyses

Item Analysis

For each of the four driving behaviours, no items exhibited an unreasonably high proportion of responses (greater than 20%) for either the "Neutral" or "Strongly disagree" response options. However, for specific perceived susceptibility for not wearing seat belts, one item was omitted prior to analyses because it was thought to be illogical (Question 10, Section 2; "If I don't wear a seat belt while driving, it increases my chances of having a crash"). All other items were retained for further statistical analyses.

Scale construction

Illusory Invulnerability scales

Three illusory invulnerability scales were constructed for each behaviour – **road-unrelated illusory invulnerability, road-related general illusory invulnerability, and road-related specific illusory invulnerability** – with each scale comprising of two items. A factor analysis with all six illusory invulnerability items was undertaken for each behaviour. As expected, factor analysis revealed a three-factor structure for drink-driving; however, a two-factor structure was found for speeding, not wearing seat belts and driving while fatigued. Table 6 shows the item correlations for all illusory invulnerability scales constructed for each of the four behaviours in Study 1. Item correlations were satisfactory for all road-related general illusory invulnerability and road-related specific illusory invulnerability scales, but low (and not statistically significant) for all road-unrelated illusory invulnerability scales.

Table 6: Item correlations for all road-related specific, road-related general, and road-unrelated illusory invulnerability scales in Study 1, for each questionnaire version. [5]

	"Speeding"	**"Drink-**	**"Driving While**	**"Not Wearing**

[5] Road-unrelated and road-related general illusory invulnerability questions were the same for all behaviours. Different correlation values reflect the fact that half of the participants completed the "Drink-driving" and "Speeding" versions of the questionnaire, while the other half completed the "Driving while fatigued" and "Not wearing set belts" versions.

	version	driving" version	Fatigued" version	Seat belts" version
α (road-related specific)	0.69**	0.40**	0.72**	0.69**
α (road-related general)	0.48**	0.48**	0.59**	0.59**
α (road-unrelated)	0.13	0.13	0.12	0.12

** Correlation is significant at the 0.001 level (2-tailed).

Perceived Severity scales

For each behaviour, **specific perceived severity** scales comprised three items, while the **general perceived severity** contained five items. For specific perceived severity scales, for all four behaviours, factor analyses revealed that the relevant items assessed one factor. For general perceived severity scales, for all four behaviours, factor analyses revealed a two-factor structure. Table 7 shows Cronbach's Alpha for all perceived severity scales constructed for each of the four behaviours in Study 1. Reliability levels were acceptable for all perceived severity scales constructed.

Table 7: Cronbach's Alpha reliability levels for all general perceived severity and general specific severity scales in Study 1, for each questionnaire version. [6]

	"Speeding" version	"Drink-driving" version	"Driving While Fatigued" version	"Not Wearing Seat belts" version
α (general severity)	0.57	0.57	0.62	0.62
α (specific severity)	0.70	0.80	0.77	0.80

Perceived Susceptibility scales

For each behaviour, **specific perceived susceptibility** and **general perceived susceptibility** scales comprised four items each. However, for not wearing seat belts, one item was omitted prior to analyses because it was thought to be illogical (Question 10, Section 2; "If I don't wear a

[6] General perceived severity questions were the same for all behaviours. Different Cronbach's Alpha values reflect the fact that half of the participants completed the "Drink-driving" and

seat belt while driving, it increases my chances of having a crash"). For both general perceived susceptibility and specific perceived susceptibility scales, for each of the four behaviours, factor analyses revealed that the relevant items assessed one factor. Table 8 shows Cronbach's Alpha for all perceived susceptibility scales constructed for each of the four behaviours in Study 1. Reliability levels were acceptable for all perceived susceptibility scales constructed.

Table 8: Cronbach's Alpha for all general perceived susceptibility and general specific susceptibility scales in Study 1, for each questionnaire version. [7]

	"Speeding" version	**"Drink-driving" version**	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**
α (general susceptibility)	0.74	0.74	0.84	0.84
α (specific susceptibility)	0.60	0.64	0.56	0.69

Perceived Benefits scales

The perceived benefits scale comprised eight items for driving while fatigued, and five items each for speeding, not wearing seat belts, and drink-driving behaviours. Factor analyses revealed a two-factor structure for each of the four behaviours. Cronbach's Alpha reliability levels were high for driving while fatigued and speeding behaviours (α=0.73 and 0.71 respectively), but were low for not wearing seat belts and drink-driving behaviours (α=0.42 and 0.30 respectively). Questions related to a range of distinct benefits, so it is reasonable to discover that these items assess more than one factor, and may still form valid perceived benefits scales.

Perceived Costs scales

The perceived costs scales comprised of four items for each of the four behaviours. Factor analyses revealed either a one-factor structure (for not wearing seat belts) or two-factor structure (for driving while fatigued, speeding and drink-driving). Cronbach's Alpha reliability levels

"Speeding" versions of the questionnaire, while the other half completed the "Driving while fatigued" and "Not wearing set belts" versions.

[7] General perceived susceptibility questions were the same for all behaviours. Different Cronbach's Alpha values reflect the fact that half of the participants completed the "Drink-driving" and "Speeding" versions of the questionnaire, while the other half completed the "Driving while fatigued" and "Not wearing set belts" versions.

were acceptable for driving while fatigued, not wearing seat belts and speeding behaviours (α=0.50, 0.79 and 0.63 respectively), but were low for drink-driving (α=0.41). Questions related to a range of distinct costs, so it is reasonable to discover that these items assess more than one factor, while they may still form valid perceived costs scales.

Behavioural intentions scales

The behavioural intention scales comprised of four items for each of the four behaviours. Factor analyses revealed either a one-factor structure (for not wearing seat belts, speeding and drink-driving) or two-factor structure (for driving while fatigued). Cronbach's Alpha reliability levels were satisfactory for all behaviours (α=0.87, 0.84, 0.78, and 0.66).

Personality scales

For driver anger, Cronbach's Alpha reliability levels were acceptable for speeding, drink-driving, not wearing seat belts, and driving while fatigued (α=0.68, 0.68, 0.69, and 0.69, respectively).

Descriptive Statistics

Tables 9-12 show the mean and standard deviation for all scales constructed in Study 1 for each of the four risky driving behaviours. For all behaviours, higher scores reflected lower endorsement of illusory invulnerability, HBM beliefs, peer influence and authority rebellion, and greater endorsement of time urgency, sensation seeking and driver anger. Higher peer influence endorsements were found for driving while fatigued and speeding, while higher specific perceived susceptibility was observed for drink-driving and speeding.

Table 9: Mean and standard deviation for all predictors of speeding in Study 1.

Predictor	**Mean**	**Standard Deviation**
Authority-rebellion personality scale	47.0	7.14
Time urgency personality scale	70.6	9.92
Sensation seeking personality scale	6.3	2.72
Driver anger personality scale	19.7	3.83
Road-unrelated illusory invulnerability	5.1	1.16
Road-related general illusory invulnerability	5.3	1.63

Road-related specific illusory invulnerability	5.5	1.99
Specific perceived severity	9.0	3.43
General perceived severity	15.3	5.24
General perceived susceptibility	18.1	4.48
Specific perceived susceptibility	5.1	2.14
Perceived benefits	14.6	4.30
Perceived costs	22.9	5.36
Peer influence	5.6	1.49

Table 10: Mean and standard deviation for all predictors of drink-driving in Study 1.

Predictor	**Mean**	**Standard Deviation**
Authority-rebellion personality scale	47.0	7.14
Time urgency personality scale	70.6	9.92
Sensation seeking personality scale	6.3	2.72
Driver anger personality scale	19.7	3.83
Road-unrelated illusory invulnerability	5.1	1.16
Road-related general illusory invulnerability	5.3	1.63
Road-related specific illusory invulnerability	3.3	1.64
Specific perceived severity	8.0	3.98
General perceived severity	15.3	5.24
General perceived susceptibility	18.1	4.48
Specific perceived susceptibility	5.1	2.46
Perceived benefits	11.0	3.27
Perceived costs	26.9	4.48
Peer influence	6.0	1.52

Table 11: Mean and standard deviation for all predictors of driving while fatigued in Study 1.

Predictor	**Mean**	**Standard Deviation**
Authority-rebellion personality scale	48.8	6.65
Time urgency personality scale	67.9	8.53

Sensation seeking personality scale	6.2	2.62
Driver anger personality scale	19.4	3.99
Road-unrelated illusory invulnerability	4.9	1.33
Road-related general illusory invulnerability	4.9	1.80
Road-related specific illusory invulnerability	4.7	2.03
Specific perceived severity	9.1	3.95
General perceived severity	16.2	5.60
General perceived susceptibility	19.1	5.10
Specific perceived susceptibility	8.1	2.88
Perceived benefits	21.2	6.80
Perceived costs	25.1	4.19
Peer influence	5.1	1.82

Table 12: Mean and standard deviation for all predictors of not wearing seat belts in Study 1.

Predictor	**Mean**	**Standard Deviation**
Authority-rebellion personality scale	48.8	6.6
Time urgency personality scale	67.9	8.53
Sensation seeking personality scale	6.2	2.62
Driver anger personality scale	19.4	3.99
Road-unrelated illusory invulnerability	4.9	1.33
Road-related general illusory invulnerability	4.9	1.80
Road-related specific illusory invulnerability	3.9	2.27
Specific perceived severity	8.3	4.14
General perceived severity	16.2	5.60
General perceived susceptibility	19.1	5.10
Specific perceived susceptibility	8.3	3.25
Perceived benefits	14.4	4.37
Perceived costs	30.2	5.33
Peer influence	6.4	1.32

Correlations between Social Desirability Scores and All Factors Examined

Table 13 shows statistical significance levels for Pearson correlations between Marlowe-Crowne social desirability scores and all demographic, personality, attitudinal, and behaviour factors for Study 1. Social desirability scores did not correlate significantly with any factors for not wearing seat belt or drink-driving behaviours, but correlated significantly with behavioural intentions for both driving while fatigued (r=-0.20; p=0.045) and speeding (r=-0.20; p=0.043). Nevertheless, given that social desirability correlated with only two scales, it appears most likely that these correlations reflect a Type I error. Consequently, social desirability will not be included as a covariate in subsequent regression analyses for Study 1.

Table 13: Statistical significance levels for Pearson correlations between social desirability and all demographic, personality, attitudinal, and behaviour factors in Study 1, for each of the four risky driving behaviours.

FACTOR	**Speeding**	**Drink-driving**	**Driving While Fatigued**	**Not Wearing Seat Belts**
Gender	.616	.616	.273	.273
Age	.944	.944	.180	.180
Authority-Rebellion	.101	.101	.997	.997
Time Urgency	.132	.132	.759	.759
Sensation Seeking	.205	.205	.612	.612
Driver Anger	.280	.280	.096	.096
Behavioural Intentions	.043*	.678	.045*	.186
Specific Severity	.674	.997	.987	.797
General Severity	.136	.155	.579	.496
Road-Related General Illusory Invulnerability	.613	.674	.797	.751
Road-Unrelated General Illusory Invulnerability	.155	.136	.496	.529

Road-Related Specific Illusory Invulnerability	.839	.606	.937	.579
General Susceptibility	.075	.075	.057	.057
Specific Susceptibility	.574	.714	.915	.396
Benefits	.326	.362		.578
Costs	.290		.474	.619
Peer influence	.264		.421	.245

* Correlation is significant at the 0.05 level (2-tailed).

Regression Analyses

'Speeding' behaviour model

The three-step hierarchical regression analysis for the prediction of speeding behaviour is summarised in Table 14. For speeding behaviour, the overall proportion of variance accounted for by the final regression model was 62.3% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for speeding, age and gender did not predict the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, sensation seeking and driver anger predicted speeding behaviour. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, these two factors continued to predict speeding, while gender also emerged as a significant predictor, along with road-unrelated illusory invulnerability, general perceived susceptibility, and specific perceived susceptibility. When all factors had been accounted for in the final hierarchical regression model, speeding behaviour was significantly predicted by **gender**, **sensation seeking**, **driver anger**, **road-unrelated illusory invulnerability**, **general perceived susceptibility**, **specific perceived susceptibility**.

Table 14: Summary of Study 1 regression analyses results for speeding behaviour, illustrating the factors predicting the behaviour within each of the three hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**

Model 1: Demographics only			
Gender	-7.565	-.411	.682
Age	-.822	-.120	.905
Model 2: Demographics plus personality factors			
Gender	21.894	1.330	.187
Age	-.159	-.027	.978
Authority-Rebellion	-2.040	-1.885	.062
Time Urgency	-.801	-.973	.333
Sensation Seeking	9.475	3.221	.002**
Driver Anger	14.117	7.014	<.001**
Model 3: Demographics plus personality factors plus attitudes			
Gender	45.681	3.077	.003**
Age	4.490	.953	.343
Authority-Rebellion	-.891	-.999	.320
Time Urgency	-.166	-.227	.821
Sensation Seeking	6.257	2.598	.011*
Driver Anger	9.095	4.925	<.001**
Road-Unrelated Illusory Invulnerability	-24.238	-4.185	<.001**
Road-Related General Illusory Invulnerability	-2.644	-.504	.616
Road-Related Specific Illusory Invulnerability	-2.764	-.623	.535
General Perceived Severity	.310	.231	.818
Specific Perceived Severity	-.460	-.256	.799
General Perceived Susceptibility	-13.025	-5.936	<.001**
Specific Perceived Susceptibility	12.768	4.430	<.001**
Perceived Benefits	.325	.214	.831
Perceived Costs	-.146	-.100	.920
Peer influence	.877	.201	.841

** Significant at the 0.001 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

‘Drink-Driving’ behaviour model

The three-step hierarchical regression analysis for the prediction of drink-driving behaviour is summarised in Table 15. For drink-driving behaviour, the overall proportion of variance accounted for by the final regression model was 23.3% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for drink-driving, age and gender did not predict the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, driver anger predicted drink-driving behaviour. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, driver anger no longer predicted drink-driving behaviour. When all factors had been accounted for in the final hierarchical regression model, only **peer influence** significantly predicted drink-driving.

Table 15: Summary of Study 1 regression analyses results for drink-driving behaviour, illustrating the factors predicting the behaviour within each of the three hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**
Model 1: Demographics only			
Gender	-23.733	-1.715	.089
Age	-3.767	-.735	.464
Model 2: Demographics plus personality factors			
Gender	-21.653	-1.436	.154
Age	-3.674	-.683	.496
Authority-Rebellion	.696	.704	.483
Time Urgency	-.147	-.193	.848
Sensation Seeking	2.230	.822	.413
Driver Anger	4.047	2.195	.031*
Model 3: Demographics plus personality factors plus attitudes			
Gender	-11.281	-.695	.489
Age	-.650	-.130	.897
Authority-Rebellion	1.025	1.039	.302
Time Urgency	.501	.606	.546
Sensation Seeking	.730	.286	.775

Driver Anger	3.478	1.852	.067
Road-Unrelated Illusory Invulnerability	-.432	-.069	.945
Road-Related General Illusory Invulnerability	-11.114	-1.956	.054
Road-Related Specific Illusory Invulnerability	6.342	1.631	.107
General Perceived Severity	-.123	-.083	.934
Specific Perceived Severity	3.168	1.657	.101
General Perceived Susceptibility	-4.046	-1.911	.059
Specific Perceived Susceptibility	1.275	.462	.646
Perceived Benefits	-.760	-.340	.734
Perceived Costs	-2.028	-1.323	.189
Peer influence	-17.153	-3.846	<.001**

** Significant at the 0.001 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

'Driving While Fatigued' behaviour model

The three-step hierarchical regression analysis for the prediction of driving while fatigued behaviour is summarised in Table 16. For driving while fatigued behaviour, the overall proportion of variance accounted for by the final regression model was 34.7% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for driving while fatigued, gender significantly predicted the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, gender continued to predict drink-driving, while no personality factors significantly predicted the behaviour. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, gender no longer significantly predicted driving while fatigued behaviour, while specific perceived susceptibility, perceived benefits of not driving while fatigued, and perceived costs of not driving while fatigued emerged as significant predictors of the behaviour. When all factors had been accounted for in the final hierarchical regression model, driving while fatigued behaviour was significantly predicted by **specific perceived susceptibility**, **perceived benefits of not driving while fatigued**, and **perceived costs of not driving while fatigued**.

Table 16: Summary of Study 1 regression analyses results for driving while fatigued behaviour, illustrating the factors predicting the behaviour within each of the three hierarchical models.

PREDICTOR	β-coefficient	t-value	p-value
Model 1: Demographics only			
Gender	-37.345	-2.548	.012*
Age	3.138	.552	.582
Model 2: Demographics plus personality factors			
Gender	-31.667	-2.162	.033*
Age	1.500	.260	.795
Authority-Rebellion	.054	.049	.961
Time Urgency	1.393	1.675	.097
Sensation Seeking	2.785	1.020	.310
Driver Anger	3.534	1.905	.060
Model 3: Demographics plus personality factors plus attitudes			
Gender	8.363	.546	.586
Age	5.838	1.167	.246
Authority-Rebellion	1.218	1.220	.226
Time Urgency	1.496	1.988	.050
Sensation Seeking	3.300	1.353	.180
Driver Anger	1.440	.794	.429
Road-Unrelated Illusory Invulnerability	-1.385	-.255	.799
Road-Related General Illusory Invulnerability	1.926	.395	.694
Road-Related Specific Illusory Invulnerability	3.372	.930	.355
General Perceived Severity	-.586	-.417	.678
Specific Perceived Severity	2.722	1.486	.141
General Perceived Susceptibility	-2.951	-1.475	.144
Specific Perceived Susceptibility	11.414	3.705	<.001**
Perceived Benefits	-3.823	-2.895	.005**
Perceived Costs	-4.756	-2.726	.008**
Peer influence	-5.371	-1.345	.182

** Significant at the 0.001 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

'Not Wearing Seat Belts' behaviour model

The three-step hierarchical regression analysis for the prediction of not wearing seat belt behaviour is summarised in Table 17. For not wearing seat belt behaviour, the overall proportion of variance accounted for by the final regression model was 9.6% (based on "Adjusted R Square" values), and the regression model was not statistically significant. In the *'Demographics only' Model* for not wearing seat belts, age and gender did not predict the behaviour. Similarly, when personality factors were added in the *'Demographics plus personality factors' Model*, no factor significantly predicted not wearing a seat belt. However, when all factors had been accounted for in the *'Demographics plus personality factors plus attitudes' Model*, not wearing a seat belt was significantly predicted by **general perceived susceptibility**.

Table 17: Summary of Study 1 regression analyses results for not wearing seat belt behaviour, illustrating the factors predicting the behaviour within each of the three hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**
Model 1: Demographics only			
Gender	-.975	-.181	.857
Age	-.052	-.025	.980
Model 2: Demographics plus personality factors			
Gender	-2.044	-.375	.709
Age	.873	.404	.687
Authority-Rebellion	.262	.656	.513
Time Urgency	.071	.227	.821
Sensation Seeking	-.815	-.795	.429
Driver Anger	-1.323	-1.924	.057
Model 3: Demographics plus personality factors plus attitudes			
Gender	-7.020	-1.097	.276
Age	.037	.017	.986

Authority-Rebellion	-.162	-.387	.699
Time Urgency	.247	.784	.435
Sensation Seeking	-.817	-.796	.428
Driver Anger	-.145	-.192	.848
Road-Unrelated Illusory Invulnerability	.451	.211	.833
Road-Related General Illusory Invulnerability	1.530	.751	.455
Road-Related Specific Illusory Invulnerability	-.643	-.478	.634
General Perceived Severity	.603	1.080	.283
Specific Perceived Severity	1.338	1.934	.056
General Perceived Susceptibility	1.743	2.095	.039*
Specific Perceived Susceptibility	.107	.119	.906
Perceived Benefits	-.793	-1.118	.266
Perceived Costs	.520	.664	.509
Peer influence	2.258	.711	.479

* Significant at the 0.05 level (2-tailed).

Discussion

Study 1 tested the apparent assumption that demographic, personality, and attitudinal factors contribute to risky driving behaviours in the same way, regardless of the behaviour. Results clearly illustrate that different predictors are relevant to individual risky driving behaviours, supporting previous findings by the present researchers (Fernandes & Job, 2003; Fernandes et al., 2004). Specific attitudes and beliefs associated with different dimensions of the HBM appear to be the strongest predictors of risky driving behaviour. In addition to predictors from the HBM, peer influence was also an important factor (particularly for drink-driving).

Predictors of the four risky driving behaviours

In the present study, **speeding** behaviour was significantly predicted by gender, sensation seeking, driver anger, road-unrelated illusory invulnerability, general perceived susceptibility,

and specific perceived susceptibility. Thus, lower perceived likelihood of having a crash, being fined, or incurring demerit points (both in general and specifically for speeding) was associated with more frequent speeding behaviour. Furthermore, lower perceived likelihood that negative events (unrelated to driving) will happen to them (compared peers of the same age and gender) was associated with more frequent speeding behaviour. Driver anger as a personality predictor of speeding suggests that higher anger elicited specifically from driving situations was associated with more frequent speeding behaviour. Sensation seeking as a significant predictor of speeding is consistent with previous research that has long proposed sensation seeking as a key contributor to risky driving behaviour (Zuckerman, 1994; Dahlen et al., 2005; Horvath & Zuckerman, 1993).

Gender was a significant predictor of speeding, supporting research illustrating gender as an influential factor for speeding behaviour (Job, 1999; Roads and Traffic Authority of NSW, 2005; Jonah, 1990). Interestingly, though, gender failed to significantly predict seat belt wearing and drink-driving, and was only an initial predictor of driving while fatigued (but did not predict the behaviour upon the addition of personality and belief factors) – despite research suggesting that gender also influences these risky driving behaviours (Fell & Black, 1997; Horne & Reyner, 1995; Corfitsen, 1994; Prabhakar et al., 1996). Clearly, further research is needed to clarify this finding.

Peer influence was the only significant predictor of **drink-driving** behaviour, when all factors had been included in the regression model. The association between peer influence and intention to drink-drive suggests that greater peer influence is associated with more frequent drink-driving behaviour. Drink-driving was the only risky driving behaviour to be predicted by peer influence. The strength of peer influence as an important factor associated with drink-driving may be due to recent road safety advertisement campaigns that have focused on social norms in relation to drink-driving behaviour (e.g. “If you drink and drive, you’re a bloody idiot” campaign). Further, the efficacy of random breath testing throughout NSW is thought to be based partly on a shift in social norms (Job et al., 1997). This also supports prior research indicating the importance of social norms to drink-driving (Gulliver & Begg, 2004), given that many circumstances in which young drivers might drink-drive involve social drinking situations when they are with their friends.

Specific perceived susceptibility was a significant predictor of **driving while fatigued** behaviour. This suggests that lower perceived likelihood of having a crash, being fined, or incurring demerit points *specifically for driving while fatigued* was associated with more frequent driving while fatigued behaviour. In addition, the perceived costs and perceived benefits associated with *not* driving while fatigued were significant predictors of the behaviour. This suggests that lower endorsement of the benefits of taking a break while driving to avoid the effects of fatigue (such as being refreshed for the upcoming drive), as well as higher endorsement of the costs (such as taking longer to get to a destination) was associated with more frequent driving while fatigued behaviour. Many of the costs and benefits associated with driving while fatigued focus on the extent of on-road travelling time experienced by the driver, which appears particularly relevant to driving while fatigued.

General perceived susceptibility was the only significant predictor of **not wearing seat belt** behaviour. This suggests that lower perceived likelihood of having a crash, being fined, or incurring demerit points *in general* was associated with less frequent seat belt use. This appears appropriate for seat belt wearing, given the recent emphasis in road safety media campaigns that have utilized fear of fines and demerit points as a deterrent to driving without wearing a seat belt.

Comments on individual predictors

With regard to individual predictors, Study 1 findings are theoretically interesting. While road-unrelated illusory invulnerability was shown to be a significant predictor of speeding, no other illusory invulnerability scale significantly predicted any other risky driving behaviour in this study. Thus, despite literature illustrating a relationship between risky driving and illusory invulnerability (e.g. Lee et al., 1993; Job, 1990a; 1990b; 1999), the importance of illusory invulnerability as a determinant of risky driving may be over-emphasised.

While personality factors significantly predicted two (of the four) driving behaviours, a specific belief factor was a stronger predictor of the behaviour in each case. Indeed, after controlling for

the effects of age, gender, and personality factors, specific beliefs remained the strongest predictors of all four risky driving behaviours.

Practical implications

Chiefly, Study 1 results suggest that we should not simply extrapolate significant predictors of one behaviour to another. (These issues will be elaborated in the General Discussion). Thus, interventions for a particular risky driving behaviour should be targeted for that behaviour. The present research provides an insight into which factors may be relevant for speeding, drink-driving, driving while fatigued, and not wearing seat belts. However, only speeding and drink-driving were strong models; thus, other factors may need to be considered for driving while fatigued and not wearing seat belts. Results from the age range examined in the present study illustrate that there is no effect of age on risky driving. Thus, when targeting interventions for drivers in this age range, there is no need to consider finer segmentation of age. Further, given that personality factors are defined as stable and consistent characteristics of an individual (Weiten, 2001), driver beliefs may be more amenable to change than personality factors.

CHAPTER FOUR

STUDY 2: EXPLORATION OF THE GENERALIZABILITY OF STUDY 1 RESULTS TO THE GENERAL POPULATION, AND COMPARISON OF URBAN AND RURAL DATA

The issue of generalizability is often identified as a concern in research using a first-year psychology student sample. In some cases (e.g. research on basic mental processes), generalization could be expected with reasonable confidence. However, our previous research on risky driving (Fernandes & Job, 2003) suggests that results may not generalize from university students to the general population.

Analysis of the location of Study 1 participants' residence in Sydney showed that 23.4% of participants lived in the lower eastern beaches and eastern suburbs, 20.1% of participants lived in the southern beaches and inner southern suburbs, 14.5% of participants lived in the inner western suburbs, and 12.8% of participants lived in the northern beaches and north shore suburbs. With a total of 70.8% of participants living in these regions, suburbs in the greater western and south-western regions of Sydney were substantially under-represented in the student sample. Furthermore, socioeconomic status may vary more in the general community than in a sample of university students, given that acceptance into university is conditional upon completion of the Higher School Certificate. Consequently, to assume generalization to the general population would be foolhardy.

The purpose of Study 2 was to investigate whether the results from Study 1 generalize in a metropolitan Sydney sample. If similar predictors are found for a particular risky driving behaviour in both the student population and general population samples, then the results may be employed with greater confidence to guide research, policy and practice.

Study 2 also aimed to compare data from the metropolitan Sydney sample with data from a rural NSW sample. Research has illustrated that road crash fatality and injury severity levels may vary

significantly between rural and urban locations (Khorashadi, Niemeier, Shankar & Mannering, 2005; Clark & Cushing, 2004; Lin, Huang, Hwang, Wu & Yen, 2004). The reasons for such differences may relate partly to differences in the demands placed on drivers in rural and urban environments. For example, due to potentially driving greater distances in rural areas (resulting in greater traveling time), driver fatigue may be significantly higher in rural areas, compared to urban areas. This, together with different driver populations, roadway design characteristics and traffic conditions (Khorashadi et al., 2005), may all potentially contribute to a difference in risky driving behaviour between rural and urban areas.

Khorashadi et al. (2005) note the lack of research specifically investigating the difference between rural and urban risk factors and resultant risky driving behaviour. Dunsire & Baldwin (1999) compared urban and rural drink-driving behaviour in a sample of young Western Australian drivers, with results indicating significantly higher self-reported drink-driving for urban youths.

Study 2 was conducted at various RTA Motor Registries around metropolitan Sydney and rural NSW. People entering were asked to complete the questionnaire while they wait for service inside the registry. This methodology has the advantages of efficiently sampling a wider sector of the driving public, and a high and apparently unbiased response rate. In order to minimize refusal rate, the questionnaire package was kept brief. Each individual behaviour was packaged as one questionnaire version, resulting in four questionnaire versions for Study 2, each with a completion time of approximately ten minutes.

Study 2 examined a range of demographic factors, personality factors, attitudes and beliefs in the prediction of speeding, drink-driving, driving while fatigued, and not wearing seat belts, for young drivers aged 16-25 years in metropolitan Sydney and rural NSW, by the use of a four Risky Driving Questionnaires. This study examined, for both metropolitan Sydney population and rural NSW population samples, whether young driver beliefs and attitudes differ across a range of risky driving behaviours, and whether there are different predictors for different behaviours. Study 2 also examined the generalizability of Study 1 results beyond the student population, particularly by comparing Study 1 predictors with those found in the metropolitan

Sydney population sample, for each risky driving behaviour. Finally, this study compared urban and rural data, particularly by comparing predictors found in the metropolitan Sydney population sample with those found in the rural NSW population sample, for each risky driving behaviour.

