Reducing Optimism Bias in Young Novice Drivers: The Potential of Accountability or Insight Experience Interventions

Final report to the NRMA-ACT Road Safety Trust and VicRoads

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Preface

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EXECUTIVE SUMMARY

BACKGROUND & OBJECTIVES

Optimism bias, or the tendency to perceive oneself as more skilled or at 'lower risk' than one's peers, has been shown to occur in a range of different situations related to health risk (Weinstein & Klein, 1995). Optimism bias is particularly pertinent to road safety, as personal risk and ability perceptions underlie safe or risky driving behaviours (e.g., Fernandes, Job & Hatfield, 2007). It has been consistently found that the majority of drivers consider themselves as being more skilled and less risky drivers (e.g., Harre, Foster & O'Neill, 2005) and less likely to be involved in a crash (Gosselin, Gagnon, Stinchcombe & Joanise, 2010) than the average driver or their peers.

Several researchers have found that optimism leads to feelings of invulnerability (e.g., McKenna, 1993). The feeling of invulnerability may lead to the driver being less motivated to engage in protective behaviours (Weinstein & Klein, 1995). Similarly, optimism bias has been associated with deliberate risky behaviours such as running red lights (Morgan & Job, 1995), failing to use indicators, drink driving and driving while fatigued (Fernandes et al., 2007). Hence, interventions reducing optimism bias may lead individuals to engage in less risk-taking and more protective driving behaviours.

Limited success has been found for interventions aimed at reducing driving-related optimism bias that can be broadly classified as insight-based and accountability-based interventions. Accountability interventions involve telling the driver that their own estimates of their driving skill and safety will subsequently be objectively assessed (Sedikides, Herst, Hardin, & Dardis, 2002). The anticipation of being evaluated, or being held accountable for their estimates, is associated with drivers providing lower estimates of their driving skill and safety than drivers who do not anticipate being evaluated (McKenna & Myers, 1997). We have used the term 'insight-based' interventions to refer to those interventions that aim to reduce driver's optimism bias by making them more aware of their limitations in difficult driving situations through experience with a difficult situation (e.g., Gregersen, 1996). While evidence is limited and conflicting for interventions aimed at reducing optimism bias, the most promising findings come from studies using these insight-based manipulations (e.g., Gregersen, 1996) and accountability manipulations (McKenna & Myers, 1997). The current research investigates the effectiveness of a novel insight-based intervention using a hazard perception task against a simulator-based accountability manipulation and no-intervention control condition as a means to reduce optimism bias both immediately and in the medium term, at a three-month follow up

The objectives of this project were:

1) To investigate whether novel computer-based accountability and insight interventions led to immediate reductions in driving-related optimism bias.

2) To investigate the immediate effect of insight and accountability interventions on driving-related attitudes.

3) To investigate whether any effects of accountability and insight interventions on optimism bias found immediately were sustained after three months and whether any new effects emerged.

4) To investigate whether any effects of accountability and insight interventions on driving-related attitudes found at Time 1 are sustained after three months and whether any new effects emerged over time.

METHOD

The two testing sessions were undertaken approximately three months apart. At Time 1, 242 participants were randomly allocated to an insight manipulation (n = 79), an accountability manipulation (n = 81) or a control condition (n = 82). Participants in the insight manipulation were required to complete a difficult hazard perception task before evaluating their driving skills, safety and accident risk. Participants in the accountability condition were required to complete the same questionnaire after first receiving the instruction that they would be objectively assessed on their driving skills, safety and accident risk in the driving simulator following questionnaire completion. Following the questionnaire, participants in the accountability condition were required to complete a driving simulation to increase the face validity (realism) of the manipulation, though no formal evaluation occurred. Participants in the control condition completed only the questionnaire and no intervention.

At Time 2, approximately three months after the initial testing sessions, approximately 94% (N = 227) of the initial sample completed an online questionnaire, reassessing their perceived skills, safety and accident risk to evaluate whether the interventions had any sustained or delayed effects.

RESULTS

Acute Time 1 Results

Accountability and insight interventions had no significant effects on driver's estimates of their driving skill, safety or accident risk across the entire young driver sample. However among less experienced drivers (more than 6 months, but less than 3.67 years of driving experience), those in the accountability condition (n = 38) showed less situation-specific accident-risk related optimism bias than those in the control condition (n = 46) or insight condition (n = 38), suggesting that the accountability intervention was effective at reducing specific accident risk perceptions among less experienced drivers. In contrast, among males with more driving experience, those in the insight condition (n = 17) actually showed more general accident risk-related optimism bias than those in the control condition (n = 11), suggesting that the insight condition actually had a negative effect on general accident risk-related optimism bias among more experienced male drivers When learner drivers were excluded from the analyses, among less experienced drivers, those in the accountability condition (n = 38) reported significantly more positive attitudes to fun-riding than their peers in the insight (n = 38) or control conditions (n = 46).

Final Results

Final analyses, based on 227 participants who completed valid questionnaires at both testing sessions (74 controls, 76 insight and 77 accountability), revealed that undergoing an insight or accountability intervention had no significant overall effects on any of the measures of optimism bias. There were three non-significant trends for the insight intervention to have differential effects on accident risk-related optimism bias among males with varying levels of experience. First, among less experienced males at Time 2 only, those in the insight condition reported lower specific safety estimates (lower optimism bias) than control participants.