Method

Participants and sampling

Participants were 587 drivers from metropolitan Sydney and 422 drivers from rural NSW who were required to hold a current NSW drivers license. For the metropolitan Sydney sample, participants (age range of 16-25 years) were recruited outside six RTA Motor Registries (North Ryde, Campbelltown, Marrickville, Chatswood, Castle Hill and Parramatta) across the Sydney metropolitan area. For the rural NSW sample, participants (age range of 16-25 years) were recruited outside eight RTA Motor Registries (Nowra, Goulburn, Coffs Harbour, Muswellbrook, Tumut, Cooma, Queanbeyan, and Dubbo) across rural NSW. Registries were selected to represent a broad range of socioeconomic areas.

Initially, researchers administered corresponding questionnaire versions consecutively to participants. That is, for every four people agreeing to participate, researchers administered a 'speeding' questionnaire, followed by a 'drink-driving' questionnaire, then a 'not wearing seat belts' questionnaire, and then a 'driving while fatigued' questionnaire. Toward the end of recruitment, targeted sampling was employed to ensure equal proportions of male versus female respondents.

Questionnaire versions were distributed to 587 people in the metropolitan Sydney sample and 422 people in the rural NSW sample. Of these, a total of 212 people (118 in the metropolitan Sydney sample, and 94 in the rural NSW sample) were immediately excluded from further analysis due to the return of a substantially incomplete questionnaire (less than half completed), suggesting that a serious attempt at completion was not made. These omissions reduced the sample sizes for the speeding, drink-driving, driving while fatigued, and not wearing seat belts

behaviour models. Table 18 shows the final sample sizes, proportions of female participants, mean ages, and standard deviations of age, for each questionnaire version, for both Metropolitan Sydney and rural NSW samples.

Table 18: Sample sizes, percentage of female participants, mean ages, and standard deviations of age, for each questionnaire version, for both Metropolitan Sydney and rural NSW samples.

Questionnaire Version	Sample size	% Females	Mean Age (years)	SD Age (years)
Metropolitan Sydney sample				
"Speeding" version	127	49.6%	21.0	2.64
"Drink-driving" version	112	48.2%	21.3	2.44
"Driving while fatigued" version	116	53.4%	21.1	2.51
"Not wearing seat belts" version	114	49.1%	21.3	2.65
Rural NSW sample				
"Speeding" version	86	51.2%	19.2	1.83
"Drink-driving" version	82	31.7%	19.6	1.99
"Driving while fatigued" version	80	50.0%	20.5	2.17
"Not wearing seat belts" version	80	43.7%	19.6	1.82

Materials

Participant Information Sheet

The Participant Information Sheet was the same as in Study 1, with the exception that participants were also given details about a follow-up study requiring completion of a computer task and another questionnaire.

Consent Form

The Consent Form was the same as in Study 1, with the exception that participants were also asked to consent to being contacted regarding participation in a follow-up study, with a space given for providing a contact telephone number.

Revocation of Consent Form

The Revocation of Consent Form was the same as in Study 1.

Risky Driving Questionnaire

For each of the four risky driving behaviours examined, questions were presented in eleven sections. Each risky driving behaviour was packaged as one individual questionnaire version. The order of administration and content of the questionnaire sections was the same as in Study 1.

Procedure

Ethics approval was granted by the University of Sydney Ethics Committee, and ratified by the University of NSW Ethics Committee. Prior to data collection, all selected RTA motor registries were approached, to explain the nature of the research to be conducted. For all data collection sessions, data collectors worked in pairs, and stood outside and adjacent to the main entrance of each selected motor registry. All people entering the grounds of each motor registry who appeared to be between 16 and 25 years old were approached, and invited to participate in a study on "drivers' attitudes toward various risky driving behaviours" being conducted by researchers from the NSW Injury Risk Management Research Centre at the University of NSW in co-operation with the Motor Accidents Authority. Participants who confirmed that they were between 16 and 25 years old and held a current NSW drivers license were asked to complete a short questionnaire, taking approximately 10 minutes, while they waited for service inside the registry, and to return the questionnaire upon leaving. The refusal rate was approximately 35%.

Participants were assured that their involvement was entirely voluntary, that they could withdraw at any time, and that their responses would be confidential. In accordance with the 'Bogus

Pipeline' technique, all participants were told that researchers wished to check driving records as part of the study, and were asked to provide their Drivers' License number. All participants read the Participant Information Sheet, and were instructed to read all questions carefully and to answer each question as honestly as possible. Where possible, researchers checked returned questionnaires to ensure that all sections had been completed. Participants were encouraged to complete any remaining sections. All participants were debriefed and thanked for their participation.

Statistical Analyses

Data were analysed employing SPSS. A Type 1 error rate of 0.05 was employed for all analyses, and all tests were 2-tailed.

Data analysis was conducted as in Study 1.

Results

Statistical Analyses

Item Analysis

No items exhibited reasonably high proportions of responses (greater than 20%) for both "Neutral" and "Strongly disagree" response choices, together with low proportions for all other response options. Therefore, no items were omitted from further statistical analyses based on item irrelevance.

Scale construction

Illusory Invulnerability scales

Three illusory invulnerability scales were constructed for each behaviour – **road-unrelated illusory invulnerability, road-related general illusory invulnerability, and road-related specific illusory invulnerability** – with each scale comprising of two items. A factor analysis with all six illusory invulnerability items was undertaken for each behaviour. As expected, factor analysis revealed a three-factor structure for not wearing seat belts and driving while fatigued; however, a two-factor structure was found for speeding and drink-driving. This was observed for both metropolitan Sydney and rural NSW samples.

Table 19 shows the item correlations for all illusory invulnerability scales constructed for each of the four behaviours in Study 2, in both metropolitan Sydney and rural NSW samples. For the metropolitan Sydney sample, item correlations were satisfactory for all road-unrelated illusory invulnerability and road-related specific illusory invulnerability scales. For road-related general illusory invulnerability in the metropolitan Sydney sample, item correlation was satisfactory for speeding and drink-driving, but low (and not statistically significant) for driving while fatigued and not wearing seat belts. For the rural NSW sample, item correlations were satisfactory for all road-related general illusory invulnerability and road-related specific illusory invulnerability scales. For road-unrelated illusory invulnerability in the rural NSW sample, item correlation was satisfactory for driving while fatigued, but low (and not statistically significant) for the other behaviours.

Table 19: Item correlations for all road-related specific, road-related general, and road-unrelated illusory invulnerability scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples.[8]

	"Speeding" version	**"Drink-driving" version**	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**
Metropolitan Sydney sample				
α (road-unrelated)	0.19*	0.25**	0.26**	0.39**

[8] Road-unrelated and road-related general illusory invulnerability questions were the same for all behaviours. Different correlation values reflect the fact that different participants completed different questionnaire versions.

α (road-related general)	0.42**	0.39**	0.16	0.13
α (road-related specific)	0.54**	0.70**	0.75**	0.58**
Rural NSW sample				
α (road-unrelated)	-0.04	0.08	0.30**	0.14
α (road-related general)	0.23*	0.42**	0.31**	0.38**
α (road-related specific)	0.71**	0.49**	0.54**	0.59**

** Correlation is significant at the 0.001 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Perceived Severity scales

For **specific perceived severity** scales, for all four behaviours, factor analyses revealed that the relevant items assessed one factor, in both metropolitan Sydney and rural NSW samples. For **general perceived severity** scales in the metropolitan Sydney sample, factor analyses revealed either a one-factor structure (for speeding) or two-factor structure (for not wearing seat belts, driving while fatigued and drink-driving). For **general perceived severity** scales in the rural NSW sample, factor analyses revealed either a one-factor structure (for speeding and driving while fatigued) or two-factor structure (for not wearing seat belts and drink-driving). Table 20 shows Cronbach's Alpha for all perceived severity scales constructed for each of the four behaviours in Study 2, in both metropolitan Sydney and rural NSW samples. Reliability levels were acceptable for all perceived severity scales constructed, except for general perceived severity for not wearing seat belts in the rural NSW sample.

Table 20: Cronbach's Alpha reliability levels for all general perceived severity and general specific severity scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples.[9]

	"Speeding" version	**"Drink-driving" version**	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**
Metropolitan Sydney sample				

[9] General perceived severity questions were the same for all behaviours. Different Cronbach's Alpha values reflect the fact that different participants completed different questionnaire versions.

α (general severity)	0.69	0.65	0.66	0.55
α (specific severity)	0.62	0.80	0.73	0.85
Rural NSW sample				
α (general severity)	0.71	0.66	0.66	0.41
α (specific severity)	0.67	0.86	0.76	0.64

Perceived Susceptibility scales

For **specific perceived susceptibility** scales, for each of the four behaviours, factor analyses revealed that the relevant items assessed one factor, in both metropolitan Sydney and rural NSW samples. For **general perceived susceptibility** scales in the metropolitan Sydney sample, factor analyses revealed either a one-factor structure (for speeding, not wearing seat belts and drink-driving) or two-factor structure (for driving while fatigued). For **general perceived susceptibility** scales in the rural NSW sample, factor analyses revealed either a one-factor structure (for speeding) or two-factor structure (for not wearing seat belts, drink-driving and driving while fatigued).

Table 21 shows Cronbach's Alpha for all perceived susceptibility scales constructed for each of the four behaviours in Study 2, in both metropolitan Sydney and rural NSW samples. For the metropolitan Sydney sample, reliability levels were acceptable for all perceived susceptibility scales constructed. For the rural NSW sample, general perceived susceptibility scale reliabilities were reasonable for not wearing seat belts and speeding, but low for drink-driving and driving while fatigued. Reliability levels were acceptable for all specific perceived susceptibility scales constructed in the rural NSW sample, except for driving while fatigued.

Table 21: Cronbach's Alpha for all general perceived susceptibility and general specific susceptibility scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples.[10]

	"Speeding"	**"Drink-**	**"Driving While**	**"Not Wearing**

[10] General perceived susceptibility questions were the same for all behaviours. Different Cronbach's Alpha values reflect the fact that different participants completed different questionnaire versions.

	version	driving" version	Fatigued" version	Seat belts" version
Metropolitan Sydney sample				
α (general susceptibility)	0.68	0.66	0.54	0.55
α (specific susceptibility)	0.68	0.81	0.55	0.53
Rural NSW sample				
α (general susceptibility)	0.62	0.45	0.45	0.56
α (specific susceptibility)	0.75	0.77	0.14	0.71

Perceived Benefits scales

In the metropolitan Sydney sample, factor analyses revealed either a two-factor structure (for not wearing seat belts, speeding and drink-driving) or three-factor structure (for driving while fatigued). In the rural NSW sample, factor analyses revealed either a one-factor structure (for not wearing seat belts), two-factor structure (for speeding and drink-driving) or three-factor structure (for driving while fatigued). Table 22 shows Cronbach's Alpha for the perceived benefits scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples. Reliability levels were reasonable for all four behaviours, in both metropolitan Sydney and rural NSW samples.

Table 22: Cronbach's Alpha for perceived benefits scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples.

	"Speeding" version	"Drink-driving" version	"Driving While Fatigued" version	"Not Wearing Seat belts" version
α (Perceived benefits) – ***Metropolitan Sydney sample***	0.62	0.56	0.77	0.55
α (Perceived benefits) – ***Rural NSW sample***	0.58	0.75	0.72	0.76

Perceived Costs scales

In the metropolitan Sydney sample, factor analyses revealed either a one-factor structure (for not wearing seat belts, drink-driving and speeding) or two-factor structure (for driving while fatigued). In the rural NSW sample, factor analyses revealed either a one-factor structure (for not wearing seat belts) or two-factor structure (for driving while fatigued, drink-driving and speeding). Table 23 shows Cronbach's Alpha for the perceived costs scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples. Reliability levels were acceptable for all four behaviours, in both metropolitan Sydney and rural NSW samples.

Table 23: Cronbach's Alpha for perceived costs scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples.

	"Speeding" version	**"Drink-driving" version**	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**
α (Perceived costs) – ***Metropolitan Sydney sample***	0.75	0.66	0.63	0.80
α (Perceived costs) – ***Rural NSW sample***	0.68	0.62	0.54	0.78

Behavioural intentions scales

For each of the four behaviours, factor analyses revealed that the relevant items assessed one factor, in both metropolitan Sydney and rural NSW samples. Table 24 shows Cronbach's Alpha for the behavioural intention scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples. Reliability levels were acceptable for all four behaviours, in both metropolitan Sydney and rural NSW samples.

Table 24: Cronbach's Alpha for behavioural intention scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples.

	"Speeding" version	**"Drink-driving" version**	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**

α (Behavioural intentions) – ***Metropolitan Sydney sample***	0.91	0.81	0.69	0.89
α (Behavioural intentions) – ***Rural NSW sample***	0.88	0.86	0.68	0.91

Personality scales

Original instructions for the scoring of the Authority-Rebellion, Time Urgency, and Sensation Seeking personality scales, as well as the Marlowe-Crowne Social Desirability scale, were followed. For driver anger, as expected, factor analysis confirmed that the selected DAS items assessed more than one driver anger factor, in both metropolitan Sydney and rural NSW samples. Table 25 shows Cronbach's Alpha for the driver anger personality scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples. Reliability levels were acceptable for all four behaviours, in both metropolitan Sydney and rural NSW samples.

Table 25: Cronbach's Alpha for driver anger personality scales for each questionnaire version in Study 2, in both metropolitan Sydney and rural NSW samples.[11]

	"Speeding" version	**"Drink-driving" version**	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**
α (Driver anger) - ***Metropolitan Sydney sample***	0.72	0.69	0.68	0.70
α (Driver anger) – ***Rural NSW sample***	0.74	0.73	0.69	0.81

Descriptive Statistics

Tables 26-29 show the mean and standard deviation for all predictors in Study 1 for each of the four risky driving behaviours. For all behaviours, higher scores reflected lower endorsement of illusory invulnerability, HBM beliefs, peer influence and authority rebellion, and greater endorsement of time urgency, sensation seeking and driver anger. Similar mean endorsement

[11] Driver anger questions were the same for all behaviours. Different Cronbach's Alpha values reflect the fact that different participants completed different questionnaire versions.

levels were obtained for most predictors. In the metropolitan Sydney sample, higher specific perceived susceptibility was observed for drink-driving and speeding. In the rural NSW sample, lower specific perceived susceptibility endorsements were found for driving while fatigued, and lower road-related specific illusory invulnerability endorsements were found for speeding. For not wearing seat belts behaviour, lower specific perceived susceptibility endorsements were found in the rural NSW sample, compared with the student and metropolitan Sydney samples. For drink-driving behaviour, lower road-related specific illusory invulnerability endorsements were found in the rural NSW sample, compared with the student and metropolitan Sydney samples. For driving while fatigued behaviour, higher endorsement of perceived costs was obtained in the rural NSW sample, compared with the student and metropolitan Sydney samples.

Table 26: Mean and standard deviation for all predictors of speeding in Study 2, for both metropolitan Sydney and rural NSW samples.

Predictor	***Metropolitan Sydney sample***		***Rural NSW sample***		***Study 1 Student sample***	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Authority-rebellion personality scale	45.6	6.82	45.0	8.33	47.0	7.14
Time urgency personality scale	69.4	9.62	70.5	8.59	70.6	9.92
Sensation seeking personality scale	7.0	2.51	6.9	2.77	6.3	2.72
Driver anger personality scale	19.5	4.42	21.2	4.77	19.7	3.83
Road-unrelated illusory invulnerability	4.9	1.43	4.8	1.43	5.1	1.16
Road-related general illusory	5.1	1.54	5.0	1.54	5.3	1.63

invulnerability						
Road-related specific illusory invulnerability	5.2	1.78	6.0	2.52	5.5	1.99
Specific perceived severity	8.5	3.59	8.5	4.15	9.0	3.43
General perceived severity	14.4	6.23	11.8	5.12	15.3	5.24
General perceived susceptibility	18.4	4.69	18.5	4.68	18.1	4.48
Specific perceived susceptibility	5.9	3.17	5.5	2.85	5.1	2.14
Perceived benefits	16.7	5.12	15.1	5.09	14.6	4.30
Perceived costs	23.9	6.04	23.5	5.98	22.9	5.36
Peer influence	5.9	1.56	5.5	1.86	5.6	1.49

Table 27: Mean and standard deviation for all predictors of drink-driving in Study 2, for both metropolitan Sydney and rural NSW samples.

Predictor	***Metropolitan Sydney sample***		***Rural NSW sample***		***Study 1 Student sample***	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Authority-rebellion personality scale	46.5	7.25	44.5	7.93	47.0	7.14
Time urgency personality scale	68.8	10.17	70.1	8.68	70.6	9.92
Sensation seeking personality scale	7.0	2.46	7.6	2.23	6.3	2.72
Driver anger personality scale	19.1	4.26	19.0	4.65	19.7	3.83

Road-unrelated illusory invulnerability	4.8	1.51	4.4	1.32	5.1	1.16
Road-related general illusory invulnerability	4.9	1.44	4.7	1.75	5.3	1.63
Road-related specific illusory invulnerability	3.4	2.00	4.3	2.38	3.3	1.64
Specific perceived severity	7.7	4.27	8.6	5.05	8.0	3.98
General perceived severity	14.6	5.77	13.3	5.78	15.3	5.24
General perceived susceptibility	18.8	4.49	19.2	4.39	18.1	4.48
Specific perceived susceptibility	5.5	3.59	5.9	3.79	5.1	2.46
Perceived benefits	12.8	4.97	12.7	5.87	11.0	3.27
Perceived costs	25.5	6.32	24.4	6.42	26.9	4.48
Peer influence	5.9	1.61	5.1	2.02	6.0	1.52

Table 28: Mean and standard deviation for all predictors of driving while fatigued in Study 2, for both metropolitan Sydney and rural NSW samples.

Predictor	***Metropolitan Sydney sample***		***Rural NSW sample***		***Study 1 Student sample***	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**	**Mean**	**Standard Deviation**
Authority-rebellion personality scale	46.8	7.67	45.1	6.06	48.8	6.65
Time urgency	71.3	9.55	67.3	8.54	67.9	8.53

personality scale						
Sensation seeking personality scale	6.9	2.46	5.5	2.66	6.2	2.62
Driver anger personality scale	19.8	3.89	20.2	4.22	19.4	3.99
Road-unrelated illusory invulnerability	5.0	1.48	4.9	1.48	4.9	1.33
Road-related general illusory invulnerability	5.3	1.35	5.3	1.64	4.9	1.80
Road-related specific illusory invulnerability	4.6	2.19	4.4	2.08	4.7	2.03
Specific perceived severity	10.1	4.19	9.9	4.74	9.1	3.95
General perceived severity	14.6	6.00	12.6	5.14	16.2	5.60
General perceived susceptibility	17.8	3.94	17.1	3.73	19.1	5.10
Specific perceived susceptibility	8.5	3.26	7.9	2.34	8.1	2.88
Perceived benefits	22.1	7.68	22.0	6.98	21.2	6.80
Perceived costs	24.8	4.86	21.3	5.37	25.1	4.19
Peer influence	5.4	1.78	5.0	2.04	5.1	1.82

Table 29: Mean and standard deviation for all predictors of not wearing seat belts in Study 2, for both metropolitan Sydney and rural NSW samples.

	Metropolitan Sydney sample	***Rural NSW sample***	***Study 1 Student sample***

Predictor	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Authority-rebellion personality scale	47.1	7.23	45.3	7.84	48.8	6.6
Time urgency personality scale	71.9	9.04	67.1	8.86	67.9	8.53
Sensation seeking personality scale	7.0	2.35	6.7	2.16	6.2	2.62
Driver anger personality scale	20.0	4.08	20.2	5.49	19.4	3.99
Road-unrelated illusory invulnerability	4.8	1.51	5.0	1.56	4.9	1.33
Road-related general illusory invulnerability	5.2	1.41	5.4	1.84	4.9	1.80
Road-related specific illusory invulnerability	3.9	2.20	4.3	1.94	3.9	2.27
Specific perceived severity	8.3	4.28	8.2	3.56	8.3	4.14
General perceived severity	14.0	5.17	15.0	4.39	16.2	5.60
General perceived susceptibility	18.0	4.19	18.6	4.14	19.1	5.10
Specific perceived susceptibility	8.6	3.01	4.6	2.52	8.3	3.25
Perceived benefits	15.0	5.11	16.2	6.11	14.4	4.37
Perceived costs	30.0	5.52	28.7	5.44	30.2	5.33
Peer influence	6.2	1.45	6.4	.96	6.4	1.32

Correlations between Social Desirability Scores and All Factors Examined

Metropolitan Sydney sample

Table 30 shows statistical significance levels for Pearson correlations between Marlowe-Crowne social desirability scores and all demographic, personality, attitudinal, and behaviour factors for Study 2, in the metropolitan Sydney sample. Social desirability correlated significantly with road-unrelated general illusory invulnerability for driving while fatigued (r=-0.21; p=0.023), and with behavioural intentions for drink-driving (r=-0.19; p=0.043). For speeding, social desirability correlated significantly with driver anger (r=-0.19; p=0.037), peer influence (r=0.30; p=0.001), behavioural intentions (r=-0.20; p=0.022), road-related general illusory invulnerability (r=-0.19; p=0.037), road-related specific illusory invulnerability (r=-0.27; p=0.003), general susceptibility (r=0.29; p=0.001), and perceived costs (r=0.22; p=0.014). Social desirability scores did not correlate significantly with any factors for not wearing seat belt behaviour. Regression analyses for driving while fatigued, drink-driving and speeding will include social desirability as a separate additional predictor in a fourth regression model, after all other predictors have been included.

Table 30: Statistical significance levels for Pearson correlations between social desirability and all demographic, personality, attitudinal, and behaviour factors in Study 2, for each of the four risky driving behaviours in the metropolitan Sydney sample.

FACTOR	**Speeding**	**Drink-driving**	**Driving While Fatigued**	**Not Wearing Seat Belts**
Gender	.761	.853	.187	.577
Age	.735	.720	.873	.736
Authority-Rebellion	.444	.674	.082	.127
Time Urgency	.359	.399	.674	.278
Sensation Seeking	.744	.352	.426	.623
Driver Anger	.037*	.231	.542	.098
Behavioural Intentions	.022*	.043*	.098	.964

Specific Severity	.689	.256	.244	.815
General Severity	.497	.326	.815	.659
Road-Related General Illusory Invulnerability	.037*	.422	.198	.942
Road-Unrelated General Illusory Invulnerability	.908	.731	.023*	.128
Road-Related Specific Illusory Invulnerability	.003**	.403	.143	.437
General Susceptibility	.001**	.201	.743	.280
Specific Susceptibility	.519	.335	.823	.622
Benefits	.231	.931	.950	.539
Costs	.014*	.053	.852	.640
Peer influence	.001**	.167	.660	.567

** Correlation is significant at the 0.001 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Rural NSW sample

Table 31 shows statistical significance levels for Pearson correlations between Marlowe-Crowne social desirability scores and all demographic, personality, attitudinal, and behaviour factors for Study 2, in the rural NSW sample. For driving while fatigued, social desirability correlated significantly with age (r=0.23; p=0.039), authority rebellion (r=0.23; p=0.039), and specific susceptibility (r=-0.30; p=0.007). For not wearing seat belts, social desirability correlated significantly with authority rebellion (r=0.23; p=0.041), driver anger (r=-0.25; p=0.027), road-related general illusory invulnerability (r=-0.25; p=0.027), and general susceptibility (r=0.28; p=0.015). For speeding, social desirability correlated significantly with authority rebellion (r=0.31; p=0.005), behavioural intentions (r=-0.39; p<0.001), general susceptibility (r=0.35; p=0.001), and peer influence (r=0.38; p<0.001). For drink-driving, social desirability correlated significantly with road-related general illusory invulnerability (r=-0.26; p=0.025). Regression analyses for all four behaviours will include social desirability as a separate additional predictor in a fourth regression model, after all other predictors have been included.

Table 31: Statistical significance levels for Pearson correlations between social desirability and all demographic, personality, attitudinal, and behaviour factors in Study 2, for each of the four risky driving behaviours in the rural NSW sample.

FACTOR	Speeding	Drink-driving	Driving While Fatigued	Not Wearing Seat Belts
Gender	.878	.449	.334	.512
Age	.115	.252	.039*	.855
Authority-Rebellion	.005**	.454	.039*	.041*
Time Urgency	.210	.158	.271	.584
Sensation Seeking	.725	.313	.634	.639
Driver Anger	.220	.067	.255	.027*
Behavioural Intentions	<.001**	.662	.753	.086
Road-Unrelated General Illusory Invulnerability	.303	.426	.369	.158
Road-Related General Illusory Invulnerability	.753	.025*	.520	.027*
Road-Related Specific Illusory Invulnerability	.154	.614	.137	.508
Specific Severity	.443	.896	.499	.604
General Severity	.813	.425	.633	.681
General Susceptibility	.001**	.243	.441	.015*
Specific Susceptibility	.185	.428	.007**	.294
Benefits	.081	.651	.330	.666
Costs	.117	.573	.265	.367
Peer influence	<.001**	.184	.582	.659

** Correlation is significant at the 0.001 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Metropolitan Sydney sample – Regression Analyses

'Speeding' behaviour model

The three-step hierarchical regression analysis for the prediction of speeding behaviour in the metropolitan Sydney sample is summarised in Table 32. For speeding behaviour, the overall proportion of variance accounted for by the final regression model was 49.0% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for speeding, gender significantly predicted the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, gender continued to predict speeding, along with driver anger. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, gender no longer predicted the behaviour – however, driver anger continued to predict speeding, along with authority rebellion, road-unrelated illusory invulnerability, road-related specific illusory invulnerability, perceived costs of not speeding, and perceived benefits of not speeding. After social desirability was included as a covariate, all of these factors (except road-related specific illusory invulnerability) continued to significantly predict speeding. When all factors and covariates had been accounted for in the final hierarchical regression model, speeding behaviour was significantly predicted by **driver anger**, **authority rebellion**, **road-unrelated illusory invulnerability**, **perceived costs of not speeding**, and **perceived benefits of not speeding**.

Table 32: Summary of Study 2 regression analyses results for speeding behaviour in the metropolitan Sydney sample, illustrating the factors predicting the behaviour within each of the four hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**
Model 1: Demographics only			
Gender	-74.006	-4.311	<.001**
Age	1.603	.484	.630
Model 2: Demographics plus personality factors			
Gender	-75.239	-4.590	<.001**
Age	2.491	.805	.423
Authority-Rebellion	.456	.370	.712
Time Urgency	1.755	1.948	.054

Sensation Seeking	-2.607	-.807	.421
Driver Anger	7.371	3.820	<.001**
Model 3: Demographics plus personality factors plus attitudes			
Gender	-24.428	-1.519	.132
Age	2.585	.929	.355
Authority-Rebellion	2.297	2.040	.044*
Time Urgency	-.630	-.771	.443
Sensation Seeking	.576	.203	.839
Driver Anger	4.325	2.496	.014*
Road-Unrelated Illusory Invulnerability	-13.198	-2.482	.015*
Road-Related General Illusory Invulnerability	3.134	.524	.602
Road-Related Specific Illusory Invulnerability	10.148	1.994	.049*
Specific Perceived Severity	3.616	1.744	.084
General Perceived Severity	-.905	-.670	.504
General Perceived Susceptibility	-2.842	-1.368	.174
Specific Perceived Susceptibility	2.538	.876	.383
Perceived Costs	-3.506	-2.235	.028*
Perceived Benefits	4.723	2.691	.008**
Peer influence	4.196	.727	.469
Model 4: Demographics plus personality factors plus attitudes (plus social desirability)			
Gender	-25.250	-1.546	.125
Age	2.563	.917	.361
Authority-Rebellion	2.316	2.045	.043*
Time Urgency	-.617	-.750	.455
Sensation Seeking	.527	.185	.854
Driver Anger	4.264	2.436	.017*
Road-Unrelated Illusory Invulnerability	-13.177	-2.467	.015*
Road-Related General Illusory Invulnerability	2.985	.495	.622
Road-Related Specific Illusory Invulnerability	9.956	1.935	.056
Specific Perceived Severity	3.565	1.708	.091
General Perceived Severity	-.922	-.679	.499

General Perceived Susceptibility	-2.767	-1.318	.191
Specific Perceived Susceptibility	2.594	.890	.376
Perceived Costs	-3.512	-2.229	.028*
Perceived Benefits	4.725	2.680	.009**
Peer influence	4.683	.783	.435
Social Desirability	-.923	-.335	.738

** Significant at the 0.001 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

'Drink-Driving' behaviour model

The three-step hierarchical regression analysis for the prediction of drink-driving behaviour in the metropolitan Sydney sample is summarised in Table 33. For drink-driving behaviour, the overall proportion of variance accounted for by the final regression model was 38.7% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for drink-driving, gender significantly predicted the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, gender continued to predict drink-driving, along with driver anger. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, gender and driver anger no longer predicted drink-driving behaviour – however, road-unrelated illusory invulnerability, perceived costs of not drink-driving, and peer influence significantly predicted drink-driving. After social desirability was included as a covariate, all of these factors continued to significantly predict the behaviour. When all factors and covariates had been accounted for in the final hierarchical regression model, drink-driving behaviour was significantly predicted by **road-unrelated illusory invulnerability**, **perceived costs of not drink-driving**, and **peer influence**.

Table 33: Summary of Study 2 regression analyses results for drink-driving behaviour in the metropolitan Sydney sample, illustrating the factors predicting the behaviour within each of the four hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**

Model 1: Demographics only			
Gender	-56.325	-3.530	.001**
Age	1.088	.330	.742
Model 2: Demographics plus personality factors			
Gender	-54.898	-3.433	.001**
Age	.161	.051	.960
Authority-Rebellion	-1.700	-1.482	.142
Time Urgency	.365	.438	.662
Sensation Seeking	.849	.271	.787
Driver Anger	6.610	3.592	.001**
Model 3: Demographics plus personality factors plus attitudes			
Gender	-29.319	-1.722	.089
Age	2.699	.882	.381
Authority-Rebellion	-.568	-.500	.619
Time Urgency	-1.247	-1.489	.140
Sensation Seeking	1.741	.570	.570
Driver Anger	3.573	1.929	.057
Road-Unrelated Illusory Invulnerability	-13.444	-2.552	.012*
Road-Related General Illusory Invulnerability	9.331	1.517	.133
Road-Related Specific Illusory Invulnerability	7.396	1.770	.080
Specific Perceived Severity	-.010	-.006	.995
General Perceived Severity	.425	.322	.748
General Perceived Susceptibility	.224	.112	.911
Specific Perceived Susceptibility	4.800	1.680	.097
Perceived Costs	-5.395	-3.233	.002**
Perceived Benefits	1.388	.809	.421
Peer influence	16.122	2.447	.016*
Model 4: Demographics plus personality factors plus attitudes (plus social desirability)			
Gender	-29.104	-1.735	.086
Age	2.477	.820	.414
Authority-Rebellion	-.694	-.618	.538

Time Urgency	-1.331	-1.611	.111
Sensation Seeking	2.462	.812	.419
Driver Anger	3.526	1.932	.057
Road-Unrelated Illusory Invulnerability	-13.910	-2.677	.009**
Road-Related General Illusory Invulnerability	8.751	1.442	.153
Road-Related Specific Illusory Invulnerability	6.598	1.594	.115
Specific Perceived Severity	-.313	-.183	.855
General Perceived Severity	.229	.175	.861
General Perceived Susceptibility	.364	.185	.854
Specific Perceived Susceptibility	4.879	1.733	.087
Perceived Costs	-5.091	-3.081	.003**
Perceived Benefits	1.573	.929	.356
Peer influence	15.978	2.461	.016*
Social Desirability	-5.124	-1.884	.063

** Significant at the 0.001 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

'Driving While Fatigued' behaviour model

The three-step hierarchical regression analysis for the prediction of driving while fatigued behaviour in the metropolitan Sydney sample is summarised in Table 34. For driving while fatigued behaviour, the overall proportion of variance accounted for by the final regression model was 11.0% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for driving while fatigued, age and gender did not predict the behaviour. Similarly, when personality factors were added in the *'Demographics plus personality factors' Model*, no factor significantly predicted driving while fatigued. However, when attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, driving while fatigued was significantly predicted by **perceived benefits of not driving while fatigued**. This factor continued to significantly predict driving while fatigued when social desirability was added as a covariate in the final regression model.

Table 34: Summary of Study 2 regression analyses results for driving while fatigued behaviour in the metropolitan Sydney sample, illustrating the factors predicting the behaviour within each of the four hierarchical models.

PREDICTOR	β-coefficient	t-value	p-value
Model 1: Demographics only			
Gender	-28.182	-1.591	.115
Age	-1.153	-.328	.744
Model 2: Demographics plus personality factors			
Gender	-30.337	-1.640	.104
Age	-3.136	-.854	.395
Authority-Rebellion	-1.098	-1.007	.317
Time Urgency	1.442	1.562	.121
Sensation Seeking	-1.000	-.277	.783
Driver Anger	3.005	1.367	.175
Model 3: Demographics plus personality factors plus attitudes			
Gender	-12.762	-.629	.531
Age	-2.454	-.641	.523
Authority-Rebellion	-.145	-.103	.918
Time Urgency	.574	.560	.577
Sensation Seeking	.534	.143	.886
Driver Anger	2.364	1.057	.293
Road-Unrelated Illusory Invulnerability	-3.867	-.617	.539
Road-Related General Illusory Invulnerability	4.068	.538	.592
Road-Related Specific Illusory Invulnerability	.009	.002	.998
Specific Perceived Severity	1.187	.534	.595
General Perceived Severity	-2.636	-1.660	.100
General Perceived Susceptibility	-1.232	-.468	.641
Specific Perceived Susceptibility	-4.680	-1.406	.163
Perceived Costs	-3.618	-1.698	.093
Perceived Benefits	4.684	3.291	.001**

Peer influence	2.681	.474	.637
Model 4: Demographics plus personality factors plus attitudes (plus social desirability)			
Gender	-18.569	-.914	.363
Age	-2.725	-.719	.474
Authority-Rebellion	.287	.203	.840
Time Urgency	.458	.452	.652
Sensation Seeking	-.389	-.105	.917
Driver Anger	1.650	.734	.465
Road-Unrelated Illusory Invulnerability	-5.427	-.868	.388
Road-Related General Illusory Invulnerability	3.075	.411	.682
Road-Related Specific Illusory Invulnerability	.539	.119	.906
Specific Perceived Severity	.467	.209	.835
General Perceived Severity	-2.536	-1.615	.110
General Perceived Susceptibility	-1.921	-.730	.467
Specific Perceived Susceptibility	-3.792	-1.140	.258
Perceived Costs	-3.862	-1.831	.070
Perceived Benefits	4.446	3.147	.002**
Peer influence	4.087	.724	.471
Social Desirability	-5.448	-1.775	.079

** Significant at the 0.001 level (2-tailed).

'Not Wearing Seat Belts' behaviour model

The three-step hierarchical regression analysis for the prediction of not wearing seat belt behaviour in the metropolitan Sydney sample is summarised in Table 35. For not wearing seat belt behaviour, the overall proportion of variance accounted for by the final regression model was 24.5% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for not wearing seat belts, age and gender did not predict the behaviour. Similarly, when personality factors were added in the *'Demographics plus personality factors' Model*, no factor significantly predicted not wearing a seat belt. However, when all factors had been accounted for in the *'Demographics plus personality factors plus*

attitudes' Model, not wearing a seat belt was significantly predicted by **road-related specific illusory invulnerability** and **perceived costs of wearing a seat belt**.

Table 35: Summary of Study 2 regression analyses results for not wearing seat belt behaviour in the metropolitan Sydney sample, illustrating the factors predicting the behaviour within each of the three hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**
Model 1: Demographics only			
Gender	12.089	1.506	.135
Age	1.020	.665	.508
Model 2: Demographics plus personality factors			
Gender	13.718	1.582	.117
Age	1.033	.653	.515
Authority-Rebellion	.063	.103	.918
Time Urgency	.160	.327	.744
Sensation Seeking	2.082	1.168	.246
Driver Anger	.480	.444	.658
Model 3: Demographics plus personality factors plus attitudes			
Gender	-7.828	-.876	.384
Age	.636	.434	.665
Authority-Rebellion	-.915	-1.573	.120
Time Urgency	.341	.770	.444
Sensation Seeking	2.553	1.614	.110
Driver Anger	-.067	-.068	.946
Road-Unrelated Illusory Invulnerability	3.512	1.255	.213
Road-Related General Illusory Invulnerability	-1.991	-.659	.512
Road-Related Specific Illusory Invulnerability	-3.932	-2.201	.031*
General Perceived Severity	-1.141	-1.558	.123
General Perceived Susceptibility	1.690	1.569	.120
Specific Perceived Susceptibility	-.879	-.674	.502

Specific Perceived Severity	-.686	-.834	.407
Perceived Costs	2.388	2.436	.017*
Perceived Benefits	-1.349	-1.579	.118
Peer influence	-1.050	-.325	.746

* Significant at the 0.05 level (2-tailed).

Rural NSW sample – Regression Analyses

'Speeding' behaviour model

The three-step hierarchical regression analysis for the prediction of speeding behaviour in the rural NSW sample is summarised in Table 36. For speeding behaviour, the overall proportion of variance accounted for by the final regression model was 63.2% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for speeding, age significantly predicted the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, age no longer predicted the behaviour – however, authority rebellion, time urgency, and driver anger significantly predicted speeding. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, authority rebellion no longer predicted the behaviour – however, time urgency and driver anger continued to predict speeding, along with sensation seeking, road-related general illusory invulnerability, road-related specific illusory invulnerability, general perceived susceptibility, and peer influence, even after the inclusion of social desirability as a covariate. When all factors and covariates had been accounted for in the final hierarchical regression model, speeding behaviour was significantly predicted by **time urgency**, **sensation seeking**, **driver anger**, **road-related general illusory invulnerability**, **road-related specific illusory invulnerability**, **general perceived susceptibility**, and **peer influence**.

Table 36: Summary of Study 2 regression analyses results for speeding behaviour in the rural NSW sample, illustrating the factors predicting the behaviour within each of the four hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**

Model 1: Demographics only			
Gender	-25.487	-1.290	.201
Age	22.838	4.198	<.001**
Model 2: Demographics plus personality factors			
Gender	-3.554	-.175	.862
Age	6.808	1.151	.253
Authority-Rebellion	-2.725	-2.138	.036*
Time Urgency	2.422	2.212	.030*
Sensation Seeking	-6.910	-1.741	.086
Driver Anger	8.990	4.437	<.001**
Model 3: Demographics plus personality factors plus attitudes			
Gender	-21.080	-1.040	.302
Age	4.048	.799	.427
Authority-Rebellion	-1.720	-1.556	.125
Time Urgency	2.942	2.776	.007**
Sensation Seeking	-9.662	-2.886	.005**
Driver Anger	7.920	4.362	<.001**
Road-Unrelated Illusory Invulnerability	13.669	1.829	.072
Road-Related General Illusory Invulnerability	-25.525	-3.548	.001**
Road-Related Specific Illusory Invulnerability	10.910	2.850	.006**
Specific Perceived Severity	2.889	1.125	.265
General Perceived Severity	4.131	1.599	.115
General Perceived Susceptibility	-6.267	-2.458	.017*
Specific Perceived Susceptibility	-3.616	-.994	.324
Perceived Costs	2.672	1.644	.105
Perceived Benefits	-.125	-.058	.954
Peer influence	-18.404	-3.792	<.001**
Model 4: Demographics plus personality factors plus attitudes (plus social desirability)			
Gender	-25.510	-1.248	.217
Age	3.304	.651	.517
Authority-Rebellion	-1.124	-.943	.349

Time Urgency	2.845	2.692	.009**
Sensation Seeking	-8.777	-2.582	.012*
Driver Anger	8.143	4.489	<.001**
Road-Unrelated Illusory Invulnerability	14.388	1.931	.058
Road-Related General Illusory Invulnerability	-25.720	-3.593	.001**
Road-Related Specific Illusory Invulnerability	10.429	2.726	.008**
Specific Perceived Severity	2.871	1.123	.266
General Perceived Severity	4.544	1.755	.084
General Perceived Susceptibility	-6.371	-2.511	.015*
Specific Perceived Susceptibility	-4.039	-1.112	.270
Perceived Costs	2.975	1.821	.073
Perceived Benefits	-.288	-.135	.893
Peer influence	-15.630	-2.961	.004**
Social Desirability	-4.136	-1.299	.199

** Significant at the 0.001 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

'Drink-Driving' behaviour model

The three-step hierarchical regression analysis for the prediction of drink-driving behaviour in the rural NSW sample is summarised in Table 37. For drink-driving behaviour, the overall proportion of variance accounted for by the final regression model was 21.0% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for drink-driving, age and gender did not predict the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, authority rebellion and driver anger significantly predicted drink-driving. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, authority rebellion and driver anger no longer predicted drink-driving – however, road-related specific illusory invulnerability, specific perceived susceptibility, and peer influence significantly predicted the behaviour. After social desirability was included as a covariate, all of these factors continued to significantly predict the behaviour, and driver anger was also shown to be a significant predictor of drink-driving. When all factors and covariates had been accounted

for in the final hierarchical regression model, drink-driving behaviour was significantly predicted by **driver anger**, **road-related specific illusory invulnerability**, **specific perceived susceptibility**, and **peer influence**.

Table 37: Summary of Study 2 regression analyses results for drink-driving behaviour in the rural NSW sample, illustrating the factors predicting the behaviour within each of the four hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**
Model 1: Demographics only			
Gender	-19.924	-.862	.392
Age	-2.386	-.453	.652
Model 2: Demographics plus personality factors			
Gender	-21.389	-.934	.354
Age	-1.066	-.201	.841
Authority-Rebellion	-2.778	-2.118	.038*
Time Urgency	-.455	-.388	.699
Sensation Seeking	4.064	.880	.382
Driver Anger	6.054	2.526	.014*
Model 3: Demographics plus personality factors plus attitudes			
Gender	-28.931	-1.086	.282
Age	-.508	-.079	.937
Authority-Rebellion	-2.735	-1.828	.073
Time Urgency	-.595	-.459	.648
Sensation Seeking	-5.263	-.836	.407
Driver Anger	4.937	1.813	.075
Road-Unrelated Illusory Invulnerability	-9.091	-.893	.376
Road-Related General Illusory Invulnerability	-3.182	-.457	.650
Road-Related Specific Illusory Invulnerability	14.366	2.440	.018*
Specific Perceived Severity	-1.953	-.715	.478
General Perceived Severity	1.521	.653	.517

General Perceived Susceptibility	.013	.004	.997
Specific Perceived Susceptibility	11.492	2.461	.017*
Perceived Costs	3.522	1.312	.195
Perceived Benefits	-5.180	-1.768	.082
Peer influence	-14.125	-2.070	.043*
Model 4: Demographics plus personality factors plus attitudes (plus social desirability)			
Gender	-30.126	-1.136	.261
Age	-1.255	-.196	.846
Authority-Rebellion	-2.715	-1.824	.073
Time Urgency	-.209	-.158	.875
Sensation Seeking	-4.821	-.769	.445
Driver Anger	5.715	2.057	.044*
Road-Unrelated Illusory Invulnerability	-11.993	-1.155	.253
Road-Related General Illusory Invulnerability	-.549	-.076	.940
Road-Related Specific Illusory Invulnerability	14.036	2.394	.020*
Specific Perceived Severity	-2.258	-.828	.411
General Perceived Severity	1.945	.831	.410
General Perceived Susceptibility	.063	.020	.984
Specific Perceived Susceptibility	10.948	2.347	.022*
Perceived Costs	4.070	1.505	.138
Perceived Benefits	-5.043	-1.730	.089
Peer influence	-14.662	-2.156	.035*
Social Desirability	5.446	1.269	.210

* Significant at the 0.05 level (2-tailed).

'Driving While Fatigued' behaviour model

The three-step hierarchical regression analysis for the prediction of driving while fatigued behaviour in the rural NSW sample is summarised in Table 38. For driving while fatigued behaviour, the overall proportion of variance accounted for by the final regression model was 76.0% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for driving while fatigued, gender significantly

predicted the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, gender continued to significantly predict driving while fatigued, along with driver anger. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, driver anger no longer predicted the behaviour – however, gender continued to predict driving while fatigued, along with road-related specific illusory invulnerability and peer influence. After social desirability was included as a covariate, all of these factors continued to significantly predict the behaviour, and specific perceived susceptibility was also shown to be a significant predictor of driving while fatigued. When all factors and covariates had been accounted for in the final hierarchical regression model, driving while fatigued behaviour was significantly predicted by **gender**, **road-related specific illusory invulnerability**, **specific perceived susceptibility** and **peer influence**.

Table 38: Summary of Study 2 regression analyses results for driving while fatigued behaviour in the rural NSW sample, illustrating the factors predicting the behaviour within each of the four hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**
Model 1: Demographics only			
Gender	-62.458	-3.388	.001**
Age	3.112	.736	.465
Model 2: Demographics plus personality factors			
Gender	-49.121	-3.143	.003**
Age	3.383	.955	.343
Authority-Rebellion	.615	.421	.675
Time Urgency	.884	.968	.337
Sensation Seeking	-.075	-.026	.980
Driver Anger	11.210	5.368	<.001**
Model 3: Demographics plus personality factors plus attitudes			
Gender	-44.728	-3.300	.002**
Age	-3.396	-1.204	.234
Authority-Rebellion	2.882	1.805	.077

Time Urgency	-.558	-.644	.522
Sensation Seeking	-.752	-.261	.795
Driver Anger	3.243	1.683	.098
Road-Unrelated Illusory Invulnerability	6.244	1.266	.211
Road-Related General Illusory Invulnerability	-1.836	-.453	.652
Road-Related Specific Illusory Invulnerability	17.485	4.056	<.001**
Specific Perceived Severity	3.418	1.718	.092
General Perceived Severity	-1.770	-1.051	.298
General Perceived Susceptibility	-2.358	-1.337	.187
Specific Perceived Susceptibility	6.588	1.901	.063
Perceived Benefits	-.922	-.694	.491
Perceived Costs	.620	.356	.724
Peer influence	-8.235	-2.197	.032*
Model 4: Demographics plus personality factors plus attitudes (plus social desirability)			
Gender	-41.480	-3.066	.003**
Age	-4.213	-1.488	.143
Authority-Rebellion	2.448	1.531	.132
Time Urgency	-.549	-.644	.523
Sensation Seeking	-1.190	-.416	.679
Driver Anger	3.347	1.760	.084
Road-Unrelated Illusory Invulnerability	7.132	1.457	.151
Road-Related General Illusory Invulnerability	-2.872	-.709	.482
Road-Related Specific Illusory Invulnerability	17.316	4.071	<.001**
Specific Perceived Severity	3.439	1.753	.086
General Perceived Severity	-1.301	-.770	.445
General Perceived Susceptibility	-2.438	-1.401	.167
Specific Perceived Susceptibility	8.063	2.274	.027*
Perceived Benefits	-1.228	-.926	.359
Perceived Costs	.554	.322	.748
Peer influence	-8.646	-2.333	.024*
Social Desirability	2.778	1.564	.124

** Significant at the 0.001 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

'Not Wearing Seat Belts' behaviour model

The three-step hierarchical regression analysis for the prediction of not wearing seat belt behaviour in the rural NSW sample is summarised in Table 39. For not wearing seat belt behaviour, the overall proportion of variance accounted for by the final regression model was 48.3% (based on "Adjusted R Square" values), and the regression model was statistically significant. In the *'Demographics only' Model* for not wearing seat belts, gender significantly predicted the behaviour. When personality factors were added in the *'Demographics plus personality factors' Model*, gender continued to significantly predict not wearing a seat belt, along with age and driver anger. When attitudes and beliefs were added in the *'Demographics plus personality factors plus attitudes' Model*, age and gender no longer predicted the behaviour – however, driver anger continued to predict not wearing a seat belt, along with authority rebellion, sensation seeking, road-unrelated illusory invulnerability, specific perceived severity, and perceived benefits of wearing a seat belt. After social desirability was included as a covariate, all of these factors continued to significantly predict the behaviour. When all factors and covariates had been accounted for in the final hierarchical regression model, not wearing a seat belt behaviour was significantly predicted by **driver anger**, **authority rebellion**, **sensation seeking**, **road-unrelated illusory invulnerability**, **specific perceived severity**, and **perceived benefits of wearing a seat belt**.

Table 39: Summary of Study 2 regression analyses results for not wearing seat belt behaviour in the rural NSW sample, illustrating the factors predicting the behaviour within each of the three hierarchical models.

PREDICTOR	**β-coefficient**	**t-value**	**p-value**
Model 1: Demographics only			
Gender	37.008	3.544	.001**
Age	5.340	1.818	.073
Model 2: Demographics plus personality factors			

Gender	36.923	2.504	.015*
Age	6.933	2.325	.023*
Authority-Rebellion	.034	.041	.967
Time Urgency	-.419	-.548	.585
Sensation Seeking	5.114	1.810	.075
Driver Anger	-2.095	-2.491	.015*
Model 3: Demographics plus personality factors plus attitudes			
Gender	8.692	.564	.575
Age	4.151	1.543	.128
Authority-Rebellion	2.128	2.665	.010*
Time Urgency	-1.091	-1.323	.191
Sensation Seeking	7.508	3.005	.004**
Driver Anger	-2.262	-2.053	.044*
Road-Unrelated Illusory Invulnerability	11.450	4.067	<.001**
Road-Related General Illusory Invulnerability	-3.223	-1.258	.213
Road-Related Specific Illusory Invulnerability	-2.564	-.911	.366
Specific Perceived Severity	6.158	4.513	<.001**
General Perceived Severity	1.184	1.113	.270
General Perceived Susceptibility	-1.461	-.654	.515
Specific Perceived Susceptibility	1.642	.589	.558
Perceived Costs	.260	.180	.858
Perceived Benefits	-2.754	-2.608	.011*
Peer influence	-10.362	-1.861	.068
Model 4: Demographics plus personality factors plus attitudes (plus social desirability)			
Gender	10.730	.671	.505
Age	4.312	1.584	.119
Authority-Rebellion	1.901	2.086	.041*
Time Urgency	-1.027	-1.225	.225
Sensation Seeking	7.448	2.960	.004**
Driver Anger	-2.255	-2.034	.046*
Road-Unrelated Illusory Invulnerability	11.144	3.855	<.001**

Road-Related General Illusory Invulnerability	-2.659	-.954	.344
Road-Related Specific Illusory Invulnerability	-2.502	-.882	.381
Specific Perceived Severity	6.118	4.451	<.001**
General Perceived Severity	1.194	1.115	.269
General Perceived Susceptibility	-1.705	-.744	.460
Specific Perceived Susceptibility	2.128	.721	.474
Perceived Costs	.589	.372	.711
Perceived Benefits	-2.825	-2.638	.011*
Peer influence	-10.210	-1.820	.074
Social Desirability	1.054	.529	.599

** Significant at the 0.001 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

Discussion

Study 2 again tested the apparent assumption that demographic, personality, and attitudinal factors contribute to risky driving behaviours in the same way, regardless of the behaviour. Furthermore, Study 2 examined the generalizability of Study 1 results beyond the first-year psychology population (by allowing comparison of predictors in the Study 1 student population and metropolitan Sydney samples), and examined urban and rural differences (by allowing comparison of predictors in the metropolitan Sydney and rural NSW samples), for each risky driving behaviour under examination.

As in Study 1, Study 2 results illustrate that, for both metropolitan Sydney and rural NSW samples, different predictors are relevant to individual risky driving behaviours. Similarly, for both metropolitan Sydney and rural NSW samples, specific attitudes and beliefs associated with different dimensions of the HBM appear to be the strongest predictors of risky driving behaviour. Study 2 also illustrated some differences in terms of prediction of risky driving behaviours across population samples – both between student and metropolitan Sydney samples, and metropolitan Sydney and rural NSW samples.

Comparison of Study 1 Student Sample and Metropolitan Sydney Sample

Study 2 results demonstrate some differences in terms of prediction of risky driving behaviours between the Study 1 student sample and the present metropolitan Sydney sample. For all behaviours, at least one of the predictors found to be significant in the first-year psychology student sample were different to the significant predictors found in the metropolitan Sydney sample, supporting our previous research on risky driving (Fernandes & Job, 2003). Nonetheless, some of the predictors uncovered in the student sample were also found in the metropolitan Sydney sample, suggesting that these factors may be useful in guiding future road safety research, policy and practice.

In Study 1, **speeding** behaviour was significantly predicted by gender, sensation seeking, driver anger, road-unrelated illusory invulnerability, general perceived susceptibility, and specific perceived susceptibility. For Study 2, however, authority rebellion, driver anger, road-unrelated illusory invulnerability, as well as the perceived costs and perceived benefits of not speeding, were significant predictors of the behaviour. Of all predictors of speeding in the metropolitan Sydney sample, only driver anger and road-unrelated illusory invulnerability were predictive of speeding in both Study 1 student population and metropolitan Sydney samples, suggesting that they may be critical contributors to speeding. This supports past findings illustrating that driver anger, in particular, may be an influential factor for speeding behaviour (Dahlen et al., 2005; O'Brien et al., 2002; Beirness, 1993; Jonah, 1986). Lower perceived likelihood that negative events (unrelated to driving) will happen to them (compared peers of the same age and gender), as well as higher anger elicited from driving situations, was associated with more frequent speeding behaviour.

Study 2 results suggest that higher endorsement of the costs of driving within the speed limit (such as taking longer to get to a destination and not being able to keep up with traffic), and lower endorsement of the benefits of driving within the speed limit (such as saving money on petrol consumption and avoiding engine wear and tear), was associated with frequent speeding behaviour. Issues relating to saving driving time supports previous research on risk utility,

suggesting that drivers more likely to speed are also more likely to view being on time for appointments as desirable (Adams-Guppy & Guppy, 1995). Authority rebellion was a significant personality predictor of speeding behaviour in Study 2. One possible explanation for this finding relates to speeding being under the control of the driver. For example, a person may drive within the legal speed limit for most of their journey. However, they may also choose to speed whenever they feel they cannot be caught. Drivers often believe they know where regular speed cameras are situated, or if there is a police car driving in nearby traffic. In this sense, speeding is under the control of the driver, and may be more appealing to rebellious individuals.

In Study 1, peer influence was the only significant predictor of **drink-driving** behaviour. For Study 2, peer influence, as well as road-unrelated illusory invulnerability and the perceived costs of not drink-driving, significantly predicted the behaviour. The association between peer influence and intention to drink-drive suggests that greater peer influence is associated with more frequent drink-driving behaviour for this metropolitan Sydney sample. Peer influence was predictive of drink-driving in both Study 1 student population and metropolitan Sydney samples, suggesting that it may be a critical contributor to drink-driving behaviour.

Study 2 results for drink-driving also indicate that lower perceived likelihood that negative events (unrelated to driving) will happen to them (compared peers of the same age and gender) was associated with more frequent drink-driving behaviour. Further, results suggest that higher endorsement of the costs associated with not drink-driving (such as having to plan a night out in advance and having to limit the amount of drinks consumed) was associated with more frequent drink-driving behaviour.

In Study 1, **driving while fatigued** was predicted by time urgency, specific perceived susceptibility, as well as perceived benefits and perceived costs associated with not driving while fatigued. For Study 2, only perceived benefits of not driving while fatigued significantly predicted the behaviour. This suggests that lower endorsement of the benefits of taking a break while driving to avoid the effects of fatigue (such as comfort or security and being refreshed for the drive ahead) was associated with more frequent driving while fatigued behaviour. Perceived benefits were predictive of driving while fatigued in both Study 1 student and metropolitan

Sydney samples, suggesting that it may be a critical contributor to driving while fatigued behaviour. The strength of perceived benefits as an influential factor for driving while fatigued may be due to recent road safety advertising campaigns that have encouraged drivers to take breaks when driving for long hours and distances (such as the "Stop-Revive-Survive" campaign) in relation to driving while fatigued.

In Study 1, general perceived susceptibility was the only significant predictor of **not wearing seat belt** behaviour. For Study 2, however, not wearing a seat belt was significantly predicted by road-related specific illusory invulnerability and perceived costs of wearing a seat belt. Given that there was no overlap of Study 1 and Study 2 predictors, there are no universally useful predictors for not wearing seat belts. Study 2 results suggests that lower perceived likelihood that negative events *specifically related to wearing a seat belt* will happen to them (compared peers of the same age and gender) is associated with less frequent seat belt use. In addition, Study 2 results suggest that lower endorsement of the perceived costs of wearing a seat belt (such as feelings of discomfort and lack of freedom to move around in the seat) is associated with more frequent seat belt use.

Comparison of Metropolitan Sydney and Rural NSW Samples

In comparing predictors (for metropolitan Sydney versus rural NSW samples), Study 2 results demonstrated different patterns of predictors for all four risky driving behaviours, supporting research suggesting that the factors involved in risky driving may be considerably different urban and rural driving environments (Khorashadi et al., 2005; Dunsire & Baldwin, 1999; Lin et al., 2004; Job, 1999).

In the metropolitan Sydney sample, **speeding** was significantly predicted by authority rebellion, driver anger, road-unrelated illusory invulnerability, as well as the perceived costs and perceived benefits of not speeding. In the rural NSW population, however, speeding behaviour was significantly predicted by time urgency, sensation seeking, driver anger, road-related general illusory invulnerability, road-related specific illusory invulnerability, general perceived severity, and peer influence. Of all predictors of speeding in Study 2, only driver anger was predictive of

speeding in both the metropolitan Sydney and rural NSW samples. Higher anger elicited specifically from driving situations was associated with more frequent speeding behaviour, suggesting that it may be a critical contributor to speeding. This supports past findings illustrating that driver anger may be an influential factor for speeding behaviour (Dahlen et al., 2005; O'Brien et al., 2002; Beirness, 1993; Jonah, 1986).