Second, also among less experienced males, those in the insight condition gave higher estimates of accident risk (lower optimism bias) than control participants. However, among more experienced males, those in the insight condition gave lower estimates of general accident risk (more optimism bias) than controls. These trends tentatively suggest that the insight intervention may be effective at reducing some types of optimism bias among less experienced males, but may actually increase some types of optimism bias among more experienced males. However, as these trends were not significant, further research is needed in a larger sample of male drivers to clarify these effects.

There was only one significant effect of the interventions on driving-related attitudes whereby those in the insight condition (n = 76) reported significantly less concern for others compared to young drivers in the control condition (n = 74). Interestingly, when learners were excluded from the analyses (leaving 208 participants who completed both Time 1 and Time 2), three new effects on driving-related optimism bias and attitudes emerged. Firstly, among males with less experience (<3.67 years), those in the insight condition (n = 12) showed less general accident risk-related optimism bias than those in the control condition (n = 9). Secondly, among males with more experience, the insight manipulation (n = 16) was associated with greater optimism bias related to general accident risk compared to the accountability (n = 14) or control conditions (n = 16). Finally, among less experienced (though non-Learner) drivers, at Time 1 only, participants in the accountability condition reported more favourable attitudes toward fun-riding compared with those drivers in the control and insight conditions.

KEY FINDINGS, POLICY IMPLICATIONS & FUTURE RESEARCH

The key findings from the present study include:

- Acute Time 1 analyses (N = 242) revealed that among less experienced drivers (with 6 months to 3.67 years of driving experience), those in the accountability intervention (n = 38) reported less accident risk-related optimism bias than did those in the control (n = 46) or insight (n = 38) conditions.
- Acute Time 1 analyses also revealed that among more experienced (3.67 – 10 years of experience) male drivers, those in the insight intervention (n = 17) actually showed more situation-specific accident risk related optimism bias than did their counterparts in the control group (n = 11).
- Final analyses, based on a slightly smaller sample of 227 participants who completed both Time 1 and Time 2 testing, revealed that participants in the insight condition (n = 76) showed significantly less concern for other road users than did participants in the control condition (n = 74).
- Final analyses (based on 227 participants who participated in both testing sessions), revealed three non-significant trends involving male drivers of differing experience levels and the insight intervention.
    - At Time 2 only, among less experienced males, those in the insight condition reported lower specific safety estimates than controls.
    - Among less experienced males, those in the insight condition gave higher estimates of general accident risk (less optimism bias) than controls.
    - Among more experienced males, those in the insight condition gave lower estimates of general accident risk (more optimism bias) than controls.
- When learners were excluded from the analysis, one new effect emerged at Time 1 and three new effects emerged at Time 2.
    - Acute findings from Time 1 found that those in the accountability condition reported more positive attitudes to fun-riding than those in the control condition.

- Analyses of Time 1 and 2 revealed that among less experienced males, those in the insight condition (n = 12) showed less general accident risk related optimism bias than their counterparts in the control condition (n = 9).
- Final analyses found that more experienced males in the insight intervention (n = 16) showed more general accident risk-related optimism bias than their counterparts in the accountability (n = 14) or control (n = 16) conditions.
- Final analyses revealed that among less experienced drivers, those in the accountability condition reported more favourable attitudes to fun-riding compared to participants in the control and insight conditions (consistent with acute Time 1 findings).

Policy implications that arise from these findings:

- The current findings do not support the inclusion of accountability or insight-based manipulations into government policy relating to young novice drivers for the purpose of reducing driving-related optimism bias in this population.
- The finding that the accountability intervention immediately reduced specific accident risk related optimism bias among less experienced (6 months to 3.67 years of driving experience) young drivers suggests that there may be potential for this type of intervention to be directed at inexperienced drivers in the future. However, the effect of the accountability intervention among inexperienced drivers was not sustained at three-month follow up. The accountability intervention would need to be modified so that it achieves a sustained effect before it could be implemented as an effective countermeasure for optimism bias.
- The findings that the insight intervention actually increased accident risk related optimism bias among more experienced (3.67 to 10 years of driving experience) male drivers and decreased concern for others among the full sample of young drivers suggests that such interventions should be used with caution, especially among more experienced males. Future research should also investigate which elements of the insight task contributed to increased optimism bias in some subgroups of the sample and less concern for others among the whole sample. Furthermore it should be investigated whether other types of hazard perception tasks, such as those used in current Australian graduated licensing systems (Senserrick & Whelan, 2003), may inadvertently act as insight tasks and increase optimism bias among more experienced males and/or decrease young drivers' concern for other drivers. It is recognised that the hazard perception tests used in graduated licensing programs are not applied in the same format or for the same purpose as the hazard perception task used in the present study. As such, these findings may not generalise to those jurisdictions' particular tests or applications. However, we believe it is valuable to recognise that hazard perception tests delivered in the same format as that used in the current insight manipulation may have negative effects on some subgroups of young drivers, in particular, more experienced male drivers. If it is found that hazard perception tests increase driving-related optimism bias among more experienced drivers, this may provide an argument that hazard perception tests should be administered prior to the driver obtaining three years of driving experience.
- Together, the current findings suggest that accountability and insight interventions may have differential effects in different subgroups of young drivers, highlighting the need for such interventions (and potentially more general interventions targeting young driver safety) to be targeted at specific subgroups of young drivers.