Results for speeding from the rural NSW sample suggest that lower perceived likelihood that negative events (in general and specifically related to speeding) will happen to them (compared peers of the same age and gender) is associated with more frequent speeding behaviour. Furthermore, lower severity rating for the overall consequences of risky driving was associated with more frequent speeding behaviour. In addition, the association between peer influence and intention to speed suggests that greater peer influence is associated with more frequent speeding behaviour. Finally, results for speeding in the rural NSW sample suggest that higher sensation seeking and time urgency is associated with more frequent speeding behaviour. This supports previous research on risk utility, suggesting that drivers more likely to speed are also more likely to view being on time for appointments as desirable (Adams-Guppy & Guppy, 1995), and are more likely to score highly on relevant measures of sensation seeking (Jonah et al., 2001; Beirness, 1993).

In the metropolitan Sydney sample, **drink-driving** was significantly predicted by road-unrelated illusory invulnerability, peer influence, and the perceived costs of not drink-driving. In the rural NSW population, however, drink-driving behaviour was significantly predicted by driver anger, road-related specific illusory invulnerability, specific perceived susceptibility, and peer influence. The association between peer influence and intention to drink-drive suggests that greater peer influence is associated with more frequent drink-driving behaviour for this rural NSW sample. Peer influence was predictive of drink-driving in all three population samples under investigation, suggesting that it may be a critical contributor to drink-driving behaviour.

Results for drink-driving from the rural NSW sample suggest that lower perceived likelihood that negative events (specifically related to drink-driving) will happen to them (compared peers of the same age and gender) is associated with more frequent drink-driving behaviour. In

addition, lower perceived likelihood of having a crash, being fined, or incurring demerit points (specifically for drink-driving) was associated with more frequent drink-driving behaviour. Higher anger elicited specifically from driving situations was also associated with more frequent drink-driving behaviour.

In the metropolitan Sydney sample, **driving while fatigued** was significantly predicted by perceived benefits of not driving while fatigued. In the rural NSW population, however, driving while fatigued was significantly predicted by gender, road-related specific illusory invulnerability, specific perceived susceptibility, and peer influence. Given that there was no overlap of metropolitan Sydney sample and rural NSW sample predictors, there are no universally useful predictors for driving while fatigued.

Results for driving while fatigued in the rural NSW sample suggest that lower perceived likelihood of having a crash, being fined, or incurring demerit points (specifically for driving while fatigued) was associated with more frequent driving while fatigued behaviour. Furthermore, lower perceived likelihood that negative events (specifically related to driving while fatigued) will happen to them (compared peers of the same age and gender) was associated with more frequent driving while fatigued behaviour. In addition, the association between peer influence and intention to drive while fatigued suggests that greater peer influence is associated with more frequent driving while fatigued behaviour. Gender was also a significant predictor of driving while fatigued, supporting research illustrating the over-representation of male drivers in fatigue-related road crashes (Fell & Black, 1997; Horne & Reyner, 1995; Pack, Pack, Rodgman, Cucchiara, Dinges & Schwab, 1995). Interestingly, though, gender failed to significantly predict other risky driving behaviours in the rural NSW sample – despite research suggesting that gender also influences these risky driving behaviours (Jonah, 1986; Job, 1999; Prabhakar et al., 1996). Clearly, further research is needed to clarify this finding.

In the metropolitan Sydney population, not wearing seat belts was significantly predicted by perceived costs associated with wearing a seat belt and road-related specific illusory invulnerability. In the rural NSW population, however, **not wearing seat belt** behaviour was significantly predicted by authority rebellion, sensation seeking, driver anger, road-unrelated

illusory invulnerability, specific perceived severity, and perceived benefits of wearing a seat belt. Given that there was no overlap of metropolitan Sydney sample and rural NSW sample predictors, there are no universally useful predictors for not wearing seat belts.

Results for seat belt use in the rural NSW sample suggest that higher sensation seeking, higher rebellion against authority figures, and higher anger elicited specifically from driving situations, is associated with less frequent seat belt use. Furthermore, lower perceived likelihood that negative events (unrelated to driving) will happen to them (compared peers of the same age and gender) was associated with less frequent seat belt use. In addition, results suggest that higher endorsement of the perceived benefits of wearing a seat belt (such as feelings of comfort and security) is associated with more frequent seat belt use. Finally, higher severity rating for the specific consequences of not wearing a seat belt was associated with more frequent seat belt use. The strength of perceived severity as an influential factor for seat belt use may be due to recent road safety advertising campaigns that have emphasized the negative impact of not wearing a seat belt on road crashes.

Comments on individual predictors

With regard to individual predictors, for both metropolitan Sydney and rural NSW samples, Study 2 findings are theoretically interesting. For example, in Study 1, illusory vulnerability significantly predicted only one of the four risky driving behaviours under examination. For Study 2, illusory invulnerability scales significantly predicted three of the four risky driving behaviours in the metropolitan Sydney sample, and all four behaviours in the rural NSW sample, supporting literature suggesting illusory invulnerability as a major determinant of risky driving (e.g. Lee et al., 1993; Job, 1990a; 1990b; 1999).

Supporting Study 1 findings, specific attitude and belief factors appear to be strong predictors of risky driving, in both metropolitan Sydney and rural NSW samples. Furthermore, in the metropolitan Sydney sample, personality factors predicted only one of the four risky driving behaviours, supporting Study 1 results suggesting that personality factors may not be as relevant as specific attitudes and beliefs to risky driving. On the other hand, in the rural NSW sample,

personality factors significantly predicted three of the four risky driving behaviours, suggesting that (in particular) driver anger and sensation seeking may be relevant to young drivers in rural NSW regions.

CHAPTER FIVE

STUDY 3: RISKY DRIVING QUESTIONNAIRE RELIABILITY, AND VALIDATION OF THE USE OF THE RISKY DRIVING QUESTIONNAIRE WITH THE USE OF THE IMPLICIT ASSOCIATION TASK

The dependence on self-report measures to provide information about attitudes is a limitation of current research in this area, especially given the social stigma attached to behaviours such as speeding and drink-driving. Study 3 aimed to redress this issue. The Implicit Association Task (IAT) allows the measurement of attitudes in a way that does not rely on self-report.

Table 40 presents a schematic illustration of all five stages in the speeding-related IAT. To summarise, the IAT measures differential associations of two target concepts with evaluations in a way that it is not obvious to participants that attitudes are being assessed at all. The two concepts appear in an initial discrimination task (e.g. speeding versus safe driving words), and the evaluation in a secondary discrimination task (e.g. positive versus negative words for an evaluation attribute). Discriminations for a combination task of concept and evaluation words should be faster when highly compatible categories (e.g. speeding + negative) share a response key, than when less compatible categories (e.g. safe driving + negative) share a response key. This performance difference implicitly measures differential association of the two concepts with the evaluation (Greenwald et al., 1998), and thus attitudes. Please see http://www.projectimplicit.net/ for further information regarding the IAT procedure.

Table 40: Schematic illustration of the "compatible combinations before non-compatible" speeding-related IAT (template employed from Greenwald et al., 1998). Categories for all discriminations are assigned to a left or right response, indicated by the black circles on the third row. The figure employs stimuli from the "speeding-related" IAT, with correct responses indicated as open circles. Target-concept words are presented in upper case, while evaluation words are presented in lower case. For the "non-compatible combinations before compatible" speeding-related IAT, Stages 1 & 3 will be swapped with Stages 4 & 5, respectively.

Sequence	**1**	**2**	**3**	**4**	**5**
Task Description	*Initial Concept Discrimination Task*	*Evaluation Discrimination Task*	*Initial Combined Task*	*Reversed Concept Discrimination Task*	*Reversed Combined Task*
Task Instructions	● **SPEED** **SAFE** ●	● **bad** **good** ●	● **SPEED** ● **bad** **SAFE** ● **good** ●	**SPEED** ● ● **SAFE**	**SPEED** ● ● **bad** ● **SAFE** **good** ●
Sample Stimuli	o FAST SLOW o o SPEED o RACE BRAKE o SAFE o	peace o love o o hatred o agony happy o o nasty	o hatred SLOW o o FAST love o peace o o SPEED	SPEED o FAST o o SLOW RACE o o BRAKE o SAFE	love o peace o o SLOW FAST o SPEED o o hatred

Study 3 introduced four risky driving-related versions of the IAT versions to the field of road safety. It is expected that risky driving concepts are compatible with negative evaluation (and incompatible with positive evaluation), and that safe driving concepts are compatible with positive evaluation (and incompatible with negative evaluation). Study 3 will examine the relationship between IAT-measured implicit attitudes and self-report attitudes examined in Studies 1 and 2. Further, Study 3 aimed to validate the attitudinal scales within the Risky Driving Questionnaire with the use of the IAT. Study 3 also examined the relationship between the IAT-measured attitudes and behavioural intentions, for each of the four risky driving behaviours. Additionally, Study 3 examined the test-retest reliability of the Risky Driving Questionnaire.

Methods

Participants and sampling

Participants were 135 drivers from metropolitan Sydney who were required to hold a current NSW drivers license. All participants (age range of 17-26 years) had previously participated in Study 2 (as part of the metropolitan Sydney sample) and had given consent to be contacted via

telephone regarding participation in a follow-up study. Of the 212 people that researchers attempted to contact, 18 people were unable to be contacted, and 59 people did not wish to participate.

The sample for speeding behaviour included 38 participants (42.1% females; mean age = 21.3; SD age = 2.68). The sample for drink-driving behaviour included 33 participants (42.4% females; mean age = 21.4; SD age = 2.50). The sample for driving while fatigued behaviour included 32 participants (62.5% females; mean age = 21.3; SD age = 2.61). The sample for not wearing seat belts behaviour included 32 participants (68.8% females; mean age = 20.8; SD age = 2.46).

Materials

Participant Information Sheet

The Participant Information Sheet was the same as in Studies 1 and 2.

Consent Form

The Consent Form was the same as in Studies 1 and 2.

Revocation of Consent Form

The Revocation of Consent Form was the same as in Studies 1 and 2.

Risky Driving Questionnaire

The Risky Driving Questionnaire versions were the same as in Study 2.

Implicit Association Task

Two forms of the IAT were formulated for each of the four risky driving behaviours: one with compatible combinations tested before non-compatible ones, and the other with non-compatible combinations tested before compatible ones. This was undertaken in order to assess compatibility-order effects, which have been consistently shown to significantly influence IAT data. Therefore, a total of 8 IAT versions were formulated for the present study.

Table 41 displays all stimulus word lists employed throughout all IAT versions in Study 3. 14 *evaluation* words (seven "good/pleasant-meaning" words and seven "bad/unpleasant-meaning" words), remained the same for each IAT. 14 *target-concept discrimination* words were chosen for each IAT, and related specifically to a given behaviour (a total of 56 *target-concept discrimination* words). For example, for the IAT relating to speeding behaviour, there were seven "speeding/risky driving" words and seven "sticking to speed limits/safe driving" words. All words were selected by the researchers, and judged to be both familiar to and unambiguously classifiable by potential participants. A computer program was designed to present the IAT as described in the "Procedure" section. All words were presented on a computer in blue letters against the white screen background, vertically and horizontally centred in the display.

Table 41: Stimulus word lists for each word category employed throughout all IAT versions in Study 3.

CATEGORY	WORD LIST
EVALUATION WORDS	
"Good"	Paradise, peace, love, wonderful, glorious, laughter, happy
"Bad"	Grief, poison, disaster, hatred, agony, nasty, evil
TARGET-CONCEPT DISCRIMINATION WORDS	
Speeding	
"Speeding / Risky Driving"	Fast, speed, race, rush, zoom, accelerate, blast
"Keeping to Speed Limits / Safe Driving"	Slow, careful, cautious, safe, decelerate, brake, sensible
Drink-Driving	
"Drink-Driving / Risky	Alcohol, drunk, drink-driving, intoxicated,

Driving"	over-the-limit, irresponsible, dangerous
"Not Drink-Driving / Safe Driving"	Responsible, sober, safe, careful, sensible, cautious, under-the-limit
Driving While Fatigued	
"Driving While Fatigued / Risky Driving"	Drowsy, tired, sleepy, unsafe, fatigue, yawning, dangerous
"Not Driving While Fatigued / Safe Driving"	Awake, alert, safe, aware, cautious, sensible, responsible
Not Wearing Seat Belts	
"Not Wearing Seat Belts / Risky Driving"	Not secured, unbelted, unfastened, reckless, unsafe, irresponsible, dangerous
"Wearing Seat Belts / Safe Driving"	Strapped, fastened, safe, secure, responsible, cautious, careful

Apparatus

Laptop computer

All IAT testing was administered on a Hewlett-Packard Pavilion ze4300 laptop computer. Participants gave left responses using the "E" key and right responses using the "I" key.

Procedure

Ethics approval was granted by the University of Sydney Ethics Committee, and ratified by the University of New South Wales Ethics Committee. All Study 2 participants from the metropolitan Sydney sample who had given their telephone numbers (indicating potential interest in a follow-up study) were called, and asked to participate in a follow-up study on "drivers' attitudes toward various risky driving behaviours" being conducted by researchers from the NSW Injury Risk Management Research Centre at the University of New South Wales and the Motor Accidents Authority. Potential participants were told the nature of the follow-up study (involving completion of a short questionnaire, taking approximately 10 minutes, and a reaction

time computer task, taking approximately 15 minutes), and were told that they would receive $20 reimbursement for their participation. People interested in participating were asked for their home address or the address of a nearby library where data could be collected. A meeting time was arranged with each participant.

At the meeting, participants were assured that their involvement was entirely voluntary, that they could withdraw at any time, and that their responses would be confidential. All participants read the Participant Information Sheet, and were instructed to read all questions carefully and to answer each question as honestly as possible. Upon questionnaire completion, researchers checked returned questionnaires immediately to ensure that all sections had been completed. Participants were encouraged to complete any remaining sections.

Participants were told that the next task was a reaction time task, involving five separate classification blocks. Each classification block comprised 28 word trials, as well as 14 practice trials. Participants were told that, overall, there were four categories of words, and were shown the four category labels, as well as the list of words in each category, on the computer screen. Participants were told that, for each classification block, two category labels (for example, "Good" and "Bad") would be present at the top of the screen (one on the top left, and the other on the top right), and the words in these categories would appear on the centre of the screen in front of them (presented individually).

Each classification block started with instructions that described the category discrimination(s) for the block. Participants were instructed to classify each word that appeared into one of the two categories, by pressing the "E" key (a left forefinger response) if the word belonged in the top-left category, and by pressing the "I" key (a right forefinger response) if the word belonged in the top-right category. The participant's key press response initiated a 250 ms delay before the next word trial. Words remained on screen until the participant responded. Participants were instructed to make responses as fast as possible, and were told that mistakes were of no consequence or concern to the researchers, but that a red "X" would appear in the centre of the screen if a mistake was made. After any incorrect response, an "X" immediately replaced the stimulus for 300 ms, lengthening the inter-trial interval by 300 ms. Words were selected

randomly and without replacement (independently for each participant) until the available stimuli for a block were exhausted, at which point the stimulus pool was replaced if more word trials were needed.

It was reiterated to participants that there would be five stages of discriminations to be made, with different categories (and consequently, different words) appearing in each stage. Participants were told that later stages may involve discriminations based on a combination of categories (for example, "Speeding" or "Good" on the top left, and "Safe driving" or "Bad" on the top right). Participants were instructed to read all instructions carefully before commencing, were told that the initial computer display would simply disappear upon completion of the last stage, indicating overall task completion. Reaction times for each word trial in all classification blocks were recorded.

In order to examine compatibility-order effects, the two versions of each IAT were interchanged, such that the first participant received the "compatible combinations before non-compatible" version, the second participant received the "non-compatible combinations before compatible" version, and so on. (Risky driving and negative evaluation/safe driving and positive evaluation were defined as *compatible combinations*, while safe driving and negative evaluation/risky driving and positive evaluation were defined as *non-compatible combinations*).

Participants were given 30 minutes to complete the questionnaire and the IAT (in that order). Upon completion, all participants were debriefed and thanked for their participation. Each participant was given $20 as reimbursement for their time.

Statistical Analyses

Data Analyses

Data were analysed employing SPSS and Microsoft Excel. A Type 1 error rate of 0.05 was employed for all analyses, and all tests were 2-tailed.

Risky Driving Questionnaire test-retest reliability

Scale construction was undertaken as in Study 2. For each of the four risky driving behaviours (for each attitudinal, personality and behavioural intention scale), test-retest reliability of the Risky Driving Questionnaire was assessed by computing Pearson's correlation coefficients, between each scale constructed in Study 3 and the corresponding scale constructed in the Study 2 metropolitan Sydney sample.

Implicit Association Task

All practice trials and uncombined classification blocks were disregarded for analysis prior to conducting other analyses. For both combined classification blocks, the distribution of reaction times was examined for each participant, revealing a small proportion of extremely fast and extremely slow responses. These outlying values typically indicate, respectively, anticipated responses and momentary inattention. These values are problematic, not only because they lack theoretical interest, but also because they distort means and inflate variances. As such, in accordance with original IAT methodology (Greenwald et al., 1998), all latency values below 300 ms were recoded to 300 ms, and all latency values above 3000 ms were recoded to 3000 ms. Log-transformations were then conducted for all latencies. Average latencies for the two combined IAT classification blocks were then computed for each participant, and the statistical difference between these means was assessed by computing paired t-tests for all four behaviours. IAT effects for each of the four behaviours were then calculated by computing the difference between mean latencies for the two combined stages (non-compatible – compatible). Compatibility order effects were assessed by computing one-way ANOVAs for all four behaviours.

Relationship between IAT and self-report measures

The IAT developed here[12] can only be employed to assess the concurrent validity of self-reported attitudes (i.e. evaluative beliefs) because the IAT measures the association between the risky/safe behaviour concept and an evaluation. Consequently, self-reported evaluative attitude scales from the Risky Driving Questionnaire were identified prior to Study 3 data analyses. Only

[12] It is possible to replace the evaluation concept with other concepts (e.g. severity) for the formulation of an IAT.

peer influence represented an evaluative attitude scale. However, the IAT developed here can be employed to assess the predictive validity of self-reported variables which might be associated with evaluative attitudes. Thus, the specific perceived susceptibility, specific perceived severity, perceived costs, perceived benefits and peer influence scales, were correlated with IAT effect, for each of the four behaviours. For each of the four risky driving behaviours, the relationship between the IAT effect and behavioural intentions was assessed by employing Pearson's correlation coefficients.

Results

Scale Construction

Complete scale construction data analyses for all Risky Driving Questionnaire scales in Study 3 are reproduced in Appendix H.

Risky Driving Questionnaire Test-Retest Reliability

Table 42 shows correlations between each scale constructed in Study 3 and the corresponding scale constructed in Study 2, for each attitudinal, personality and behavioural intention scale, presented separately for each questionnaire version. Test-retest correlation coefficients were satisfactory for most scales constructed.

Table 42: Test-retest correlations between each scale constructed in Study 3 and the corresponding scale constructed in the Study 2, for each attitudinal, personality and behavioural intention scale, presented separately for each questionnaire version.[13]

Scale	"Speeding" version	"Drink-driving"	"Driving while fatigued"	"Not wearing seat belts"

[13] Authority-rebellion, time urgency, sensation seeking, driver anger, road-unrelated illusory invulnerability, road-related general illusory invulnerability, general perceived severity, and general perceived susceptibility questions were the same for all behaviours. Different correlation values reflect the fact that different participants completed different questionnaire versions.

		version	**version**	**version**
Authority-Rebellion personality scale	0.62**	0.64**	0.79**	0.73**
Time Urgency personality scale	0.37*	0.14	0.64**	0.60**
Sensation Seeking personality scale	0.82**	0.82**	0.85**	0.74**
Driver Anger personality scale	0.42**	0.51**	0.52**	0.55**
Behavioural Intention	0.58**	0.78**	0.86**	0.92**
Road-Unrelated Illusory Invulnerability	0.62**	0.78**	0.46**	0.59**
Road-Related General Illusory Invulnerability	0.43**	0.19	0.25	0.10
Road-Related Specific Illusory Invulnerability	0.33*	0.45**	0.66**	0.24
Specific Perceived Severity	0.61**	0.29	0.49**	0.69**
General Perceived Severity	0.89**	0.88**	0.74**	0.75**
General Perceived Susceptibility	0.55**	0.60**	0.57**	0.49**
Specific Perceived Susceptibility	0.47**	0.34	0.39*	0.68**
Perceived Costs	0.67**	0.45**	0.51**	0.70**
Perceived Benefits	0.71**	0.31	0.81**	0.49**
Peer influence	0.72**	0.82**	0.44*	0.51**

** Correlation is significant at the 0.001 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Implicit Association Task

Speeding

For speeding, the IAT effect averaged 307.61 ms when compatible combinations preceded non-compatible combinations, and 338.44 ms when non-compatible combinations were presented first. The effect of compatibility order was not significant (F [1, 36] = 0.126, p=0.724). Consequently, compatibility order was not considered in further analyses. Figure 1 displays the mean latencies for compatible and non-compatible combined IAT classification blocks in Study 3, for speeding. For the compatible combined classification block, mean latency was 657.28 (SD=120.79), and for the non-compatible combined classification block, mean latency was 980.30 (SD=299.05). The mean difference between compatible and non-compatible combined classification blocks was statistically significant (p<.001, t=-7.535, CI: -409.89 - -236.17).

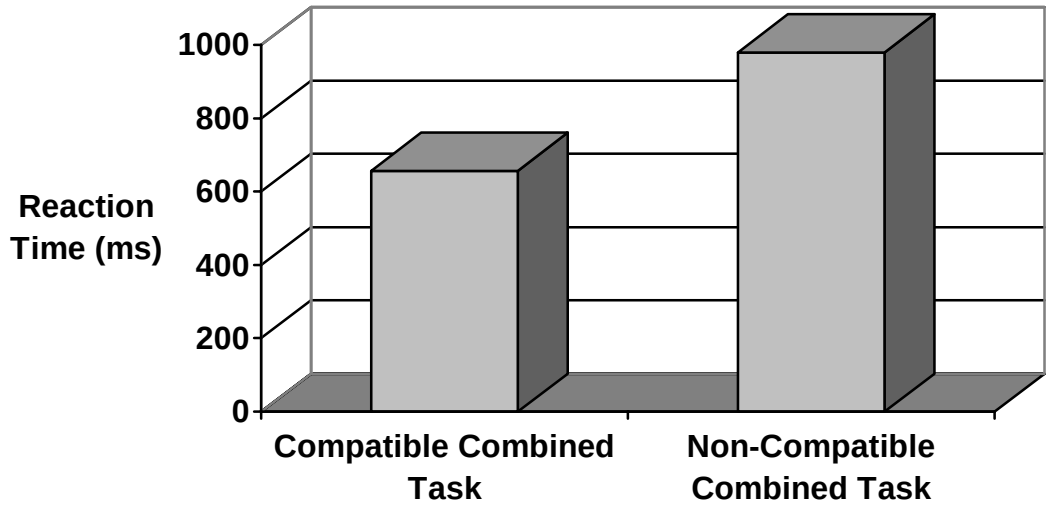

Figure 1: Mean latencies for compatible and non-compatible combined IAT classification blocks in Study 3, for speeding.

Drink-driving

For drink-driving, the IAT effect averaged 332.73 ms when compatible combinations preceded non-compatible combinations, and 258.69 ms when non-compatible combinations were presented first. The effect of compatibility order was not significant (F [1, 31] = 1.059, p=0.312). Consequently, compatibility order was not considered in further analyses. Figure 2 displays the mean latencies for compatible and non-compatible combined IAT classification blocks in Study 3, for drink-driving. For the compatible combined classification block, mean latency was 591.19 (SD=172.91), and for the non-compatible combined classification block, mean latency was

886.91 (SD=267.81). The mean difference between compatible and non-compatible combined classification blocks was statistically significant (p<.001, t=-8.245, CI: -370.16 - -223.50).

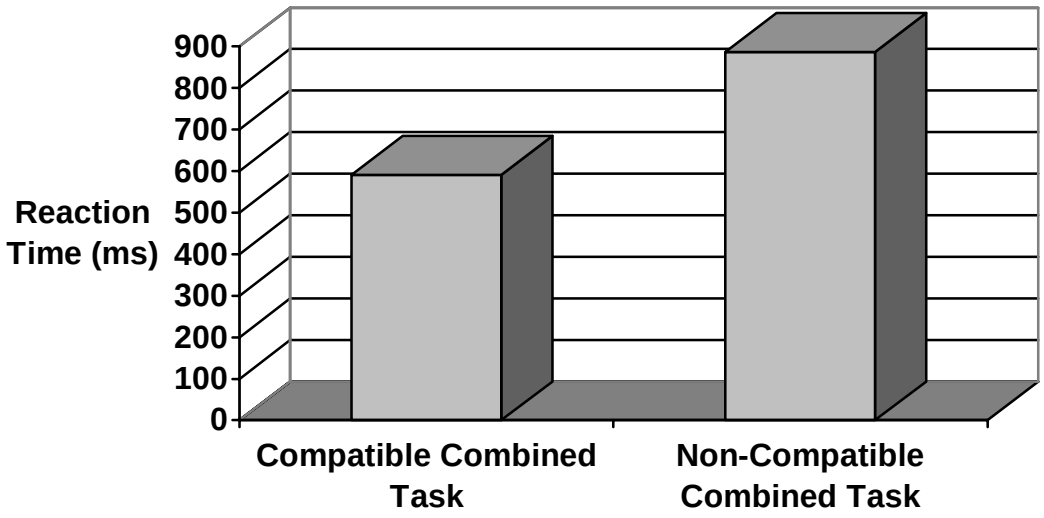

Figure 2: Mean latencies for compatible and non-compatible combined IAT classification blocks in Study 3, for drink-driving.

Driving while fatigued

For driving while fatigued, the IAT effect averaged 523.78 ms when compatible combinations preceded non-compatible combinations, and 471.42 ms when non-compatible combinations were presented first. The effect of compatibility order was not significant (F [1, 30] = 0.323, p=0.574). Consequently, compatibility order was not considered in further analyses. Figure 3 displays the mean latencies for compatible and non-compatible combined IAT classification blocks in Study 3, for driving while fatigued. For the compatible combined classification block, mean latency was 586.55 (SD=136.78), and for the non-compatible combined classification block, mean latency was 1084.15 (SD=328.14). The mean difference between compatible and non-compatible combined classification blocks was statistically significant (p<.001, t=-10.926, CI: -590.49 - -404.72).

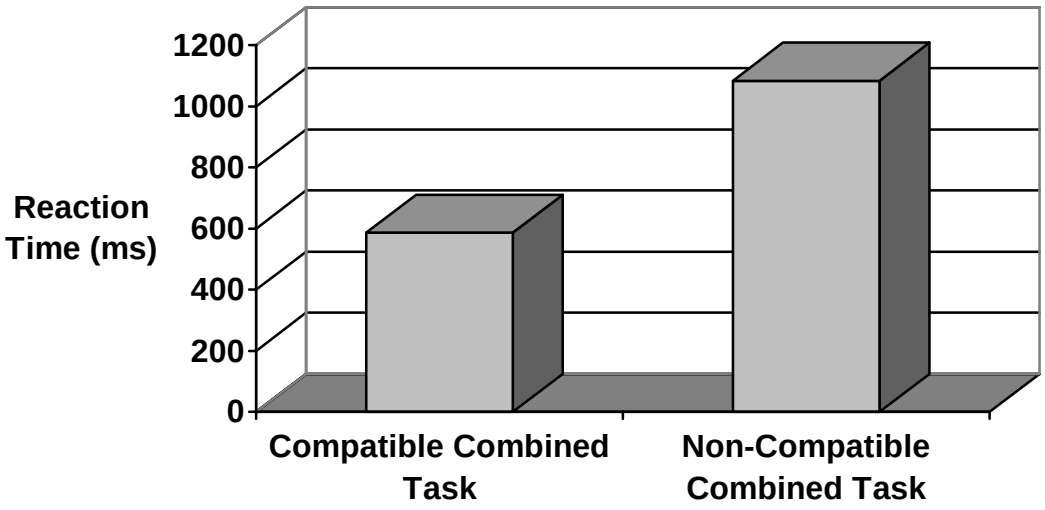

Figure 3: Mean latencies for compatible and non-compatible combined IAT classification blocks in Study 3, for driving while fatigued.

Not wearing seat belts

For not wearing seat belts, the IAT effect averaged 455.52 ms when compatible combinations preceded non-compatible combinations, and 451.79 ms when non-compatible combinations were presented first. The effect of compatibility order was not significant (F [1, 30] = 0.003, p=0.957). Consequently, compatibility order was not considered in further analyses. Figure 4 displays the mean latencies for compatible and non-compatible combined IAT classification blocks in Study 3, for not wearing seat belts. For the compatible combined classification block, mean latency was 561.81 (SD=111.19), and for the non-compatible combined classification block, mean latency was 1015.47 (SD=262.45). The mean difference between compatible and non-compatible combined classification blocks was statistically significant (p<.001, t=-13.340, CI: -523.01 - -384.30).

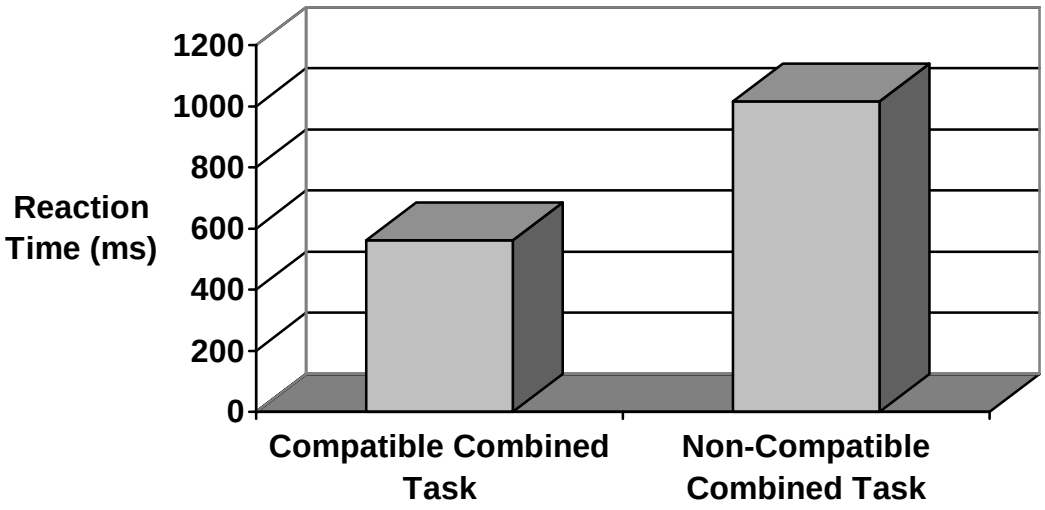

Figure 4: Mean latencies for compatible and non-compatible combined IAT classification blocks in Study 3, for not wearing seat belts.

Correlations between IAT Effect and explicit attitudinal scales

Table 43 shows Pearson's correlations between the IAT effect and peer influence, specific perceived susceptibility, specific perceived severity, perceived costs, perceived benefits, and behavioural intention scales of the Risky Driving Questionnaire, presented separately for each questionnaire version. The IAT effect exhibited low correlations with most scales, except for the perceived benefits of wearing a seat belt, specific perceived susceptibility for driving while fatigued, specific perceived severity for driving while fatigued, and peer influence for driving while fatigued. The IAT effect exhibited a significant correlation with behavioural intentions for drink-driving, but low correlations with the behavioural intentions for the other three behaviours.

Table 43: Pearson's correlations between the IAT effect and peer influence, specific perceived susceptibility, specific perceived severity, perceived costs, perceived benefits, and behavioural intention scales of the Risky Driving Questionnaire, presented separately for each questionnaire version.

Risky Driving	"Speeding" version	"Drink-driving"	"Driving while fatigued"	"Not wearing seat belts"

Questionnaire Scale		version	version	version
Peer influence	-0.04	0.14	0.42*	-0.04
Specific Perceived Susceptibility	0.17	-0.07	-0.41*	-0.17
Specific Perceived Severity	0.10	0.24	-0.36*	-0.03
Perceived Costs	0.01	-0.01	0.20	-0.16
Perceived Benefits	0.17	0.13	0.02	-0.43*
r (IAT Effect x Behavioural Intention)	-0.10	0.44*	0.10	-0.11

* Correlation is significant at the 0.05 level (2-tailed).

Discussion

IAT results demonstrate generally negative attitudes for risky driving behaviours, and some evidence of concurrent and predictive validity of self-report scales. Results also indicate that the Risky Driving Questionnaire is a stable self-report instrument.

Reliability of the Risky Driving Questionnaire

The stability of the Risky Driving Questionnaire was assessed by computing test-retest correlations between each scale constructed in Study 3 and the corresponding scale constructed in Study 2, for each attitudinal, personality and behavioural intention scale (separately for each of the four risky driving behaviours). Pearson's correlation coefficients were satisfactory for most scales constructed, for each of the four behaviours. Poor test-retest correlations were exhibited only for road-related general illusory invulnerability, where a statistically significant correlation was observed for the "speeding" version only. A range of factors may influence illusory invulnerability, including personal experience. At a time when young drivers are rapidly gaining new driving experiences, road-related illusory invulnerability may be particularly volatile. Overall, results suggest that all four versions of the Risky Driving Questionnaire are

stable self-report instruments for measuring the attitudes, beliefs and behavioural intentions of young drivers.

The use of the Implicit Association Task

Study 3 introduced specific driving-related IAT versions (with one driving version developed for each of the four risky driving behaviours) to the field of road safety. Confirming expectation, consistently faster IAT performance was observed when associatively compatible categories (rather than associatively non-compatible categories) shared the same response. For example, for the speeding version, discriminations were performed more rapidly when the evaluatively positive category (safe-driving) shared a response key with positive-meaning words (compared to when this category shared a response with negative-meaning words), and when the evaluatively negative category (speeding) shared a response key with negative-meaning words (compared to when this category shared a response with positive-meaning words). Positive IAT effects were observed for each of the four risky driving behaviours. Results illustrate that the IAT is sensitive to evaluative discriminations, suggesting that the IAT method may be effectively employed to measure implicit attitudes.

It might be argued that several of the concept words employed in the IAT task are associated with some evaluation words outside of the driving context, such that the IAT reflects this association rather than a driving-specific attitude. For example, “safe” may have a positive connotation which is independent of driving. We included concept words such as “safe”, “sensible”, “dangerous” and “reckless” because it is difficult to identify sufficient clearly driving-related words for the IAT procedure. We hoped that because these words were identified in instructions as driving-related, and because they were included in lists of more clearly driving-related words (e.g. speed, race), it was the driving-related meaning that participants thought of when they performed the task. If the more general meanings were considered, then we think it is not unreasonable to assume that a positive connotation of “safe” would extend to a positive connotation of “safe driving”.

For each of the four behaviours, the effect of compatibility order was not statistically significant, replicating findings by Greenwald et al. (1998) suggesting that compatibility order does not appear to undermine IAT sensitivity in measuring implicit attitudes.

In order to examine the validity of self-reported attitudes, the relationship between implicit attitudes (as measured by the IAT) and explicit attitudes (as measured by the Risky Driving Questionnaire) was assessed, for each of the four risky driving behaviours. For driving while fatigued, IAT effect correlated significantly with specific perceived susceptibility, specific perceived severity and peer influence, suggesting that higher negative implicit attitude to driving while fatigued (indicated by a higher IAT effect) is significantly related to a greater influence of driving while fatigued from friends, as well as higher perceived susceptibility to, and severity of, the consequences of driving while fatigued. For the other three behaviours, a significant correlation was observed between IAT effect and perceived benefits of wearing a seat belt, suggesting that higher positive implicit attitude to seat belt use (indicated by a higher IAT effect) is significantly related to a higher perceived benefit of seat belt use. A further significant correlation was observed between IAT effect and behavioural intentions to drink-drive, suggesting that higher negative implicit attitude to drink-driving (indicated by a higher IAT effect) is significantly related to greater intention to engage in drink-driving behaviour.

Thus, Study 3 results do not illustrate a consistent relationship between the IAT-measured implicit attitudes and Risky Driving Questionnaire self-report measures. Observed correlations with the IAT effect for driving while fatigued were consistent with predictions that might have been made assuming predictive validity of the self-report measures and an association between attitudes and perceived risks. However, the other observed correlations were contrary to prediction, and relatively few correlations were observed.

There may be several reasons why more predictable correlations were not demonstrated between the IAT and self-report measures.

1. The IAT may be invalid. However, the IAT has consistently been found to be a valid measure of attitudes in a number of other areas.

2. The Risky Driving Questionnaire may be invalid. Self-report attitude measures may be influenced by socially desirable responding, which has been a cause for concern in the measurement of self-reported road safety beliefs, attitudes and risky driving (Lajunen et al., 1997; Lajunen & Summala, 2003). However, evidence generally supports the Risky Driving Questionnaire as a reliable self-report instrument for measuring the attitudes, beliefs and behavioural intentions of young drivers
3. The IAT and self-report measures may actually measure slightly different underlying constructs. The IAT is designed to assess pure evaluative judgements, whereas the self-report measures assess factors which may contribute to such judgements.
4. The IAT may not be a sufficiently sensitive measure to demonstrate clear relationships. That is, while self-report measures discriminate between levels of a negative attitude (for example, by employing a Likert scale response format), the IAT demonstrates that a negative attitude exists, but may not clearly discriminate levels of the negative attitude.

Further research is necessary to elucidate the relationship between implicit attitudes, explicit attitudes and behavioural intentions.

CHAPTER SIX

GENERAL DISCUSSION

The present research program focused on three central issues: (1) assessing whether there are different predictors for different risky driving behaviours, (2) investigating the generalizability of student population results to the greater metropolitan Sydney area, and (3) assessing potential urban/rural population differences in the prediction of risky driving behaviour. In addition, the present research examined the use of a Risky Driving Questionnaire (to reliably assess driver attitudes, beliefs, personality factors and behavioural intentions for speeding, drink-driving, driving while fatigued, and not wearing seat belts), as well as the use of the IAT (in validating the use of the Risky Driving Questionnaire, and assessing its relationship with behavioural intentions). For the present discussion, each research issue will be addressed separately, and any practical implications will be considered.

The possibility of different factors predicting different risky driving behaviours

The present research tested the apparent assumption in the field that demographic, personality, and attitudinal factors contribute to risky driving behaviours in the same way, regardless of the behaviour. Results clearly indicate that different factors predict different risky driving behaviours, supporting our preliminary research in this field (Fernandes & Job, 2003; Fernandes et al., 2004). Indeed, despite the differences between all three population samples examined in the present research, they each demonstrated the finding that *different behaviours* seem to have *different predictors*. Motivation to engage in different risk behaviours may vary considerably. These results suggest that the reasons for a driver engaging in one risky driving behaviour may be different from the reasons for engaging in another risky driving behaviour. That is, the factors which contribute to a person's decision to speed, for example, may not be the same factors that contribute to a person's decision to drink-driving.

For all three samples (student population, metropolitan Sydney population, and rural NSW population), at least one factor specific to a particular risky driving significantly predicted that

behaviour (except for not wearing seat belts, in the student sample, which was the only non-significant regression model demonstrated in the present research program). It appears that, for these behaviours, the more approving attitudes people hold (specific to each risky driving behaviour), the more they will engage in that particular behaviour. This finding suggests that specific attitudes are consistent and robust predictors of risky driving, and supports recent research illustrating the importance of investigating those attitudes and beliefs specific to individual risky driving behaviours, rather than *general* road safety attitudes and beliefs (Fernandes & Job, 2003; Fernandes et al., 2004; Iversen, 2004). Sutton (1998) argues that a general attitude measure is a weak predictor of a specific behaviour, implying that the investigation of attitudes and beliefs specific to individual driving behaviours (rather than a general measure) would allow for the reliable prediction of those specific behaviours.

Driver attitudes and beliefs examined in the present research were based on the Health Belief Model and aspects of the Theory of Planned Behaviour. Results suggest that this model provides a sound theoretical framework for the investigation of risky driving behaviour. However, for all studies, the proportion of variance accounted for by each hierarchical regression model did not exceed 76.0% for any of the four behaviours, suggesting that the theoretical framework employed in the present research may be too simplistic, and may not fully explain the complex, and possibly interactive, nature of risk driving.

The finding that different factors predict different behaviours suggests the need for research specifically focused on individual driving behaviours. The present research represents a starting point to this requirement. Furthermore, present findings clearly indicate the importance of considering underlying mechanisms for individual risky driving behaviour when designing relevant countermeasures. We cannot extrapolate from one risky driving behaviour to another. As such, each behaviour should be investigated individually in search of different causal factors.

Speeding

Table 44 lists the statistically significant predictors of speeding behaviour, and the population samples in which each predictor was found to be significant. Results show that, overall, speeding

was significantly predicted by: gender, driver anger, sensation seeking, authority rebellion, time urgency, road-unrelated illusory invulnerability, road-related general illusory invulnerability, road-related specific illusory invulnerability, general perceived susceptibility, specific perceived susceptibility, perceived costs of not speeding, and peer influence.

Table 44: The statistically significant predictors of speeding behaviour (pooled for each of the three population samples examined in the present study), and the population samples for which each predictor was found to be significant.

Statistically Significant Predictor	**Sample for which is was Statistically Significant**
Driver Anger personality	Student sample, Metropolitan Sydney sample, Rural NSW sample
Sensation Seeking personality	Student sample, Metropolitan Sydney sample
General Perceived Susceptibility	Student sample, Metropolitan Sydney sample
Road-Unrelated Illusory Invulnerability	Student sample, Rural NSW sample
Gender	Student sample
Specific Perceived Susceptibility	Student sample
Time Urgency personality	Metropolitan Sydney sample
Road-Related General Illusory Invulnerability	Metropolitan Sydney sample
Road-Related Specific Illusory Invulnerability	Metropolitan Sydney sample
Peer influence	Metropolitan Sydney sample
Authority-Rebellion personality	Rural NSW sample
Perceived Costs	Rural NSW sample
Perceived Benefits	Rural NSW sample

Of these predictors, driver anger appears to be the most pertinent predictor of speeding behaviour in the present research, given that it was shown to significantly predict speeding in all three population samples examined. These results suggest that higher anger elicited specifically from driving situations is associated with more frequent speeding behaviour, and support previous

research advocating the importance of anger in contributing to speeding behaviour (O'Brien et al., 2002). Furthermore, given that people may engage in risky driving practices as a means of addressing their anger (Jonah, 1986; Arnett et al., 1997; Jonah et al., 2001), results suggest that future road safety policies and advertisement campaigns for speeding should focus on initiatives to reduce the incidence of drivers engaging in speeding in order to "let off steam". This may extend to improving the road environment in order to increase traffic flow and reduce traveling time, and thus potentially reducing on-road anger.

Sensation seeking also appears particularly relevant to speeding behaviour, given that it was shown to significantly predict speeding in the student and metropolitan Sydney population samples examined in this research. Sensation seeking is a trait describing the tendency to seek new, different, and intense sensations and experiences (Zuckerman, 1994). These results suggest that higher desire to experience new sensations is associated with more frequent speeding behaviour, and is consistent with previous research consistently identifying sensation seeking as a prominent factor associated with risky driving behaviour (Beirness, 1993; Dahlen et al., 2005; Horvath & Zuckerman, 1993; Zuckerman, 1994), and in particular, illustrating that high sensation seekers are more likely to engage in speeding behaviour (Jonah et al., 2001; Beirness & Simpson, 1988). Sensation seeking appears particularly relevant to speeding because of the feelings associated with engaging in the behaviour (Jonah, 1997). This suggests that future road safety policy and campaigns for speeding should focus on reducing the practice of speeding as a means of experiencing a "thrill" or a "rush". This may extend to the formulation of road safety campaigns that promote driving as, primarily, a mode of transport, and that challenge the perceived utility of speeding as fun. Vehicle advertisements depicting and promoting speeding as fun and thrilling should be further discouraged.

General perceived susceptibility also appears particularly relevant to speeding behaviour, given that it was shown to significantly predict speeding in the student and metropolitan Sydney population samples. These results suggest that lower perceived likelihood of having a crash, being fined, or incurring demerit points *in general* was associated with more frequent speeding behaviour. Future road advertising campaigns may need to be implemented in coordination with

greater police enforcement throughout metropolitan Sydney in order to effectively reduce speeding behaviour.

Drink-Driving

Table 45 lists the statistically significant predictors of drink-driving behaviour, and the population samples in which each predictor was found to be significant. Results show that, overall, drink-driving was significantly predicted by: driver anger, road-unrelated illusory invulnerability, road-related specific illusory invulnerability, specific perceived susceptibility, perceived costs of not drink-driving, and peer influence.

Table 45: The statistically significant predictors of drink-driving behaviour (pooled for each of the three population samples examined in the present study), and the population samples for which each predictor was found to be significant.

Statistically Significant Predictor	Sample for which is was Statistically Significant
Peer influence	Student sample, Metropolitan Sydney sample, Rural NSW sample
Driver Anger personality	Metropolitan Sydney sample
Specific Perceived Susceptibility	Metropolitan Sydney sample
Road-Related Specific Illusory Invulnerability	Metropolitan Sydney sample
Road-Unrelated Illusory Invulnerability	Rural NSW sample
Perceived Costs	Rural NSW sample

Of these predictors, peer influence appears to be the most pertinent predictor of drink-driving behaviour in the present research, given that it was shown to significantly predict drink-driving in all three population samples examined. The association between peer influence and intention to drink-drive suggests that greater peer influence is associated with more frequent drink-driving behaviour. Peer influence may be particularly relevant to young driver drink-driving given that many circumstances in which young drivers are vulnerable to drink-driving involve social

drinking situations when they are with their friends. The strength of peer influence as an important factor associated with drink-driving may be due to recent road safety advertisement campaigns that have focused on social norms in relation to drink-driving behaviour (e.g. "If you drink and drive, you're a bloody idiot" campaign). Further, the efficacy of random breath testing throughout NSW is thought to be based partly on a shift in social norms (Job et al., 1997). This also supports prior research indicating the importance of social norms to drink-driving (Gulliver & Begg, 2004); given that many circumstances in which young drivers might drink-drive involve social drinking situations when they are with their friends. Present results suggest that future road safety policy for drink-driving may require the inclusion of initiatives related to the social drinking habits of young people. Road safety campaigns should continue to promote negative images of drinking and driving for young people. In addition, road safety campaigns that encourage young drivers to prevent their friends from driving after drinking may effectively reduce drink-driving behaviour.

Driving While Fatigued

Table 46 lists the statistically significant predictors of driving while fatigued behaviour, and the population samples in which each predictor was found to be significant. Results show that, overall, driving while fatigued was significantly predicted by: gender, road-related specific illusory invulnerability, specific perceived susceptibility, perceived costs of not driving while fatigued, perceived benefits of not driving while fatigued, and peer influence.

Table 46: The statistically significant predictors of driving while fatigued behaviour (pooled for each of the three population samples examined in the present study), and the population samples for which each predictor was found to be significant.

Statistically Significant Predictor	Sample for which is was Statistically Significant
Specific Perceived Susceptibility	Student sample, Metropolitan Sydney sample
Perceived Benefits	Student sample, Rural NSW sample
Perceived Costs	Student sample
Gender	Metropolitan Sydney sample

Road-Related Specific Illusory Invulnerability	Metropolitan Sydney sample
Peer influence	Metropolitan Sydney sample

Of these predictors, specific perceived susceptibility appears particularly relevant to driving while fatigued behaviour, given that it was shown to significantly predict driving while fatigued in the student and metropolitan Sydney population samples examined in this research. This suggests that lower perceived likelihood of having a crash, being fined, or incurring demerit points *specifically for driving while fatigued* was associated with more frequent driving while fatigued behaviour. The strength of specific perceived susceptibility as an influential factor for driving while fatigued may be due to recent road safety advertisement campaigns that have emphasized the crash risk of driving while fatigued in terms of sleep deprivation and circadian rhythms. Such campaigns could be strengthened to ensure that young drivers view themselves as susceptible to fatigue-related road crashes.

Perceived benefits of not driving while fatigued also appears relevant to driving while fatigued behaviour, given that it was shown to significantly predict driving while fatigued in the student and rural NSW population samples examined in this research. This suggests that lower endorsement of the benefits of taking a break while driving to avoid the effects of fatigue (such as comfort or security and being refreshed for the upcoming drive) is associated with more frequent driving while fatigued behaviour. The strength of perceived benefits as an influential factor for driving while fatigued may be due to recent road safety advertising campaigns that have encouraged drivers to take breaks when driving for long hours and distances in order to avoid crashing (such as the "Stop-Revive-Survive" campaign). The present results suggest that there should be greater promotion of these campaigns throughout rural NSW areas. Future road safety campaigns might also promote the personal security and comfort associated with taking a break in order to avoid driving while fatigued, if driving while fatigued behaviour is to be effectively addressed.

Not Wearing Seat Belts

Table 47 lists the statistically significant predictors of not wearing seat belt behaviour (pooled for each of the three population samples examined in the present study), and the population samples in which each predictor was found to be significant. Results show that, overall, not wearing seat belts was significantly predicted by: driver anger, sensation seeking, authority rebellion, road-unrelated illusory invulnerability, road-related general illusory invulnerability, road-related specific illusory invulnerability, general perceived susceptibility, specific perceived severity, perceived costs of wearing a seat belt, and perceived benefits of wearing a seat belt.

Table 47: The statistically significant predictors of not wearing seat belts behaviour (pooled for each of the three population samples examined in the present study), and the population samples for which each predictor was found to be significant.

Statistically Significant Predictor	**Sample for which is was Statistically Significant**
General Perceived Susceptibility	Student sample
Road-Related Specific Illusory Invulnerability	Metropolitan Sydney sample
Perceived Costs	Metropolitan Sydney sample
Driver Anger personality	Rural NSW sample
Sensation Seeking personality	Rural NSW sample
Authority-Rebellion personality	Rural NSW sample
Road-Unrelated Illusory Invulnerability	Rural NSW sample
Specific Perceived Severity	Rural NSW sample
Perceived Benefits	Rural NSW sample

All of these factors significantly predicted seat belt use in only one of the three population samples examined in the present study. Given that there was no overlap of predictors, there are no universally useful predictors for not wearing seat belts. Thus, the predictors uncovered for not wearing seat belts may only be particularly relevant to the given population in which they have been examined.

The generalizability of student population results to the general population

A key objective of Study 2 was to investigate whether the results from Study 1 hold in a general population sample. The issue of generalizability is often identified as a concern in research using a first-year psychology student sample. In some cases (e.g. research on basic mental processes), generalization could be expected with reasonable confidence. However, our previous research on risky driving (Fernandes & Job, 2003) suggests that results may not generalize from university students to the general population.

Analysis of the location of Study 1 participants' residence in Sydney showed that 23.4% of participants lived in the lower eastern beaches and eastern suburbs, 20.1% of participants lived in the southern beaches and inner southern suburbs, 14.5% of participants lived in the inner western suburbs, and 12.8% of participants lived in the northern beaches and north shore suburbs. With a total of 70.8% of participants living in these regions, suburbs in the greater western and south-western regions of Sydney were substantially under-represented in the student sample. Furthermore, socioeconomic status may vary more in the general community than in a sample of university students, given that acceptance into university is conditional upon completion of the Higher School Certificate (most measures of socioeconomic status include education level as a critical component). Consequently, to assume generalization to the general population would be foolhardy.

Some results illustrated generalizability from the student sample to the general population sample. In particular, for both student population and metropolitan Sydney samples, peer influence significantly predicted drink-driving behaviour, specific perceived susceptibility significantly predicted driving while fatigued, and sensation seeking, driver anger and general perceived susceptibility significantly predicted speeding behaviour. Results also demonstrated some differences in terms of prediction of risky driving behaviours. For all behaviours, at least one of the predictors found in the student population sample were different to those found in the metropolitan Sydney sample, supporting our previous findings (Fernandes & Job, 2003).

In road safety research and practice, results that apply to the general population (in this case, the young driver population) are usually sought. The present findings illustrate that some of the

predictors uncovered in the student population sample were also found in the metropolitan Sydney sample, suggesting that a student sample gives some indication of the general driving population. Consequently, a student sample may be employed as a convenient sample of the young driver population if required; however, a general population sample would provide an ideal sample of this population. The predictors identified in the student sample may only be useful for university-based road safety campaigns.

Comparison of urban and rural data in the prediction of risky driving behaviour

A key objective of Study 2 was to compare data from the metropolitan Sydney sample with data from a rural NSW sample, particularly by comparing predictors found in the metropolitan Sydney population sample with those found in the rural NSW population sample, for each risky driving behaviour under examination.

Research has illustrated that road crash fatality and injury severity levels may vary significantly between rural and urban locations (Khorashadi et al., 2005; Clark & Cushing, 2004; Lin et al. 2004). The reasons for such differences may relate partly to differences in the demands placed on drivers in rural and urban environments. For example, due to potentially driving greater distances in urban areas (resulting in greater traveling time), the response demands placed on drivers in relation to driver fatigue may be significantly higher in rural areas, compared to urban areas. This, together with different driver populations, roadway design characteristics and traffic conditions (Khorashadi et al., 2005), may all potentially contribute to a difference in risky driving behaviour between rural and urban areas.

Some results illustrate commonality between the metropolitan Sydney and rural NSW samples. In particular, for both metropolitan Sydney and rural NSW samples, driver anger and road-unrelated illusory invulnerability significantly predicted speeding behaviour, peer influence significantly predicted drink-driving behaviour, and perceived benefits significantly predicted driving while fatigued. Results also demonstrated some differences in terms of the prediction of risky driving behaviours. For all behaviours, at least one of the predictors found in the metropolitan Sydney sample were different to those found in the rural NSW sample.

Thus, factors that influence risky driving may be different for each of these driver populations. This suggests that road safety advertisement campaigns may need to be tailored for metropolitan Sydney and rural NSW separately, for each risky driving behaviour. Nonetheless, some of the predictors uncovered in the metropolitan Sydney sample were also found in the rural NSW sample, suggesting that these factors may be useful for broad-based road safety campaigns.

The use of the Risky Driving Questionnaire

All four versions of the Risky Driving Questionnaire appear to be valid and reliable instruments for a university student sample, a metropolitan Sydney sample, and a rural NSW sample. In many instances, the factors found to significantly predict a particular behaviour have supported previous research in the area (such as driver anger and sensation seeking significantly predicting speeding behaviour, and peer influence significantly predicting drink-driving behaviour). Furthermore, test-retest correlations for each attitudinal, personality and behavioural intention scale in the Risky Driving Questionnaire (for each of the four versions) were satisfactory for most scales constructed, for each of the four behaviours.

For all three population samples examined in the present research, internal consistency levels were adequate for most Risky Driving Questionnaire scales constructed. As expected, poor internal consistency levels were observed for scales which were designed to assess levels of a particular dependent variable, without assuming that the dependent variable reflects only one underlying construct (i.e. road-unrelated illusory invulnerability, road-related general illusory invulnerability, perceived severity, perceived susceptibility, perceived benefits, and perceived costs scales). For example, in relation to the specific perceived severity of speeding, someone who has financial difficulties may be more likely to believe that a fine for speeding is extremely severe, while believing the incurring of demerit points is only moderately severe. People may perceive the severity of speeding differently in terms of incurring demerit points, being fined by the police, or having a car crash; but the sum of severities of these outcomes gives a good indication of overall severity. A low Cronbach's Alpha may be expected because these items

may not be measuring one underlying construct. Nonetheless, the sum of scores may remain a valuable overall index of specific perceived severity of speeding.

The stability of the Risky Driving Questionnaire was assessed by computing test-retest correlations between each attitudinal, personality and behavioural intention scale constructed in Study 3 and the corresponding scale constructed in Study 2 (separately for each of the four risky driving behaviours). Test-retest correlations were satisfactory for most scales constructed. Poor test-retest correlations were exhibited only for road-related general illusory invulnerability, where a statistically significant correlation was observed for the "speeding" version only. Overall, results suggest that all four versions of the Risky Driving Questionnaire are valid and reliable self-report instruments for measuring the attitudes, beliefs and behavioural intentions of young drivers.

All four versions of the Risky Driving Questionnaire may be employed in further research of speeding, drink-driving, driving while fatigued, and not wearing seat belts more extensively throughout the greater metropolitan Sydney area. Ongoing assessment of driver attitudes, beliefs and behaviours is required because it cannot be assumed that these attitudes, beliefs and behaviours will not change. In addition, the Risky Driving Questionnaires could be applied to new driver populations of interest. The Risky Driving Questionnaires may also be employed to ascertain the effectiveness of road safety campaigns.

The use of the Implicit Association Task

The dependence on self-report measures to provide information about beliefs and attitudes is a limitation of current research in this area, especially given the social stigma attached to behaviours such as speeding and drink-driving. Study 3 aimed to redress this issue via the use of the IAT. The IAT represents a hidden measure of attitudes. It measures differential associations of two target concepts with evaluations in a way that it is not obvious to participants that attitudes are being assessed at all. The two concepts appear in an initial discrimination task (e.g. speeding versus safe driving words), and the evaluation in a secondary discrimination task (e.g. positive versus negative words for an evaluation attribute). Upon making discriminations based

on a combination of these words, when instructions compel highly compatible categories (e.g. speeding + negative) to share a response key, performance should be faster than when less compatible categories (e.g. safe driving + negative) share a key. This performance difference implicitly measures differential association of the two concepts with the evaluation (Greenwald et al., 1998).

The present study introduced specific driving-related IAT versions (with one driving version developed for each of the four risky driving behaviours) to the field of road safety. Confirming expectation, consistently faster IAT performance was observed when associatively compatible categories (compared with associatively non-compatible categories) shared the same response. Positive IAT effects were observed for each of the four risky driving behaviours.

It might be argued that several of the concept words employed in the IAT task are associated with some evaluation words outside of the driving context, such that the IAT reflects this association rather than a driving-specific attitude. For example, "safe" may have a positive connotation which is independent of driving. We included concept words such as "safe", "sensible", "dangerous" and "reckless" because it is difficult to identify sufficient clearly driving-related words for the IAT procedure. We hoped that because these words were identified in instructions as driving-related, and because they were included in lists of more clearly driving-related words (e.g. speed, race), it was the driving-related meaning that participants thought of when they performed the task. If the more general meanings were considered, then we think it is not unreasonable to assume that a positive connotation of "safe" would extend to a positive connotation of "safe driving".

Despite these results illustrating that the IAT is sensitive to evaluative discriminations, results also indicate a generally insufficient relationship between the IAT and behavioural intention, contrary to research suggesting a relationship between that the IAT and associated behaviour (Marsh et al., 2001; Teachman et al., 2001). In examining the relationship between the IAT and behavioural intentions, contrary to expectation, the only significant correlation was observed between IAT effect and behavioural intentions to drink-drive, suggesting that higher negative

implicit attitude to drink-driving is significantly related to greater intention to engage in drink-driving behaviour.

Additionally, results indicate a generally insufficient relationship between the IAT and explicit attitude measures of the Risky Driving Questionnaire, contrary to literature illustrating significant correlations between IAT measures and relevant explicit measures (Greenwald et al., 1998; Greenwald & Nosek, 2001). For three of the four behaviours, IAT effect exhibited generally low (and statistically non-significant) correlations with explicit attitude scales. For driving while fatigued, results illustrate significant correlations between IAT effect and specific perceived susceptibility, specific perceived severity and peer influence, suggesting that higher negative implicit attitude to driving while fatigued is significantly related to a greater influence of driving while fatigued from friends, as well as higher perceived susceptibility to, and severity of, the consequences of driving while fatigued.

The present findings do not illustrate a consistent relationship between the IAT-measured implicit attitudes and Risky Driving Questionnaire self-report measures. Observed correlations with the IAT effect for driving while fatigued were consistent with predictions that might have been made assuming predictive validity of the self-report measures and an association between attitudes and perceived risks. However, the other observed correlations were contrary to prediction, and relatively few correlations were observed.

There may be several reasons why more predictable correlations were not demonstrated between the IAT and self-report measures.

5. The IAT may be invalid. However, the IAT has consistently been found to be a valid measure of attitudes in a number of other areas.
6. The Risky Driving Questionnaire may be invalid. Self-report attitude measures may be influenced by socially desirable responding, which has been a cause for concern in the measurement of self-reported road safety beliefs, attitudes and risky driving (Lajunen et al., 1997; Lajunen & Summala, 2003). However, evidence generally supports the Risky Driving Questionnaire as a reliable self-report instrument for measuring the attitudes, beliefs and behavioural intentions of young drivers

7. The IAT and self-report measures may actually measure slightly different underlying constructs. The IAT is designed to assess pure evaluative judgements, whereas the self-report measures assess factors which may contribute to such judgements.
8. The IAT may not be a sufficiently sensitive measure to demonstrate clear relationships. That is, while self-report measures discriminate between levels of a negative attitude (for example, by employing a Likert scale response format), the IAT demonstrates that a negative attitude exists, but may not clearly discriminate levels of the negative attitude.

Further research is necessary to elucidate the relationship between implicit attitudes, explicit attitudes and behavioural intentions.

Limitations and future research

While response bias is difficult to eliminate entirely, various features were built into the Risky Driving Questionnaire to control for response bias. The increased public scrutiny on road injuries and fatalities (particularly those involving young drivers) was emphasized when explaining the nature of the study to participants, and participants were asked to respond accurately and honestly to all questions. In addition, a short form of the Marlowe-Crowne Social Desirability Scale (Reynolds, 1982) was employed to assess socially desirable responding. The "bogus pipeline" technique (Jones & Sigall, 1971) was also employed to reduce motivation for socially desirable responses, by telling participants that their responses may be checked against official records. Future research would benefit from checking the driving records of participants, for analysis of crashes and infringements.

The Study 1 questionnaire took approximately 60-70 minutes to complete, with some subjects needing 85 minutes for completion. This may have created fatigue in the students, resulting in less reliable responding. The Study 2 questionnaire was shortened (by packaging each individual behaviour as one questionnaire version); however, questionnaire length remained a concern. Nevertheless, it was necessary to keep questionnaires at these lengths in order to measure a comprehensive range of factors. Also, there were no complaints from participants regarding questionnaire length.

In relation to the IAT, as this study represents possibly the first application of the IAT to risky driving, further investigation into the sensitivity of the IAT is warranted. There appears to be a difference in measurement sensitivity between implicit and explicit measures. That is, while self-report measures discriminate between levels of a negative attitude (for example, by employing a Likert scale response format), the IAT demonstrates that a negative attitude exists, but may not clearly discriminate levels of the negative attitude. Further research is also necessary to elucidate the relationship between implicit attitudes, explicit attitudes and behavioural intentions. In addition, the adaptation of the IAT to other risky driving behaviours, as well as the investigation of other beliefs, may be considered for future research.

The present results suggest that future research must focus on the factors that influence individual risky driving behaviours. Specific attitudes and beliefs, in particular, require continued investigation. The overall proportion of variance account for by the regression models examined for all behaviours ranged from 9.6% to 76.0%. Despite the efficacy of most models examined, results suggest that other factors may impact upon each of the four behaviours, and must be examined in future research. In particular, factors purported to influence seat belt use require further investigation, given that results revealed generally weak statistical regression models.

The above findings illustrate that there are many factors that do not predict many of the risky driving behaviours examined in the present study. These factors may emerge as significant predictors in a larger sample; however, future research would benefit more from focusing on the factors that already show a relationship with risky driving behaviour.

It must be noted that correlation does not equal causality. Because this research presents observational data, the causal sequence of events cannot be implied from the findings. For example, the finding that specific attitude to speeding correlates significantly with speeding behaviour does not tell the researcher whether the specific attitude causes the behaviour, or vice versa. With observational data, either sequence may be the case. Consequently, the next step in research is the manipulation (rather than observation) of the relevant underlying factors, and determination of their effects on the predicted risky driving behaviours, in order to assess the

underlying causal mechanisms. This research provides the basis for which to manipulate these underlying factors.

REFERENCES

Aberg, L., Larsen, L., Glad, A. & Beilinsson, L. (1997). Observed vehicle speed and drivers' perceived speed of others. *Applied Psychology: An International Review, 46(3)*, 287-302.

Adams-Guppy, J. R. & Guppy, A. (1995). Speeding in relation to perceptions of risk, utility and driving style by British company car drivers. *Ergonomics, 38*, 2525-2535.

Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour. In J. Kuhl & J. Beckmann (Eds.). *Action Control: From Cognition to Behaviour*. Berlin: Springer-Verlag.

Anastasi, A. & Urbina, S. (1997). *Psychological testing (7th Ed.).* Upper Saddle River, New Jersey: Prentice-Hall Inc.

Arnedt, J. T., Wilde, G. J. S., Munt P. W. & MacLean, A. W. (2001). How do prolonged wakefulness and alcohol compare in the decrements they produce on a simulated driving task? *Accident Analysis and Prevention, 33*, 337-344.

Arnett, J. J., Offer, D. & Fine, M. A. (1997). Reckless driving in adolescence: "State" and "trait" factors. *Accident Analysis and Prevention, 29*, 57-63.

Arthur, W., Tubre, T., Day, E. A., Sheehan, M. K., Sanchez-Ku, M. L., Paul, D., Paulus, L. & Archuleta, K. (2001). Motor vehicle crash involvement and moving violations: Convergence of self-report and archival data. *Human Factors, 43*, 1-11.

Australian Transport Safety Bureau (2006). http://www.atsb.gov.au/road/road.aspx

Ball, C. G., Kirkpatrick, A. W. & Brenneman, F. D. (2005). Noncompliance with seat-belt use in patients involved in motor vehicle collisions. *Canadian Journal of Surgery, 48(5)*, 367-374.

Barrick, M. R. & Mount, M. K. (1996). Effects of impression management and self-deception on the predictive validity of personality constructs. *Journal of Applied Psychology, 81(3)*, 261-272.

Becker, M. H. (1974). The health belief model and personal health behaviour. *Health Education Monographs, 2*, 324-473.

Begg, D. & Langley, J. (2001). Changes in risky driving behavior from age 21 to 26 years. *Journal of Safety Research, 32*, 491-499.

Beirness, D. J. (1993). Do we really drive as we live? The role of personality factors in road crashes. *Alcohol, Drugs and Driving, 9(3-4)*, 129-143.

Beirness, D. J. & Simpson, H. M. (1988). Lifestyle correlates of risky driving and accident involvement among youth. *Alcohol, Drugs and Driving, 4(3-4)*, 193-204.

Bell, N. J. & Bell, R. W. (1993). *Adolescent risk taking*. California: Sage Publications.

Blows, S., Ameratunga, S., Ivers, R. Q., Lo, S. K. & Norton, R. (2005a). Risky driving habits and motor vehicle injury. *Accident Analysis and Prevention, 37(4)*, 619-624.

Blows, S., Ivers, R. Q., Connor, J., Ameratunga, S., Woodward, M. & Norton, R. (2005b). Seatbelt non-use and car crash injury: An interview study. *Traffic Injury Prevention, 6*, 117-119.

Cameron, T. L. (1985). Psychosocial and behavioral factors in the prevention of young driver accidents. In D. Mayhew, H. Simpson & A. Donelson (Eds.). *Young driver accidents: In search of solutions*. Ottawa: Traffic Injury Research Foundation.

Chaudhary, N. K., Solomon M. G. & Cosgrove, L. A. (2004). The relationship between perceived risk of being ticketed and self-reported seat belt use. *Journal of Safety Research, 35*, 383-390.

Chua, F. J. & Job, R. F. S. (1999). Event-specific versus unitary causal accounts of optimism bias. *Journal of Behavioural Medicine, 22*, 457-490.

Clark, D. E. & Cushing, B. M. (2004). Rural and urban traffic fatalities, vehicle miles, and population density. *Accident Analysis and Prevention, 36(6)*, 967-972.

Clarke, D. D., Ward P. & Truman W. (2005). Voluntary risk taking and skill deficits in young driver accidents in the UK. *Accident Analysis and Prevention, 37*, 523-529.

Conner, M. & Norman, P. (1996). The role of social cognition in health behaviours. In M. Conner & P. Norman (Eds). *Predicting health behaviour* (pp.1-21). Buckingham: Open University Press.

Conner, M. & Sparks, P. (1996). The theory of planned behaviour and health behaviours. In M. Conner & P. Norman (Eds). *Predicting health behaviour* (pp.121-162). Buckingham: Open University Press.

Conte, J. M., Landy, F. J. & Mathieu, J. E. (1995). Time Urgency: Conceptual and Construct Development. *Journal of Applied Psychology, 80*, 178-185.

Corbett, C. (2001). Explanations for "understating" in self-reported speeding behaviour. *Transportation Research Part F, 4*, 133-150.

Corfitsen, M. T. (1994). Tiredness and visual reaction time among young male nighttime drivers: A roadside survey. *Accident Analysis and Prevention, 26(5)*, 617-624.

Finn, P. & Bragg, B. W. E. (1986). Perceptions of the risk of an accident by young and older drivers. *Accident Analysis and Prevention, 18(4)*, 255-271.

Dahlen, E. R., Martin, R. C., Ragan, K. & Kuhlman, M. M. (2005). Driving anger, sensation seeking, impulsiveness, and boredom proneness in the prediction of unsafe driving. *Accident Analysis and Prevention, 37*, 341-348.

Dalziel, J. R. & Job, R. F. S. (1995). Fatigue and taxi drivers: An examination of factors associated with motor vehicle accidents. *Proceedings of the 2nd International Conference on Fatigue and Transportation: engineering, enforcement and education solutions*, Freemantle, Western Australia: Promaco Conventions Pty Ltd.

Dalziel, J. R. & Job, R. F. S. (1997). Motor vehicle accidents, fatigue and optimism bias in taxi drivers. *Accident Analysis and Prevention, 29(4)*, 489-494.

Deery, H. A. & Love, A. W. (1996). The effect of a moderate dose of alcohol on the traffic hazard perception profile of young drink-drivers. *Addiction, 91(6)*, 815-827.

Deffenbacher, J. L., Oetting, E. R. & Lynch, R. S. (1994). Development of a driving anger scale. *Psychological Reports, 74*, 83-91.

DeJoy, D. M. (1989). The optimism bias and traffic accident risk perception. *Accident Analysis and Prevention, 21(4)*, 333-340.

DeJoy, D. M. (1992). An examination of gender differences in traffic accident risk perception. *Accident Analysis and Prevention, 24(3)*, 237-246.

Donovan, J. E. (2004). Adolescent alcohol initiation: A review of psychosocial risk factors. *Journal of Adolescent Health, 35*, 529.e7–529.e18.

Dunsire, M. & Baldwin, S. (1999). Urban-rural comparisons of drink-driving behaviour among late teens: A preliminary investigation. *Alcohol and Alcoholism: International Journal of the Medical Council on Alcoholism, 34(1)*, 59-64.

Ellickson, P. L. & Hays, R. D. (1991). Antecedents of drinking among young adolescents with different alcohol use histories. *Journal of Studies on Alcohol, 52*, 398 –408.

Endo, S., Ukawa, H., Sanada K. & Kitagawa, A. (1999). Simulation of speed control in acceleration mode of a heavy-duty vehicle. *JSAE Review, 20(1)*, 81-86.

Ennett, S. T. & Bauman, K. E. (1994). The contribution of influence and selection to adolescent peer group homogeneity: the case of adolescent cigarette smoking. *Journal of Personality and Social Psychology, 67*, 653–663.

Evans, L. (1987). Fatality risk reduction from safety belt use. *Journal of Trauma, 27(7)*, 746-749.

Evans, L. & Wasielewski, P. (1982). Do accident-involved drivers exhibit riskier everyday driving behavior? *Accident Analysis and Prevention, 14*, 57-64.

Evans, L. & Wasielewski, P. (1983). Risky driving related to driver and vehicle characteristics. *Accident Analysis and Prevention, 15*, 121-136.

Faunce, G.J., & Job, R.F.S. (2000). The Stroop colour naming task and addictive behaviour: Some recommendations. *Addiction*, *95(9)*, 1438-1439.

Fernandes, R. & Job, R. F. S. (2003). Different factors predict different risky driving behaviours: A challenge to the assumed generalizability of prediction and countermeasure. In *Proceedings of the 2003 Road Safety Research, Policing and Education Conference.* Sydney, Australia: ICE Australia Pty Ltd, September 2003.

Fernandes, R., Job, R. F. S. & Hatfield, J. (2004). Young driver characteristics in the prediction of drink-driving: Comparing drink-driving with a range of driving behaviours. In J. Oliver, P. Williams, A. Clayton (Eds.). *Proceedings of the 17th International Conference on Alcohol, Drugs and Traffic Safety, 2004.* Glasgow, Scotland: X-CD Technologies, August 2004.

Fell, D. L. & Black, B. (1997). Driver fatigue in the city. *Accident Analysis and Prevention, 29(4)*, 463-469.

Fildes, B. N. & Lee, S. J. (1993). The speed review: road environment, behaviour, speed limits, enforcement and crashes. *Contract reports for Australian Transport Safety Bureau*. Available from: http://www.monash.edu.au/muarc/reports/atsb127.html.

Finken, L. L., Jacobs, J. E. & Laguna, K. D. (1998). Risky driving and driving/riding decisions: The role of previous experience. *Journal of Youth and Adolescence, 27(4)*, 493-502.

Greenwald, A. G., McGhee, D. E. & Schwartz, J. L.K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74,* 1464-1480.

Greenwald, A. G. & Nosek, B. A. (2001). Health of the Implicit Association Test at age 3. *Zeitschrift fur Experimentelle Psychologie, 48,* 85-93.

Gulliver, P. & Begg, D. (2004). Influences during adolescence on perceptions and behaviour related to alcohol use and unsafe driving as young adults. *Accident Analysis and Prevention, 36*, 773-781.

Harre, N., Field, J. & Kirkwood, B. (1996). Gender differences and areas of common concern in the driving behaviors and attitudes of adolescents. *Journal of Safety Research, 27(3)*, 163-173.

Horne, J. A. & Reyner, L. A. (1995). Sleep related vehicle accidents. *British Medical Journal, 310*, 565-567.

Horvath, P. & Zuckerman, M. (1993). Sensation seeking, risk appraisal, and risky behavior. *Journal of Personality and Individual Differences, 14(1)*, 41-52.

Iversen, H. (2004). Risk-taking attitudes and risky driving behaviour. *Transportation Research Part F, 7*, 135-150.

Janz, N. K. & Becker, M. H. (1984). The health belief model: A decade later. *Health Education Quarterly, 11(1)*, 1-47.

Jessor, R. (1998). *New perspectives on adolescent risk behavior*. Cambridge: Cambridge University Press.

Job, R. F. S. (1988). Effective and ineffective use of fear in health promotion campaigns. *American Journal of Public Health, 78*, 163-167.

Job, R. F. S. (1990a). The application of learning theory to driving confidence: The effect of age and the impact of random breath testing. *Accident Analysis and Prevention, 22*, 97-107.

Job, R. F. S. (1990b). Psychological aspects in the implementation of road safety programmes. *The Proceedings of the Third Biennial National Traffic Evaluation Conference*. Armidale, NSW: E.M.U Press.

Job, R. F. S. (1993). The problem of risk taking with increased education and skill. *The Proceedings of the Fourth Biennial Australasian Traffic Education Conference*. Armidale, NSW: EMU Press.

Job, R. F. S. (1995). The road safety problem: Causes and countermeasures. In D. T. Kenny & R. F. S. Job (Eds.). *Australia's adolescents: A health psychology perspective* (pp. 128-138). Armidale: University of New England Press.

Job, R. F. S. (1999). The road user: The psychology of road safety. In J. Clark (Ed.) *Safe and mobile: Introductory studies in traffic safety*. Armidale: EMU.

Job, R. F. S. & Dalziel, J. R. (2000). Defining fatigue as a condition of the organism and distinguishing it from habituation, adaptation, and boredom. In P. A. Hancock & P. A. Desmond (Eds.) *Stress, Workload, and Fatigue* (pp.466-475). New Jersey: Lawrence Erlbaum.

Jonah, B. A. (1986). Accident risk and risk-taking behaviour among young drivers. *Accident Analysis and Prevention, 18*, 255-271.

Jonah, B. A. (1990). Age differences in risky driving. *Health Education Research, 5*, 139-149.

Jonah, B. A. (1997). Sensation seeking and risky driving: A review and synthesis of the literature. *Accident Analysis and Prevention, 29(5)*, 651-665.

Jonah, B. A. & Dawson, N. E. (1987). Young and risky: Age differences in risky driving, risk perception, and risk utility. *Alcohol, Drugs and Driving, 3(3-4)*, 13-29.

Jonah, B. A., Thiessen, R. & Au-Yeung, E. (2001). Sensation seeking, risky driving and behavioral adaptation. *Accident Analysis & Prevention, 33*, 679-684.

Jones, E. E. & Sigall, H. (1971). The bogus pipeline: A new paradigm for measuring affect and attitude. *Psychological Bulletin, 76,* 349-364.

Khorashadi, A., Niemeier, D., Shankar, V. & Mannering, F. (2005). Differences in rural and urban driver-injury severities in accidents involving large-trucks: An exploratory analysis. *Accident Analysis and Prevention, 37(5)*, 910-921.

Kim, D.-Y. & Greenwald, A. G. (1998). *Voluntary controllability of implicit cognition: can implicit attitudes be faked?* Paper presented at meetings of the Midwestern Psychological Association, Chicago. May 1998.

Kohn, P. M. (1972). The Authoritarianism-Rebellion scale: A balanced F Scale with left-wing reversals. *Sociometry, 35*, 176-189.

Lajunen, T., Corry, A., Summala, H. & Hartley, L. (1997). Impression management and self-deception in traffic behaviour inventories. *Personality and Individual Differences, 22(3)*, 341-353.

Lajunen, T. & Rasanen, M. (2004). Can social psychological models be used to promote bicycle helmet use among teenagers? A comparison of the Health Belief Model, Theory of Planned Behavior and the Locus of Control. *Journal of Safety Research, 35*, 115-123.

Lajunen, T. & Summala, H. (2003). Can we trust self-reports of driving? Effects of impression management on driver behaviour questionnaire responses. *Transportation Research Part F, 6*, 97-107.

Landy, F. J., Rastegary, H., Thayer, J. & Colvin, C. (1991). Time Urgency: The Construct and Its Measurement. *Journal of Applied Psychology, 76*, 644-657.

Lee, S. H. V. & Job, R. F. S. (1992). Optimism bias: The role of cognitive errors in contingency judgements. *International Journal of Psychology, 27*, 285.

Lin, M., Huang, W., Hwang, H., Wu H. I. & Yen, L. (2004). The effect of crash experience on changes in risk taking among urban and rural young people. *Accident Analysis and Prevention, 36(2)*, 213-222.

Marsh, K. L., Johnson, B. T. & Scott-Sheldon, L. A. J. (2001). Heart versus reason in condom use: Implicit versus explicit attitudinal predictors of sexual behavior. *Zeitschrift fur Experimentelle Psychologie, 48,* 161-175.

Matthews, G. & Desmond, P. A. (1998). Personality and multiple dimensions of task-induced fatigue: a study of simulated driving. *Personality and Individual Differences, 25*, 443-458.

Matthews, M. L. & Moran, A. R. (1986). Age differences in male drivers' perception of accident risk: The role of perceived driving ability. *Accident, Analysis and Prevention, 18*, 457-464.

McCarthy, D. M., Pedersen, S. L. & Leuty, M. E. (2005). Negative consequences and cognitions about drinking and driving. *Journal of Studies on Alcohol, 66(4)*, 567-570.

Mesken, J., Lajunen, T. & Summala, H. (2002). Interpersonal violations, speeding violations and their relation to accident involvement in Finland. *Ergonomics, 45(7)*, 469-483.

Moore, R. H. (1994). Underage female DUI offenders: Personality characteristics, psychosocial stressors, alcohol and other drug use, and driving risk. *Psychological Reports, 74*, 435-445.

Moore, V. M., Dolinis, J. & Woodward, A. J. (1995). Vehicle speed and risk of a severe crash. *Epidemiology, 6*, 258–262.

Morgan, G. A. & Job, R. F. S. (1995). Red light cameras: Driver's knowledge, attitudes, and behaviours. In D. Kenny & R. F. S. Job (Eds.). *Australia's Adolescents: A Health Psychology Perspective* (pp.144-150). Armidale, Australia: New England University Press.

Norris, F. H., Matthews, B. A. & Riad, J. K. (2000). Characterological, situational, and behavioral risk factors for motor vehicle accidents: A prospective examination. *Accident Analysis and Prevention, 32*, 505-515.

O'Brien, S., Tay, R. & Watson, B. (2002). An exploration of Australian driving anger. *Proceedings of the 2002 Road Safety Research, Policing and Education Conference*. November 2002, Adelaide, Australia.

Pack, A. I., Pack, A. M., Rodgman, E., Cucchiara, A., Dinges, D. F. & Schwab, C. W. (1995). Characteristics of crashes attributed to the driver having fallen asleep. *Accident Analysis and Prevention, 32*, 493-505.

Parker, D., Lajunen, T. & Stradling, S. (1998). Attitudinal predictors of interpersonally aggressive violations on the road. *Transportation Research Part F, 1*, 11-24.

Parker, D., Manstead, S. R., Stradling, S. G. & Reason, J. T. (1992). Determinants of intention to commit driving violations. *Accident Analysis and Prevention, 24*, 117-131.

Parker, D., Reason, J. T., Manstead, A. S. R. & Stradling, S. G. (1995). Driving errors, driving violations and accident involvement. *Ergonomics, 38*, 1036-1048.

Paulhus, D. L. (1984). Two-component models of socially desirable responding. *Journal of Personality and Social Psychology, 46*, 598-609.

Paulhus, D. L. (1989). Socially desirable responding: Some new solutions to old problems. In D. M. Buss & N. Cantor (Eds.), *Personality psychology: Recent trends and emerging directions* (pp. 201-209). New York: Springer-Verlag.

Placanica, J. L., Faunce, G. J. & Job, R. F. S. (2002). The effect of fasting on attentional biases for food and body shape/weight words in high and low eating disorder inventory scorers. *International Journal of Eating Disorders, 32*, 79-90.

Prabhakar, T., Lee, S. H. V. & Job, R. F. S. (1996). Risk taking, optimism bias and risk utility in young drivers. *Proceedings of the Road Safety Research and Enforcement Conference* (pp.61-68). Sydney, Australia: Roads & Traffic Authority of NSW.

Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *Journal of Clinical Psychology, 38*, 119-125.

Roads and Traffic Authority of NSW (2002). http://www.rta.nsw.gov.au/safety/c_c.html

Roads and Traffic Authority of NSW (2004). *Road Traffic Crashed in NSW – 2003*. Report prepared by the Information Section, Road Safety Strategy Branch.

Roads and Traffic Authority of NSW (2005). *Road Traffic Crashed in NSW: 2004*. Report prepared by the Information Section, Road Safety Strategy Branch.

Roads and Traffic Authority of NSW (2006). http://www.rta.nsw.gov.au

Robinson, J. P., Shaver, P. R. & Wrightsman, L. S. (1991). *Measures of personality and social psychological attitudes*. San Diego: Academic Press.

Roese, N. J. & Jamieson, D. W. (1993). Twenty years of bogus pipeline research: A critical review and meta-analysis. *Psychological Bulletin, 114(2)*, 363-375.

Simons-Morton, B., Lerner, N. & Singer, J. (2005). The observed effects of teenage passengers on the risky driving behavior of teenage drivers. *Accident Analysis and Prevention, 37*, 973-982.

Spielberger, C. D. (1988). *State-Trait Anger Expression Inventory*. Odessa, USA: Psychological Assessment Resources.

Steffens, M. C. & Buchner, A. (2003). Implicit Association Test: Separating transsituationally stable and variable components of attitudes toward gay men. *Experimental Psychology, 50(1)*, 33-48.

Sutton, S. (1998). Predicting and explaining intentions and behaviour: How well are we doing? *Journal of Applied Social Psychology, 28*, 1317-1338.

Svenson, O. (1981). Are we all less risky and more skillful than our fellow drivers? *Acta Psychologica, 47(2)*, 143-148.

Svenson, O., Fischhoff B. & MacGregor, D. (1985). Perceived driving safety and seatbelt usage. *Accident Analysis and Prevention, 17(2)*, 119-133.

Swanson, J. E., Rudman, L. A. & Greenwald, A. G. (2001). Using the Implicit Association Test to investigate attitude-behaviour consistency for stigmatised behaviour. *Cognition and Emotion, 15,* 207-230.

Tanner, R. J., Stopa, L. & De Houwer, J. (in press). Implicit views of the self in social anxiety. *Behaviour Research and Therapy*. Available online 9 December 2005.

Teachman, B. A., Gregg, A. P. & Woody, S. R. (2001). Implicit associations for fear-relevant stimuli among individuals with snake and spider fears. *Journal of Abnormal Psychology, 110,* 226-235.

Thiffault, P. & Bergeron, J. (2003). Fatigue and individual differences in monotonous simulated driving. *Personality and Individual Differences, 34*, 159-176.

Turner, C., McClure, R. & Pirozzo, S. (2004). Injury and risk-taking behaviour – a systematic review. *Accident Analysis and Prevention, 36(1)*, 93-101.

Ulleberg, P. & Rundmo, T. (2002). Risk-taking attitudes among young drivers: The psychometric qualities and dimensionality of an instrument to measure young drivers' risk-taking attitudes. *Scandinavian Journal of Psychology, 43*, 227-237.

van Beurden, E., Zask, A., Brooks L. & Dight, R. (2005). Heavy episodic drinking and sensation seeking in adolescents as predictors of harmful driving and celebrating behaviors: Implications for prevention. *Journal of Adolescent Health, 37*, 37-43.

Vernon, D. D., Cook, L. J., Peterson, K. J. & Michael Dean, J. (2004). Effect of repeal of the national maximum speed limit law on occurrence of crashes, injury crashes, and fatal crashes on Utah highways. *Accident Analysis and Prevention, 36*, 223–229.

Verwey, W. B. & Zaidel, D. M. (2000). Predicting drowsiness accidents from personal attributes, eye blinks and ongoing driving behaviour. *Personality and Individual Differences, 28*, 123-142.

Wagenaar, A.C., Streff F. M. & Schultz, R. H. (1990). Effects of the 65 mph speed limit on injury morbidity and mortality. *Accident Analysis Prevention, 22*, 571–585.

Wasielewski, P. (1984). Speed as a measure of driver risk: Observed speeds versus driver and vehicle characteristics. *Accident Analysis and Prevention, 16(2)*, 89-103.

Weinstein, N. D. & Klein, W. M. (1996). Unrealistic optimism: Present and future. *Journal of Social & Clinical Psychology, 15*, 1-8.

Weinstein, N. D. & Lyon, J. E. (1999). Mindset, optimism bias about personal risk and health-protective behaviour. *British Journal of Health Psychology, 4*, 289-300.

Weiten, W. (2001). *Psychology: Themes and Variations (4th Ed.)*. Stamford: Wadsworth, Thomson Learning, Inc.

West, R. J., French, D., Kemp, R. & Elander, J. (1993). Direct observation of driving, self reports of driver behaviour, and accident involvement. *Ergonomics, 36*, 557-567.

West, R., Wilding, J., French, D., Kemp, R. & Irving, A. (1993). Effect of low and moderate doses of alcohol on driving hazard perception latency and driving speed, *Addiction, 88*, 527-532.

Williams, A. F. (1998). Risky driving behavior among adolescents. In R. Jessor (Ed.). *New perspectives on adolescent risk behavior* (pp. 221-237). Cambridge: Cambridge University Press.

Williamson, A. (2000). Why are young drivers over-represented in crashes? In: *Proceedings of the Motor Accidents Authority Young Driver Seminar*. Motor Accidents Authority, Sydney.

Yagil, D. (2000). Beliefs, motives and situational factors related to pedestrians' self-reported behavior at signal-controlled crossings. *Transportation Research Part F, 3*, 1-13.

Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. Cambridge: Cambridge University Press.

Zuckerman, M. (1980). Sensation seeking and its biological correlates. *Psychological Bulletin, 88*, 187-214.

ACKNOWLEDGEMENT

The researchers thank the Motor Accidents Authority of NSW for funding this research as part of the 2003-2004 Motor Accidents Authority Road Safety Grants Program.

Dr. Julie Hatfield was supported by an NHMRC Population Health Capacity Building Grant in Injury Prevention, Trauma and Rehabilitation [ITR]. ITR is a collaborative program auspiced by the NSW Injury Risk Management Research Centre, UNSW; The George Institute for International Health, University of Sydney; Prince of Wales Medical Research Institute (UNSW); the School of Public Health and Community Medicine (UNSW); and the Rehabilitation Studies Unit.

APPENDIX A: PARTICIPANT INFORMATION SHEET

THE UNIVERSITY OF NEW SOUTH WALES

IRMRC

Approval No: HREC 04064

NSW INJURY RISK MANAGEMENT RESEARCH CENTRE, THE UNIVERSITY OF NEW SOUTH WALES
(AND THE MOTOR ACCIDENTS AUTHORITY OF NSW)

PARTICIPANT INFORMATION STATEMENT

Project Title: Drivers' Attitudes toward Various Risky Driving Behaviours

[Participant selection and purpose of study]
You are invited to participate in a study of 'driver risk-taking attitudes and behaviours'. We hope to learn about the different ways that young drivers think about, and behave in response to, a range of risky driving behaviours. We aim to better understand both the risks young people take on the road as well as the ways in which young motorists can be best informed of the dangers associated with performing risky driving behaviours. You were selected as a possible participant in this study because you are a young motorist living in the Sydney metropolitan area. This research is designed to help in the development of campaigns to improve road safety.

[Description of study and risks]
If you decide to participate, you will be asked to complete a short questionnaire about your attitudes toward road safety and various risky driving behaviours, as well as questions about various personal characteristics (e.g. driving experience). It should take you no more than 15-25 minutes to complete. Aside from this time, there should be no other inconvenience to you. If you consent, we would also like to check participants' driving records, which will further help our understanding of road safety issues for young drivers.

[Confidentiality and disclosure of information]
Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission, except as required by law. If you give us your permission by signing this document, we plan to discuss the results with The University of New South Wales, the NSW Injury Risk Management Research Centre, and the Motor Accidents Authority of NSW. Results from this project will only be presented to the scientific community. In any publication, information will be provided in such a way that you cannot be identified.

[Your consent]
Your participation in this study is entirely voluntary. Your decision whether or not to participate will not prejudice your future relations with The University of New South Wales, the NSW Injury Risk Management Research Centre, or the Motor Accidents Authority of NSW. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without prejudice.

Complaints may be directed to the Ethics Secretariat, The University of New South Wales, Sydney 2052, AUSTRALIA (phone 9385 4234, fax 9385 6648, email ethics.sec@unsw.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome. If you have any questions, please feel free to ask us. If you have any additional questions later, the Senior Research Officer, Mr. Ralston Fernandes (phone 9385 5354, email r.fernandes@unsw.edu.au) will be happy to answer them.

You may keep this form.

APPENDIX B: CONSENT FORM

THE UNIVERSITY OF NEW SOUTH WALES

Approval No: HREC 04064

NSW INJURY RISK MANANGEMENT RESEARCH CENTRE, THE UNIVERSITY OF NEW SOUTH WALES
(AND THE MOTOR ACCIDENTS AUTHORITY OF NSW)

CONSENT FORM

(Project Title: Drivers' Attitudes toward Various Risky Driving Behaviours)

You are making a decision whether or not to participate. Your signature indicates that, having read the Participant Information Statement, you have decided to take part in the study.

I consent to completing the following questionnaire.

YES / NO

I consent to providing my driver's licence for the present researchers to access my driving records.

If YES, please provide Driver's Licence No. _____ / NO

.....	.....
Signature of Research Participant	Signature of Witness
.....	.....
(Please PRINT name)	(Please PRINT name)
.....	.....
Date	Nature of Witness

.....
Signature(s) of Investigator(s)

.....
Please PRINT Name

APPENDIX C: REVOCATION OF CONSENT FORM

THE UNIVERSITY OF NEW SOUTH WALES

Approval No: HREC 04064

REVOCATION OF CONSENT

(*Project Title: Drivers' Attitudes toward Various Risky Driving Behaviours*)

I hereby wish to **WITHDRAW** my consent to participate in the research proposal described above and understand that such withdrawal **WILL NOT** jeopardise any treatment or my relationship with The University of New South Wales, the NSW Injury Risk Management Research Centre, or the Motor Accidents Authority of NSW.

....
Signature Date

.....
Please PRINT Name

The section for Revocation of Consent should be forwarded to the Chief Investigator, Mr. Ralston Fernandes, at the NSW Injury Risk Management Research Centre, Level 8 Applied Science Building, The University of New South Wales, NSW, 2052.

APPENDIX D: COMPLETE VERSION OF THE "SPEEDING" RISKY DRIVING QUESTIONNAIRE

THE UNIVERSITY OF NEW SOUTH WALES

IRMRC

NSW Injury Risk Management Research Centre
The University of New South Wales

Thank you for consenting to participate in this survey. The survey is anonymous, and will take approximately 10 minutes to complete. Please do not write your name on the questionnaire. For all questions, please answer as accurately and honestly as possible. If you have any concerns or queries you may call **Ralston Fernandes at the University of New South Wales, on 9385 5354** or the **UNSW Ethics Secretariat on 9385 4234**.

SECTION ONE

Compared to the average driver of your age and gender, how would you rate the following? (Please circle your response)

	Much lower than average	Lower than average	Same as average	Higher than average	Much higher than average
a) Your chances of staying healthy during next winter?	1	2	3	4	5
b) Your chances of being fined while driving?	1	2	3	4	5
c) Your chances of being injured in a road crash while driving within the next 2 years?	1	2	3	4	5
d) Your chances of developing cancer?	1	2	3	4	5
e) Your chances of being fined for speeding?	1	2	3	4	5
f) Your chances of being injured in a road crash while you are speeding?	1	2	3	4	5

SECTION TWO

Please rate the extent to which you agree or disagree with each of the following statements, by circling any one of the 7 response options below.

	Strongly Agree			Neutral			Strongly Disagree
1. Having a car crash would result in serious injuries that would interfere with my life.	1	2	3	4	5	6	7
2. Losing my licence would interfere significantly with my social life / leisure activities.	1	2	3	4	5	6	7
3. My driving style makes it likely that I will be caught by the police.	1	2	3	4	5	6	7
4. Getting a fine would make it financially difficult for me to get through the month.	1	2	3	4	5	6	7
5. Losing my licence would interfere significantly with my work.	1	2	3	4	5	6	7
6. Being injured in a car crash would cause significant problems in my life.	1	2	3	4	5	6	7
7. My chances of having a car crash are very small.	1	2	3	4	5	6	7
8. If I speed, it increases my chances of having a car crash.	1	2	3	4	5	6	7
9. Driving within the speed limit would mean that it takes longer to get to my destination.	1	2	3	4	5	6	7
10. Driving within the speed limit would make me feel secure and comfortable.	1	2	3	4	5	6	7
11. Not speeding involves the inconvenience of having to plan my travels in advance, in order to get to my destination on time.	1	2	3	4	5	6	7
12. My chances of being fined for my driving are high.	1	2	3	4	5	6	7
13. If I speed, it increases my chances of being fined by the police.	1	2	3	4	5	6	7
14. Sticking to the speed limit has the benefit of saving me money on petrol consumption.	1	2	3	4	5	6	7
15. Driving within the speed limit would make me feel frustrated because I can't keep up with traffic.	1	2	3	4	5	6	7
16. By not speeding, I avoid wear and tear on the engine of my car.	1	2	3	4	5	6	7
17. There is a good possibility that I will lose some points from my licence while driving.	1	2	3	4	5	6	7
18. If I speed, it increases my chances of losing some points from my licence.	1	2	3	4	5	6	7

	Strongly Agree			Neutral			Strongly Disagree
19. Driving within the speed limit would allow me to avoid disapproval from my parents.	1	2	3	4	5	6	7
20. Driving within the speed limit would mean that people don't think I'm a negligent or dangerous driver.	1	2	3	4	5	6	7
21. Driving within the speed limit would mean that I miss out on the excitement of speeding.	1	2	3	4	5	6	7
22. Not speeding would mean that my friends might think I'm gutless.	1	2	3	4	5	6	7
23. My friends influence my decision about whether or not to speed.	1	2	3	4	5	6	7

SECTION THREE

For each of the following questions, you are asked how often you perform a particular behaviour in a particular circumstance. Please give your response as a percentage of the times you are in that circumstance, with a straight vertical line on the percentage scale given. You may place your vertical line anywhere along the scale to indicate any percentage.

1. How often would you drive at 66-75km/hr in a 60km/hr speed zone?

|_____|_____|

0% of such occasions *50%* *100% of such occasions*

2. How often would you drive at more than 75km/hr in a 60km/hr speed limit zone?

|_____|_____|

0% of such occasions *50%* *100% of such occasions*

3. How often would you drive at 106-115km/hr in a 100km/hr speed limit zone?

|_____|_____|

0% of such occasions *50%* *100% of such occasions*

4. How often would you drive at more than 115km/hr in a 100km/hr speed limit zone?

|_____|_____|

0% of such occasions *50%* *100% of such occasions*

SECTION FOUR

Please read the following statements and circle one of the response options, indicating your level of agreement with each item. You may circle any of the 6 numbers below.

		disagree strongly	disagree somewhat	disagree slightly	agree slightly	agree somewhat	agree strongly
1.	Obedience and respect for authority are the most important virtues people should learn.	1	2	3	4	5	6
2.	What we need least is an authority to tell us what to do or how to do it.	1	2	3	4	5	6
3.	Every person should have complete faith in some supernatural power, whose decisions must be obeyed without question.	1	2	3	4	5	6
4.	No principle is more immoral than that of obedience.	1	2	3	4	5	6
5.	Obedience is the mother of success.	1	2	3	4	5	6
6.	Strong discipline builds moral character.	1	2	3	4	5	6
7.	Obedience is the mother of enslavement.	1	2	3	4	5	6
8.	True morality only develops in a fully permissive environment.	1	2	3	4	5	6
9.	No principle is more noble or holy than that of true obedience.	1	2	3	4	5	6
10.	Obedience and respect for authority aren't virtues and shouldn't be taught to children.	1	2	3	4	5	6
11.	To be a decent person, always stay within the law.	1	2	3	4	5	6
12.	Faith in the supernatural is a harmful self-delusion, and submission to religious authority is dangerous.	1	2	3	4	5	6

SECTION FIVE

1. In the past 2 years, how many times have you been fined for any traffic infringements (other than parking fines)? NEVER / ___times
   (Please circle 'Never' or indicate the number of fines) ***(If 'NEVER', go to Q.3 below)***

2. In the past 2 years, how many times have you been fined for speeding? NEVER / ___times
   (Please circle 'Never' or indicate the number of fines)

3. In the past 2 years, how many times have you been involved in a crash of any type (including crashes with pedestrians and stationary objects, etc.) while you were driving? NEVER / ___times
   (Please circle 'Never' or indicate the number of crashes) ***(If 'NEVER', go to Section 8)***

4. Of these crashes, how many would be a result of speeding? _____

SECTION SIX

For each of the following statements, please indicate whether they are true or false. Please circle either "T" (for true) or "F" (for false) for each of the statements.

1.	It is sometimes hard for me to go on with my work if I am not encouraged.	T	F
2.	I sometimes feel resentful when I don't get my way.	T	F
3.	On a few occasions, I have given up doing something because I thought too little of my ability.	T	F
4.	There have been times when I felt like rebelling against people in authority even though I knew they were right.	T	F
5.	No matter whom I'm talking to, I'm always a good listener.	T	F
6.	There have been occasions when I took advantage of someone.	T	F
7.	I'm always willing to admit it when I make a mistake.	T	F
8.	I sometimes try to get even rather than forgive and forget.	T	F
9.	I am always courteous, even to people who are disagreeable.	T	F
10.	I have never been annoyed when people expressed ideas very different from my own.	T	F
11.	There have been times when I was quite jealous of the good fortune of others.	T	F
12.	I am sometimes irritated by people who ask favours of me.	T	F
13.	I have never deliberately said something that hurt someone's feelings.	T	F

SECTION SEVEN

Please read the following list of statements and assess how appropriate they are of yourself and situations in your life. Please circle the number that corresponds to your assessment for each statement, using the following scale as a guide. You may circle any of the 7 numbers below.

		Never or Definitely not			Neutral			Always or Definitely
1.	Slow doing things	1	2	3	4	5	6	7
2.	Pressed for time	1	2	3	4	5	6	7
3.	Work is slow and deliberate	1	2	3	4	5	6	7
4.	Go "all out"	1	2	3	4	5	6	7
5.	Need to excel	1	2	3	4	5	6	7
6.	Bossy or dominating	1	2	3	4	5	6	7
7.	Never in a rush	1	2	3	4	5	6	7
8.	Dangerous and competitive driving	1	2	3	4	5	6	7
9.	Work slowly	1	2	3	4	5	6	7
10.	Do things in a hurry	1	2	3	4	5	6	7
11.	Ambitious	1	2	3	4	5	6	7
12.	Others rate me as easy going	1	2	3	4	5	6	7
13.	Work fast	1	2	3	4	5	6	7
14.	In a hurry	1	2	3	4	5	6	7
15.	Work quickly and energetically	1	2	3	4	5	6	7
16.	Consider myself as easy going	1	2	3	4	5	6	7

SECTION EIGHT

Each of the items below contains two choices, A and B. Please indicate the statement which best describes your likes or the way you feel, by circling either A or B. If you do not like either statement, choose the one you dislike least. Please circle one statement for each question, and do not leave any items blank.

1. A. I often wish I could be a mountain climber.
   B. I can't understand people who risk their necks climbing mountains.

2. A. A sensible person avoids activities that are dangerous.
   B. I sometimes like to do things that are a little frightening.

3. A. I would like to take up the sport of water skiing.
   B. I would not like to take up water skiing.

4. A. I would like to try surfing.
   B. I would not like to try surfing.

5. A. I would not like to learn to fly an airplane.
   B. I would like to learn to fly an airplane.

6. A. I prefer the surface of the water to the depths.
   B. I would like to go scuba diving

7. A. I would like to try skydiving.
   B. I would never want to try jumping out of a plane, with or without a parachute.

8. A. I like to dive off the high board.
   B. I don't like the feeling I get standing on the high board (or I don't go near it at all).

9. A. Sailing long distances in small sailing crafts is foolish.
   B. I would like to sail a long distance in a small but seaworthy sailing craft.

10. A. Skiing down a high mountain slope is a good way to end up on crutches.
    B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

SECTION NINE

Imagine that each of the situations below is actually happening to you, then rate the amount of anger you would feel, by circling any one of the 5 response options below.

	Not at all	A little	Some	Much	Very much
1. Someone is weaving in and out of traffic.	1	2	3	4	5
2. A slow vehicle on a mountain road will not pull over and let people by.	1	2	3	4	5
3. Someone backs right in front of you without looking.	1	2	3	4	5
4. You are stuck in a traffic jam.	1	2	3	4	5
5. Someone honks at you about your driving.	1	2	3	4	5
6. A police officer pulls you over.	1	2	3	4	5

SECTION TEN

Please rate the severity of the following circumstances, in terms of the impact they would have in your life, by circling one of the response options. You may circle any of the 7 numbers below.

	Extremely severe			Average severity			Not severe at all
How severe are the consequences of SPEEDING, in terms of the FINES you would receive?	1	2	3	4	5	6	7
How severe are the consequences of SPEEDING, in terms of the POINTS you would lose?	1	2	3	4	5	6	7
How severe are the consequences of SPEEDING, in terms of the INJURIES you would receive?	1	2	3	4	5	6	7

SECTION ELEVEN

1. Are you male or female (please circle)? Male / Female

2. How old were you at your last birthday (in years)? _____

3. What is the main language spoken at your home? _____

4. What is your postcode? _____

5. What is the status of you driver's licence (please circle)?
   (1) Learners (2) Red P (3) Green P (4) Ordinary (5) Silver (6) Gold

6. How long have you held a driver's licence (including L-plates)? ___yrs, ___mths

APPENDIX E: COMPLETE VERSION OF THE "DRINK-DRIVING" RISKY DRIVING QUESTIONNAIRE

THE UNIVERSITY OF NEW SOUTH WALES

IRMRC

NSW Injury Risk Management Research Centre
The University of New South Wales

Thank you for consenting to participate in this survey. The survey is anonymous, and will take approximately 10 minutes to complete. Please do not write your name on the questionnaire. For all questions, please answer as accurately and honestly as possible. If you have any concerns or queries you may call **Ralston Fernandes at the University of New South Wales, on 9385 5354** or the **UNSW Ethics Secretariat on 9385 4234**.

SECTION ONE

Compared to the average driver of your age and gender, how would you rate the following? (Please circle your response)

		Much lower than average	Lower than average	Same as average	Higher than average	Much higher than average
a)	Your chances of staying healthy during next winter?	1	2	3	4	5
b)	Your chances of being fined while driving?	1	2	3	4	5
c)	Your chances of being injured in a road crash while driving within the next 2 years?	1	2	3	4	5
d)	Your chances of developing cancer?	1	2	3	4	5
e)	Your chances of being fined for drink-driving?	1	2	3	4	5
f)	Your chances of being injured in a road crash while you are drink-driving?	1	2	3	4	5

SECTION TWO

Please rate the extent to which you agree or disagree with each of the following statements, by circling any one of the 7 response options below.

		Strongly Agree			Neutral			Strongly Disagree
1.	Having a car crash would result in serious injuries that would interfere with my life.	1	2	3	4	5	6	7
2.	Losing my licence would interfere significantly with my social life / leisure activities.	1	2	3	4	5	6	7
3.	My driving style makes it likely that I will be caught by the police.	1	2	3	4	5	6	7
4.	Getting a fine would make it financially difficult for me to get through the month.	1	2	3	4	5	6	7
5.	Losing my licence would interfere significantly with my work.	1	2	3	4	5	6	7
6.	Being injured in a car crash would cause significant problems in my life.	1	2	3	4	5	6	7
7.	My chances of having a car crash are very small.	1	2	3	4	5	6	7
8.	If I drink-drive, it increases my chances of having a car crash.	1	2	3	4	5	6	7
9.	Not drink-driving would allow me to avoid disapproval from my parents.	1	2	3	4	5	6	7
10.	Not drink-driving would mean that people don't think I'm a negligent or dangerous driver.	1	2	3	4	5	6	7
11.	Not drink-driving would mean that my friends might think I'm gutless.	1	2	3	4	5	6	7
12.	My chances of being fined for my driving are high.	1	2	3	4	5	6	7
13.	If I drink-drive, it increases my chances of being fined by the police.	1	2	3	4	5	6	7
14.	I find it frustrating to limit my drinks because I have to drive.	1	2	3	4	5	6	7
15.	Getting alternative transport to avoid drink-driving (e.g. getting a lift from a friend) has the benefit of saving me money on petrol consumption.	1	2	3	4	5	6	7
16.	By not drink-driving, I miss out on the excitement of drink-driving.	1	2	3	4	5	6	7
17.	There is a good possibility that I will lose some points from my licence while driving.	1	2	3	4	5	6	7
18.	If I drink-drive, it increases my chances of losing some points from my licence.	1	2	3	4	5	6	7
19.	Not drink-driving involves the inconvenience of having to plan my travels in advance, in order to get to my destination on time.	1	2	3	4	5	6	7

	Strongly Agree			Neutral			Strongly Disagree
20. Not drink-driving would make me feel secure and comfortable.	1	2	3	4	5	6	7
21. If I don't drink-drive, I have less risk of damaging my car.	1	2	3	4	5	6	7
22. Not drink-driving would mean that it takes longer to get to my destination (e.g. if I have to walk or catch public transport).	1	2	3	4	5	6	7
23. My friends influence my decision about whether or not to drink-drive.	1	2	3	4	5	6	7

SECTION THREE

For each of the following questions, you are asked how often you perform a particular behaviour in a particular circumstance. Please give your response as a percentage of the times you are in that circumstance, with a straight vertical line on the percentage scale given. You may place your vertical line anywhere along the scale to indicate any percentage.

1. When it would be desirable to drive, and you are under the influence of alcohol BUT NOT above the legal limit, how often would you drive?

|_____|_____|
0% of such occasions *50%* *100% of such occasions*

2. When it would be desirable to drive, but you are above the legal limit for alcohol, how often would you drive?

|_____|_____|
0% of such occasions *50%* *100% of such occasions*

3. When it would be desirable to drive, but you are above the legal limit for alcohol, AND you intend to drive only around local back streets, how often would you drive?

|_____|_____|
0% of such occasions *50%* *100% of such occasions*

4. When it would be desirable to drive, but you are above the legal limit, AND you will be driving only when it is very late at night or very early in the morning, how often would you drive?

|_____|_____|
0% of such occasions *50%* *100% of such occasions*

SECTION FOUR

Please read the following statements and circle one of the response options, indicating your level of agreement with each item. You may circle any of the 6 numbers below.

	disagree strongly	disagree somewhat	disagree slightly	agree slightly	agree somewhat	agree strongly
13. Obedience and respect for authority are the most important virtues people should learn.	1	2	3	4	5	6
14. What we need least is an authority to tell us what to do or how to do it.	1	2	3	4	5	6
15. Every person should have complete faith in some supernatural power, whose decisions must be obeyed without question.	1	2	3	4	5	6
16. No principle is more immoral than that of obedience.	1	2	3	4	5	6
17. Obedience is the mother of success.	1	2	3	4	5	6
18. Strong discipline builds moral character.	1	2	3	4	5	6
19. Obedience is the mother of enslavement.	1	2	3	4	5	6
20. True morality only develops in a fully permissive environment.	1	2	3	4	5	6
21. No principle is more noble or holy than that of true obedience.	1	2	3	4	5	6
22. Obedience and respect for authority aren't virtues and shouldn't be taught to children.	1	2	3	4	5	6
23. To be a decent person, always stay within the law.	1	2	3	4	5	6
24. Faith in the supernatural is a harmful self-delusion, and submission to religious authority is dangerous.	1	2	3	4	5	6

SECTION FIVE

1. In the past 2 years, how many times have you been fined for any traffic infringements (other than parking fines)? NEVER / ___times
   (Please circle 'Never' or indicate the number of fines) ***(If 'NEVER', go to Q.3 below)***

2. In the past 2 years, how many times have you been fined for drink-driving?
   NEVER / ___times
   (Please circle 'Never' or indicate the number of fines)

3. In the past 2 years, how many times have you been involved in a crash of any type (including crashes with pedestrians and stationary objects, etc.) while you were driving? NEVER / ___times
   (Please circle 'Never' or indicate the number of crashes) ***(If 'NEVER', go to Section 8)***

4. Of these crashes, how many would be a result of drink-driving? _____

SECTION SIX

For each of the following statements, please indicate whether they are true or false. Please circle either "T" (for true) or "F" (for false) for each of the statements.

1.	It is sometimes hard for me to go on with my work if I am not encouraged.	T	F
2.	I sometimes feel resentful when I don't get my way.	T	F
3.	On a few occasions, I have given up doing something because I thought too little of my ability.	T	F
4.	There have been times when I felt like rebelling against people in authority even though I knew they were right.	T	F
5.	No matter whom I'm talking to, I'm always a good listener.	T	F
6.	There have been occasions when I took advantage of someone.	T	F
7.	I'm always willing to admit it when I make a mistake.	T	F
8.	I sometimes try to get even rather than forgive and forget.	T	F
9.	I am always courteous, even to people who are disagreeable.	T	F
10.	I have never been annoyed when people expressed ideas very different from my own.	T	F
11.	There have been times when I was quite jealous of the good fortune of others.	T	F
12.	I am sometimes irritated by people who ask favours of me.	T	F
13.	I have never deliberately said something that hurt someone's feelings.	T	F

SECTION SEVEN

Please read the following list of statements and assess how appropriate they are of yourself and situations in your life. Please circle the number that corresponds to your assessment for each statement, using the following scale as a guide. You may circle any of the 7 numbers below.

		Never or Definitely not			Neutral			Always or Definitely
1.	Slow doing things	1	2	3	4	5	6	7
2.	Pressed for time	1	2	3	4	5	6	7
3.	Work is slow and deliberate	1	2	3	4	5	6	7
4.	Go "all out"	1	2	3	4	5	6	7
5.	Need to excel	1	2	3	4	5	6	7
6.	Bossy or dominating	1	2	3	4	5	6	7
7.	Never in a rush	1	2	3	4	5	6	7
8.	Dangerous and competitive driving	1	2	3	4	5	6	7
9.	Work slowly	1	2	3	4	5	6	7
10.	Do things in a hurry	1	2	3	4	5	6	7
11.	Ambitious	1	2	3	4	5	6	7
12.	Others rate me as easy going	1	2	3	4	5	6	7
13.	Work fast	1	2	3	4	5	6	7
14.	In a hurry	1	2	3	4	5	6	7
15.	Work quickly and energetically	1	2	3	4	5	6	7
16.	Consider myself as easy going	1	2	3	4	5	6	7

SECTION EIGHT

Each of the items below contains two choices, A and B. Please indicate the statement which best describes your likes or the way you feel, by circling either A or B. If you do not like either statement, choose the one you dislike least. Please circle one statement for each question, and do not leave any items blank.

1. A. I often wish I could be a mountain climber.
   B. I can't understand people who risk their necks climbing mountains.

2. A. A sensible person avoids activities that are dangerous.
   B. I sometimes like to do things that are a little frightening.

3. A. I would like to take up the sport of water skiing.
   B. I would not like to take up water skiing.

4. A. I would like to try surfing.
   B. I would not like to try surfing.

5. A. I would not like to learn to fly an airplane.
   B. I would like to learn to fly an airplane.

6. A. I prefer the surface of the water to the depths.
   B. I would like to go scuba diving

7. A. I would like to try skydiving.
   B. I would never want to try jumping out of a plane, with or without a parachute.

8. A. I like to dive off the high board.
   B. I don't like the feeling I get standing on the high board (or I don't go near it at all).

9. A. Sailing long distances in small sailing crafts is foolish.
   B. I would like to sail a long distance in a small but seaworthy sailing craft.

10. A. Skiing down a high mountain slope is a good way to end up on crutches.
    B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

SECTION NINE

Imagine that each of the situations below is actually happening to you, then rate the amount of anger you would feel, by circling any one of the 5 response options below.

	Not at all	A little	Some	Much	Very much
1. Someone is weaving in and out of traffic.	1	2	3	4	5
2. A slow vehicle on a mountain road will not pull over and let people by.	1	2	3	4	5
3. Someone backs right in front of you without looking.	1	2	3	4	5
4. You are stuck in a traffic jam.	1	2	3	4	5
5. Someone honks at you about your driving.	1	2	3	4	5
6. A police officer pulls you over.	1	2	3	4	5

SECTION TEN

Please rate the severity of the following circumstances, in terms of the impact they would have in your life, by circling one of the response options. You may circle any of the 7 numbers below.

	Extremely severe			Average severity			Not severe at all
How severe are the consequences of DRINK-DRIVING, in terms of the FINES you would receive?	1	2	3	4	5	6	7
How severe are the consequences of DRINK-DRIVING, in terms of the POINTS you would lose?	1	2	3	4	5	6	7
How severe are the consequences of DRINK-DRIVING, in terms of the INJURIES you would receive?	1	2	3	4	5	6	7

SECTION ELEVEN

1. Are you male or female (please circle)? Male / Female

2. How old were you at your last birthday (in years)? _____

3. What is the main language spoken at your home? _____

4. What is your postcode? _____

5. What is the status of you driver's licence (please circle)?
   (1) Learners (2) Red P (3) Green P (4) Ordinary (5) Silver (6) Gold

6. How long have you held a driver's licence (including L-plates)? ___yrs, ___mths

APPENDIX F: COMPLETE VERSION OF THE "DRIVING WHILE FATIGUED" RISKY DRIVING QUESTIONNAIRE

THE UNIVERSITY OF NEW SOUTH WALES

IRMRC

NSW Injury Risk Management Research Centre
The University of New South Wales

Thank you for consenting to participate in this survey. The survey is anonymous, and will take approximately 10 minutes to complete. Please do not write your name on the questionnaire. For all questions, please answer as accurately and honestly as possible. If you have any concerns or queries you may call **Ralston Fernandes at the University of New South Wales, on 9385 5354** or the **UNSW Ethics Secretariat on 9385 4234**.

SECTION ONE

Compared to the average driver of your age and gender, how would you rate the following? (Please circle your response)

		Much lower than average	Lower than average	Same as average	Higher than average	Much higher than average
a)	Your chances of staying healthy during next winter?	1	2	3	4	5
b)	Your chances of being fined while driving?	1	2	3	4	5
c)	Your chances of being injured in a road crash while driving within the next 2 years?	1	2	3	4	5
d)	Your chances of developing cancer?	1	2	3	4	5
e)	Your chances of being fined for driving while fatigued?	1	2	3	4	5
f)	Your chances of being injured in a road crash while you are driving while fatigued?	1	2	3	4	5

SECTION TWO

Please rate the extent to which you agree or disagree with each of the following statements, by circling any one of the 7 response options below.

		Strongly Agree			Neutral			Strongly Disagree
1.	Having a car crash would result in serious injuries that would interfere with my life.	1	2	3	4	5	6	7
2.	Losing my license would interfere significantly with my social life / leisure activities.	1	2	3	4	5	6	7
3.	My driving style makes it likely that I will be caught by the police.	1	2	3	4	5	6	7
4.	Getting a fine would make it financially very difficult for me to get through the month.	1	2	3	4	5	6	7
5.	Losing my license would interfere significantly with my work.	1	2	3	4	5	6	7
6.	Being injured in a car crash would cause significant problems in my life.	1	2	3	4	5	6	7
7.	My chances of having a car crash are very small.	1	2	3	4	5	6	7
8.	If I drive while fatigued, it increases my chances of having a car crash.	1	2	3	4	5	6	7
9.	Taking a break to avoid driving while fatigued would mean I can stretch my legs and refresh myself.	1	2	3	4	5	6	7
10.	Taking a break to avoid driving while fatigued would mean that it takes longer to get to my destination.	1	2	3	4	5	6	7
11.	Taking a break to avoid driving while fatigued would make me feel secure and comfortable.	1	2	3	4	5	6	7
12.	Taking a break to avoid driving while fatigued would involve the inconvenience of having to plan my travels in advance, in order to get to my destination on time.	1	2	3	4	5	6	7
13.	My chances of being fined for my driving are high.	1	2	3	4	5	6	7
14.	If I drive while fatigued, it increases my chances of being fined by police.	1	2	3	4	5	6	7
15.	Taking a break to avoid driving while fatigued would allow me to get a free biscuit and coffee from the “Stop-Revive-Survive” roadside locations.	1	2	3	4	5	6	7
16.	Getting alternative transport to avoid driving while fatigued (e.g. getting a lift from a friend) has the benefit of saving me money on petrol consumption.	1	2	3	4	5	6	7
17.	Taking a break from driving, just because I feel fatigued, would make me frustrated.	1	2	3	4	5	6	7
18.	If I don’t drive while fatigued, I have less risk of damaging my car.	1	2	3	4	5	6	7
19.	There is a good possibility that I will lose some points from my licence while driving.	1	2	3	4	5	6	7

	Strongly Agree			Neutral			Strongly Disagree
20. If I drive while fatigued, it increases my chances of losing some points from my licence.	1	2	3	4	5	6	7
21. Not driving while fatigued would allow me to avoid disapproval from my parents.	1	2	3	4	5	6	7
22. Taking a break to avoid driving while fatigued would mean that people don't think I'm a negligent or dangerous driver.	1	2	3	4	5	6	7
23. Taking a break to avoid driving while fatigued would mean that I miss out on the excitement of driving while fatigued.	1	2	3	4	5	6	7
24. Taking a break to avoid driving while fatigued would mean that my friends might think I'm gutless.	1	2	3	4	5	6	7
25. Taking a break to avoid driving while fatigued would give me a chance to go to the toilet.	1	2	3	4	5	6	7
26. My friends influence my decision about whether or not to drive while fatigued.	1	2	3	4	5	6	7

SECTION THREE

For each of the following questions, you are asked how often you perform a particular behaviour in a particular circumstance. Please give your response as a percentage of the times you are in that circumstance, with a straight vertical line on the percentage scale given. You may place your vertical line anywhere along the scale to indicate any percentage.

1. When it would be desirable to drive after sleeping less than 5 hrs, how often would you drive for 1 hr or more?

   |_____|_____|

   0% of such occasions *50%* *100% of such occasions*

2. When it would be desirable to drive for 3 hrs, how often would you do that drive without a break?

   |_____|_____|

   0% of such occasions *50%* *100% of such occasions*

3. When you are driving, and aware you feel fatigued, how often would you keep on driving?

   |_____|_____|

   0% of such occasions *50%* *100% of such occasions*

4. When driving while fatigued, and there is nowhere to stop except the side of the road, how often would you keep on driving?

   |_____|_____|

   0% of such occasions *50%* *100% of such occasions*

SECTION FOUR

Please read the following statements and circle one of the response options, indicating your level of agreement with each item. You may circle any of the 6 numbers below.

	disagree strongly	disagree somewhat	disagree slightly	agree slightly	agree somewhat	agree strongly
25. Obedience and respect for authority are the most important virtues people should learn.	1	2	3	4	5	6
26. What we need least is an authority to tell us what to do or how to do it.	1	2	3	4	5	6
27. Every person should have complete faith in some supernatural power, whose decisions must be obeyed without question.	1	2	3	4	5	6
28. No principle is more immoral than that of obedience.	1	2	3	4	5	6
29. Obedience is the mother of success.	1	2	3	4	5	6
30. Strong discipline builds moral character.	1	2	3	4	5	6
31. Obedience is the mother of enslavement.	1	2	3	4	5	6
32. True morality only develops in a fully permissive environment.	1	2	3	4	5	6
33. No principle is more noble or holy than that of true obedience.	1	2	3	4	5	6
34. Obedience and respect for authority aren't virtues and shouldn't be taught to children.	1	2	3	4	5	6
35. To be a decent person, always stay within the law.	1	2	3	4	5	6
36. Faith in the supernatural is a harmful self-delusion, and submission to religious authority is dangerous.	1	2	3	4	5	6

SECTION FIVE

1. In the past 2 years, how many times have you been fined for any traffic infringements (other than parking fines)? NEVER / ___times
   (Please circle 'Never' or indicate the number of fines) ***(If 'NEVER', go to Q.3 below)***

2. In the past 2 years, how many times have you been fined for driving while fatigued?
   NEVER / ___times
   (Please circle 'Never' or indicate the number of fines)

3. In the past 2 years, how many times have you been involved in a crash of any type (including crashes with pedestrians and stationary objects, etc.) while you were driving? NEVER / ___times
   (Please circle 'Never' or indicate the number of crashes) ***(If 'NEVER', go to Section 8)***

4. Of these crashes, how many would be a result of driving while fatigued? _____

SECTION SIX

For each of the following statements, please indicate whether they are true or false. Please circle either "T" (for true) or "F" (for false) for each of the statements.

1.	It is sometimes hard for me to go on with my work if I am not encouraged.	T	F
2.	I sometimes feel resentful when I don't get my way.	T	F
3.	On a few occasions, I have given up doing something because I thought too little of my ability.	T	F
4.	There have been times when I felt like rebelling against people in authority even though I knew they were right.	T	F
5.	No matter whom I'm talking to, I'm always a good listener.	T	F
6.	There have been occasions when I took advantage of someone.	T	F
7.	I'm always willing to admit it when I make a mistake.	T	F
8.	I sometimes try to get even rather than forgive and forget.	T	F
9.	I am always courteous, even to people who are disagreeable.	T	F
10.	I have never been annoyed when people expressed ideas very different from my own.	T	F
11.	There have been times when I was quite jealous of the good fortune of others.	T	F
12.	I am sometimes irritated by people who ask favours of me.	T	F
13.	I have never deliberately said something that hurt someone's feelings.	T	F

SECTION SEVEN

Please read the following list of statements and assess how appropriate they are of yourself and situations in your life. Please circle the number that corresponds to your assessment for each statement, using the following scale as a guide. You may circle any of the 7 numbers below.

		Never or Definitely not			Neutral			Always or Definitely
1.	Slow doing things	1	2	3	4	5	6	7
2.	Pressed for time	1	2	3	4	5	6	7
3.	Work is slow and deliberate	1	2	3	4	5	6	7
4.	Go "all out"	1	2	3	4	5	6	7
5.	Need to excel	1	2	3	4	5	6	7
6.	Bossy or dominating	1	2	3	4	5	6	7
7.	Never in a rush	1	2	3	4	5	6	7
8.	Dangerous and competitive driving	1	2	3	4	5	6	7
9.	Work slowly	1	2	3	4	5	6	7
10.	Do things in a hurry	1	2	3	4	5	6	7
11.	Ambitious	1	2	3	4	5	6	7
12.	Others rate me as easy going	1	2	3	4	5	6	7
13.	Work fast	1	2	3	4	5	6	7
14.	In a hurry	1	2	3	4	5	6	7
15.	Work quickly and energetically	1	2	3	4	5	6	7
16.	Consider myself as easy going	1	2	3	4	5	6	7

SECTION EIGHT

Each of the items below contains two choices, A and B. Please indicate the statement which best describes your likes or the way you feel, by circling either A or B. If you do not like either statement, choose the one you dislike least. Please circle one statement for each question, and do not leave any items blank.

1. A. I often wish I could be a mountain climber.
   B. I can't understand people who risk their necks climbing mountains.

2. A. A sensible person avoids activities that are dangerous.
   B. I sometimes like to do things that are a little frightening.

3. A. I would like to take up the sport of water skiing.
   B. I would not like to take up water skiing.

4. A. I would like to try surfing.
   B. I would not like to try surfing.

5. A. I would not like to learn to fly an airplane.
   B. I would like to learn to fly an airplane.

6. A. I prefer the surface of the water to the depths.
   B. I would like to go scuba diving

7. A. I would like to try skydiving.
   B. I would never want to try jumping out of a plane, with or without a parachute.

8. A. I like to dive off the high board.
   B. I don't like the feeling I get standing on the high board (or I don't go near it at all).

9. A. Sailing long distances in small sailing crafts is foolish.
   B. I would like to sail a long distance in a small but seaworthy sailing craft.

10. A. Skiing down a high mountain slope is a good way to end up on crutches.
    B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

SECTION NINE

Imagine that each of the situations below is actually happening to you, then rate the amount of anger you would feel, by circling any one of the 5 response options below.

	Not at all	A little	Some	Much	Very much
1. Someone is weaving in and out of traffic.	1	2	3	4	5
2. A slow vehicle on a mountain road will not pull over and let people by.	1	2	3	4	5
3. Someone backs right in front of you without looking.	1	2	3	4	5
4. You are stuck in a traffic jam.	1	2	3	4	5
5. Someone honks at you about your driving.	1	2	3	4	5
6. A police officer pulls you over.	1	2	3	4	5

SECTION TEN

Please rate the severity of the following circumstances, in terms of the impact they would have in your life, by circling one of the response options. You may circle any of the 7 numbers below.

	Extremely severe			Average severity			Not severe at all
How severe are the consequences of DRIVING WHILE FATIGUED, in terms of the FINES you would receive?	1	2	3	4	5	6	7
How severe are the consequences of DRIVING WHILE FATIGUED, in terms of the POINTS you would lose?	1	2	3	4	5	6	7
How severe are the consequences of DRIVING WHILE FATIGUED, in terms of the INJURIES you would receive?	1	2	3	4	5	6	7

SECTION ELEVEN

1. Are you male or female (please circle)? Male / Female

2. How old were you at your last birthday (in years)? _____

3. What is the main language spoken at your home? _____

4. What is your postcode? _____

5. What is the status of you driver's licence (please circle)?
   (1) Learners (2) Red P (3) Green P (4) Ordinary (5) Silver (6) Gold

6. How long have you held a driver's licence (including L-plates)? ___yrs, ___mths

APPENDIX G: COMPLETE VERSION OF THE "NOT WEARING SEAT BELTS" RISKY DRIVING QUESTIONNAIRE

THE UNIVERSITY OF NEW SOUTH WALES

IRMRC

NSW Injury Risk Management Research Centre
The University of New South Wales

Thank you for consenting to participate in this survey. The survey is anonymous, and will take approximately 10 minutes to complete. Please do not write your name on the questionnaire. For all questions, please answer as accurately and honestly as possible. If you have any concerns or queries you may call **Ralston Fernandes at the University of New South Wales, on 9385 5354** or the **UNSW Ethics Secretariat on 9385 4234**.

SECTION ONE

Compared to the average driver of your age and gender, how would you rate the following? (Please circle your response)

		Much lower than average	Lower than average	Same as average	Higher than average	Much higher than average
a)	Your chances of staying healthy during next winter?	1	2	3	4	5
b)	Your chances of being fined while driving?	1	2	3	4	5
c)	Your chances of being injured in a road crash while driving within the next 2 years?	1	2	3	4	5
d)	Your chances of developing cancer?	1	2	3	4	5
e)	Your chances of being fined for not wearing a seat belt?	1	2	3	4	5
f)	Your chances of being injured in a road crash while you are not wearing a seat belt?	1	2	3	4	5

SECTION TWO

Please rate the extent to which you agree or disagree with each of the following statements, by circling any one of the 7 response options below.

	Strongly Agree			Neutral			Strongly Disagree
1. Having a car crash would result in serious injuries that would interfere with my life.	1	2	3	4	5	6	7
2. Losing my license would interfere significantly with my social life / leisure activities.	1	2	3	4	5	6	7
3. My driving style makes it likely that I will be caught by the police.	1	2	3	4	5	6	7
4. Getting a fine would make it financially very difficult for me to get through the month.	1	2	3	4	5	6	7
5. Losing my license would interfere significantly with my work.	1	2	3	4	5	6	7
6. Being injured in a car crash would cause significant problems in my life.	1	2	3	4	5	6	7
7. My chances of having a car crash are very small.	1	2	3	4	5	6	7
8. If I don't wear a seat belt while driving, it increases my chances of having a car crash.	1	2	3	4	5	6	7
9. Wearing a seat belt while driving would allow me to avoid disapproval from my parents.	1	2	3	4	5	6	7
10. Not wearing a seat belt means the driver could get fined, so people would think I'm a bad person for not wearing one.	1	2	3	4	5	6	7
11. Wearing a seat belt while driving would mean that my friends might think I'm gutless.	1	2	3	4	5	6	7
12. My chances of being fined for my driving are high.	1	2	3	4	5	6	7
13. If I don't wear a seat belt while driving, it increases my chances of being fined by the police.	1	2	3	4	5	6	7
14. Wearing a seat belt does not allow me the freedom to move around in my seat.	1	2	3	4	5	6	7
15. Because I'm so used to putting a seat belt on, it would almost be a hassle not to wear one.	1	2	3	4	5	6	7
16. Wearing a seat belt would mean that I miss out on the excitement of not wearing one.	1	2	3	4	5	6	7
17. There is a good possibility that I will lose some points from my licence while driving.	1	2	3	4	5	6	7

	Strongly Agree			Neutral			Strongly Disagree
18. If I don't wear a seat belt while driving, it increases my chances of losing some points from my licence.	1	2	3	4	5	6	7
19. I find seat belts uncomfortable to wear.	1	2	3	4	5	6	7
20. Wearing a seat belt while driving would make me feel secure.	1	2	3	4	5	6	7
21. Wearing a seat belt while driving would mean that I don't have to listen to the "seat belt warning beep" in the car.	1	2	3	4	5	6	7
22. Putting on a seat belt when driving would mean that it takes longer to get to my destination.	1	2	3	4	5	6	7
23. My friends influence my decision about whether or not to wear a seat belt.	1	2	3	4	5	6	7

SECTION THREE

For each of the following questions, you are asked how often you perform a particular behaviour in a particular circumstance. Please give your response as a percentage of the times you are in that circumstance, with a straight vertical line on the percentage scale given. You may place your vertical line anywhere along the scale to indicate any percentage.

1. If you are the DRIVER of the car, and are driving in HEAVY traffic, how often would you use the seat belt?

|_____|_____|
0% of such occasions *50%* *100% of such occasions*

2. If you are the DRIVER of the car, and are driving in LITTLE traffic, how often would you use the seat belt?

|_____|_____|
0% of such occasions *50%* *100% of such occasions*

3. If you are a PASSENGER in the car, and are driving in HEAVY traffic, how often would you use the seat belt?

|_____|_____|
0% of such occasions *50%* *100% of such occasions*

4. If you are a PASSENGER in the car, and are driving in LITTLE traffic, how often would you use the seat belt?

|_____|_____|
0% of such occasions *50%* *100% of such occasions*

SECTION FOUR

Please read the following statements and circle one of the response options, indicating your level of agreement with each item. You may circle any of the 6 numbers below.

	disagree strongly	disagree somewhat	disagree slightly	agree slightly	agree somewhat	agree strongly
37. Obedience and respect for authority are the most important virtues people should learn.	1	2	3	4	5	6
38. What we need least is an authority to tell us what to do or how to do it.	1	2	3	4	5	6
39. Every person should have complete faith in some supernatural power, whose decisions must be obeyed without question.	1	2	3	4	5	6
40. No principle is more immoral than that of obedience.	1	2	3	4	5	6
41. Obedience is the mother of success.	1	2	3	4	5	6
42. Strong discipline builds moral character.	1	2	3	4	5	6
43. Obedience is the mother of enslavement.	1	2	3	4	5	6
44. True morality only develops in a fully permissive environment.	1	2	3	4	5	6
45. No principle is more noble or holy than that of true obedience.	1	2	3	4	5	6
46. Obedience and respect for authority aren't virtues and shouldn't be taught to children.	1	2	3	4	5	6
47. To be a decent person, always stay within the law.	1	2	3	4	5	6
48. Faith in the supernatural is a harmful self-delusion, and submission to religious authority is dangerous.	1	2	3	4	5	6

SECTION FIVE

1. In the past 2 years, how many times have you been fined for any traffic infringements (other than parking fines)? NEVER / ___times
   (Please circle 'Never' or indicate the number of fines) ***(If 'NEVER', go to Q.3 below)***

2. In the past 2 years, how many times have you been fined for not wearing a seat belt?
   NEVER / ___times
   (Please circle 'Never' or indicate the number of fines)

3. In the past 2 years, how many times have you been involved in a crash of any type (including crashes with pedestrians and stationary objects, etc.) while you were driving? NEVER / ___times
   (Please circle 'Never' or indicate the number of crashes) ***(If 'NEVER', go to Section 8)***

SECTION SIX

For each of the following statements, please indicate whether they are true or false. Please circle either "T" (for true) or "F" (for false) for each of the statements.

1.	It is sometimes hard for me to go on with my work if I am not encouraged.	T	F
2.	I sometimes feel resentful when I don't get my way.	T	F
3.	On a few occasions, I have given up doing something because I thought too little of my ability.	T	F
4.	There have been times when I felt like rebelling against people in authority even though I knew they were right.	T	F
5.	No matter whom I'm talking to, I'm always a good listener.	T	F
6.	There have been occasions when I took advantage of someone.	T	F
7.	I'm always willing to admit it when I make a mistake.	T	F
8.	I sometimes try to get even rather than forgive and forget.	T	F
9.	I am always courteous, even to people who are disagreeable.	T	F
10.	I have never been annoyed when people expressed ideas very different from my own.	T	F
11.	There have been times when I was quite jealous of the good fortune of others.	T	F
12.	I am sometimes irritated by people who ask favours of me.	T	F
13.	I have never deliberately said something that hurt someone's feelings.	T	F

SECTION SEVEN

Please read the following list of statements and assess how appropriate they are of yourself and situations in your life. Please circle the number that corresponds to your assessment for each statement, using the following scale as a guide. You may circle any of the 7 numbers below.

		Never or Definitely not			Neutral			Always or Definitely
1.	Slow doing things	1	2	3	4	5	6	7
2.	Pressed for time	1	2	3	4	5	6	7
3.	Work is slow and deliberate	1	2	3	4	5	6	7
4.	Go "all out"	1	2	3	4	5	6	7
5.	Need to excel	1	2	3	4	5	6	7
6.	Bossy or dominating	1	2	3	4	5	6	7
7.	Never in a rush	1	2	3	4	5	6	7
8.	Dangerous and competitive driving	1	2	3	4	5	6	7
9.	Work slowly	1	2	3	4	5	6	7
10.	Do things in a hurry	1	2	3	4	5	6	7
11.	Ambitious	1	2	3	4	5	6	7
12.	Others rate me as easy going	1	2	3	4	5	6	7
13.	Work fast	1	2	3	4	5	6	7
14.	In a hurry	1	2	3	4	5	6	7
15.	Work quickly and energetically	1	2	3	4	5	6	7
16.	Consider myself as easy going	1	2	3	4	5	6	7

SECTION EIGHT

Each of the items below contains two choices, A and B. Please indicate the statement which best describes your likes or the way you feel, by circling either A or B. If you do not like either statement, choose the one you dislike least. Please circle one statement for each question, and do not leave any items blank.

1. A. I often wish I could be a mountain climber.
   B. I can't understand people who risk their necks climbing mountains.

2. A. A sensible person avoids activities that are dangerous.
   B. I sometimes like to do things that are a little frightening.

3. A. I would like to take up the sport of water skiing.
   B. I would not like to take up water skiing.

4. A. I would like to try surfing.
   B. I would not like to try surfing.

5. A. I would not like to learn to fly an airplane.
   B. I would like to learn to fly an airplane.

6. A. I prefer the surface of the water to the depths.
   B. I would like to go scuba diving

7. A. I would like to try skydiving.
   B. I would never want to try jumping out of a plane, with or without a parachute.

8. A. I like to dive off the high board.
   B. I don't like the feeling I get standing on the high board (or I don't go near it at all).

9. A. Sailing long distances in small sailing crafts is foolish.
   B. I would like to sail a long distance in a small but seaworthy sailing craft.

10. A. Skiing down a high mountain slope is a good way to end up on crutches.
    B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

SECTION NINE

Imagine that each of the situations below is actually happening to you, then rate the amount of anger you would feel, by circling any one of the 5 response options below.

	Not at all	A little	Some	Much	Very much
1. Someone is weaving in and out of traffic.	1	2	3	4	5
2. A slow vehicle on a mountain road will not pull over and let people by.	1	2	3	4	5
3. Someone backs right in front of you without looking.	1	2	3	4	5
4. You are stuck in a traffic jam.	1	2	3	4	5
5. Someone honks at you about your driving.	1	2	3	4	5
6. A police officer pulls you over.	1	2	3	4	5

SECTION TEN

Please rate the severity of the following circumstances, in terms of the impact they would have in your life, by circling one of the response options. You may circle any of the 7 numbers below.

	Extremely severe			Average severity			Not severe at all
How severe are the consequences of NOT WEARING A SEAT BELT while driving, in terms of the FINES you would receive?	1	2	3	4	5	6	7
How severe are the consequences of NOT WEARING A SEAT BELT while driving, in terms of the POINTS you would lose?	1	2	3	4	5	6	7
How severe are the consequences of NOT WEARING A SEAT BELT while driving, in terms of the INJURIES you would receive?	1	2	3	4	5	6	7

SECTION ELEVEN

1. Are you male or female (please circle)? Male / Female

2. How old were you at your last birthday (in years)? _____

3. What is the main language spoken at your home? _____

4. What is your postcode? _____

5. What is the status of you driver's licence (please circle)?
   (1) Learners (2) Red P (3) Green P (4) Ordinary (5) Silver (6) Gold

6. How long have you held a driver's licence (including L-plates)? ___yrs, ___mths

APPENDIX H: COMPLETE SCALE CONSTRUCTION DATA ANALYSES FOR ALL RISKY DRIVING QUESTIONNAIRE SCALES IN STUDY 3

Illusory Invulnerability scales

Three illusory invulnerability scales were constructed for each behaviour – **road-unrelated illusory invulnerability, road-related general illusory invulnerability, and road-related specific illusory invulnerability** – with each scale comprising of two items. A factor analysis with all six illusory invulnerability items was undertaken for each behaviour. As expected, factor analysis revealed a three-factor structure for speeding; however, a two-factor structure was found for drink-driving, not wearing seat belts and driving while fatigued. Table 48 shows the item correlations for all illusory invulnerability scales constructed for each of the four behaviours in Study 3. Item correlations were satisfactory for all road-related specific illusory invulnerability scales, but low to moderate (and sometimes not statistically significant) for road-unrelated illusory invulnerability and road-related general illusory invulnerability scales.

Table 48: Item correlations for all road-related specific, road-related general, and road-unrelated illusory invulnerability scales in Study 3, for each questionnaire version. [14]

	"Drink-driving" version	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**	**"Speeding" version**
α (road-related specific)	0.50**	0.85**	0.83**	0.39*
α (road-related general)	0.17	0.13	0.45**	-0.01
α (road-unrelated)	0.28	0.41*	0.41*	0.04

** Correlation is significant at the 0.001 level (2-tailed).

Perceived Severity scales

For specific perceived severity scales, for all four behaviours, factor analyses revealed that the relevant items assessed one factor. For general perceived severity scales, factor analyses revealed either a two-factor structure (for drink-driving and speeding) or three-factor structure (for not wearing seat belts and driving while fatigued). Table 49 shows Cronbach's Alpha for all perceived severity scales constructed for each of the four behaviours in Study 3. Reliability levels were acceptable for all perceived severity scales constructed, except for general perceived severity scales for driving while fatigued and not wearing seat belts.

Table 49: Cronbach's Alpha reliability levels for all general perceived severity and general specific severity scales in Study 3, for each questionnaire version. [15]

	"Drink-driving" version	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**	**"Speeding" version**
α (general severity)	0.71	0.38	0.38	0.76

[14] Road-unrelated and road-related general illusory invulnerability questions were the same for all behaviours. Different correlation values reflect the fact that different participants completed different questionnaire versions.

[15] General perceived severity questions were the same for all behaviours. Different Cronbach's Alpha values reflect the fact that different participants completed different questionnaire versions.

α (specific severity)	0.87	0.58	0.75	0.73

Perceived Susceptibility scales

For specific perceived susceptibility scales, factor analyses revealed either a one-factor structure (for not wearing seat belts and speeding) or two-factor structure (for drink-driving and driving while fatigued). For general perceived susceptibility scales, factor analyses revealed either a one-factor structure (for drink-driving and speeding) or two-factor structure (for not wearing seat belts and driving while fatigued). Table 50 shows Cronbach's Alpha for all perceived susceptibility scales constructed for each of the four behaviours in Study 3. Reliability levels for perceived susceptibility scales were generally low to moderate.

Table 50: Cronbach's Alpha for all general perceived susceptibility and general specific susceptibility scales in Study 3, for each questionnaire version. [16]

	"Drink-driving" version	**"Driving While Fatigued" version**	**"Not Wearing Seat belts" version**	**"Speeding" version**
α (general susceptibility)	0.77	0.27	0.42	0.73
α (specific susceptibility)	0.40	0.55	-0.34	0.37

Perceived Benefits scales

Factor analyses revealed either a two-factor structure (for drink-driving and speeding) or three-factor structure (for not wearing seat belts and driving while fatigued). Cronbach's Alpha reliability levels were acceptable for speeding (α=0.68), but were low for not wearing seat belts, drink-driving and driving while fatigued (α=0.41, 0.30 and 0.47 respectively).

Perceived Costs scales

Factor analyses revealed either a two-factor structure (for drink-driving, driving while fatigued and speeding) or three-factor structure (for not wearing seat belts). Cronbach's Alpha reliability levels were acceptable for speeding (α=0.64), but were low for not wearing seat belts, drink-driving and driving while fatigued (α=0.19, 0.20 and 0.42 respectively).

Behavioural intentions scales

For each of the four behaviours, factor analyses revealed that the relevant items assessed one factor. Cronbach's Alpha reliability levels were satisfactory for all behaviours (α=0.90, 0.89, 0.85, and 0.67), with drink-driving exhibiting the lowest reliability level (α=0.67).

Personality scales

Original instructions for the scoring of the Authority-Rebellion, Time Urgency, and Sensation Seeking personality scales, as well as the Marlowe-Crowne Social Desirability scale, were followed. For driver anger, factor analyses revealed either a one-factor structure (for drink-driving, driving while fatigued and speeding) or two-factor structure (for not wearing seat belts). Cronbach's Alpha reliability levels were acceptable for speeding, drink-driving, not wearing seat belts, and driving while fatigued (α=0.85, 0.86, 0.83, and 0.81, respectively).

[16] General perceived susceptibility questions were the same for all behaviours. Different Cronbach's Alpha values reflect the fact that different participants completed different questionnaire versions.