Future research is required in the following areas:

- Future research is required to clarify the effect of the insight manipulation (in particular, those using hazard perception tasks) on driving related optimism bias and attitudes, particularly in young male drivers of different experience levels.
- If current findings are replicated, further research should also establish whether the skill gain resulting from insight training using the hazard perception task as an insight device outweighs the potential negative effect of the hazard perception task on accident risk related optimism bias in some subgroups of young drivers. Depending on findings, the use of this type of hazard perception task in young driver groups should be monitored.
- Further research is required to determine whether brief accountability interventions could be effective when used in larger samples of less experienced drivers, as suggested by the current Time 1 results.
- Finally, the relationship between any reductions in optimism bias and consequent actual driving behaviour also requires further research.

1. INTRODUCTION

1.1. BACKGROUND

1.1.1. Road crashes, risk taking and risk perception in young novice drivers

Young drivers are consistently identified as a particularly high-risk group of road users. Road accidents are the most common cause of death among those aged under 25 in the USA, Canada, European Union (Clarke, Ward, & Truman, 2005) and Australia (Australian Bureau of Statistics, 2008). Between 2004 and 2006, transport accidents were the leading cause of death for both Australian young men and women aged 17 to 25, causing 33.5% of deaths in young men and 25.2% in young women (ABS, 2008). Furthermore, young drivers have three to four times more accidents per year than older drivers (Clarke et al., 2005), and are twice as likely to suffer a serious road crash injury compared to all other age groups (Department of Infrastructure, 2004). It is recognised that a certain percentage of crashes involving young people (particularly those aged less than 21) may be due to inexperience and unintentional errors. However, research suggests that many young drivers also engage in deliberate risky behaviour that contributes to crashes. One study found that 50% of crashes could be cumulatively accounted for by deliberate risk-taking behaviours, including speeding, drink-driving, driving recklessly, risky overtaking and following too closely (Clarke et al., 2005). Furthermore, specific groups of young drivers with above-average driving skills had a high rate of accident involvement because of intentional risky behaviour and decisions (Clarke et al., 2005).

Risk perception has been the target of national safety advertising campaigns in Australia and New Zealand. These campaigns often illustrate young novice driver stereotypes engaging in risky behaviour on the road, such as speeding, drink-driving, and failing to wear a seatbelt (Donovan, Jalleh, & Henley, 1999). However, several studies have found that while young drivers understand which behaviours are risky and rate their peer group as being a high risk group, they typically do not consider themselves personally susceptible to this risk (Finn & Bragg, 1986; Guerin, 1994; Harre et al., 2005). Furthermore, Tyler and Cook (1984) found that mass media communications on crime caused people to increase their judgements of societal risk, but not judgements of personal risk. A number of studies also suggest that the majority of drivers believe that compared to their average peer they take fewer road-related risks, drive more skilfully, and are less likely to be booked for traffic offences (Horswill, Waylen, & Tofield, 2004; McKenna, 1993; Svenson, 1981; Svenson, Fischhoff, & MacGregor, 1985). The tendency to believe that one is more skilled and less likely to experience a negative event than one's peers is known as optimism bias (Weinstein & Klein, 1995).

1.1.2 Optimism bias in young novice drivers

Optimism bias has been investigated in the context of road safety since the early 1980's. In one of the earliest studies of optimism bias Svenson (1981) found that 93% of US participants and 69% of Swedish participants rated themselves as more skilful than the average driver. Furthermore, half of all participants believed themselves to be among the safest 20% (US) or 30% (Sweden) of drivers in their group (Svenson, 1981). Since then, the finding that drivers consider themselves more skilled than their peers or the average driver has been replicated numerous times (Delhomme, 1991; Dalziel, 1997; Horswill et al., 2004). Delhomme (1991)

found that in a sample of drivers aged 18 to 90, 58% reported they had above average skill as a driver, 37% reported they were average and only 7% reported they had inferior skills compared to an average driver. More recently, Horswill et al. found that drivers rated themselves superior to both same-aged peers and the average driver on self-assessments of overall driving ability, as well as on 17 specific components of driving skill. Optimism bias has been found to be particularly pronounced in young drivers. For example, in a sample of drivers aged 18 to 24, 93% of males and 75% of females reported that they were more skilful as a driver than their peers (Dejoy, 1992). Similarly, Harre et al. (2005) found that participants in a sample of drivers aged 18 to 29 years rated themselves as being more skilled as a driver, having better reflexes and better judgment than other drivers their age.

Literature suggests that young drivers also perceive themselves to be more cautious and less likely to have a crash than their peers (Dejoy, 1992; Gosselin et al., 2010; Harre et al., 2005). Dejoy (1992) found that 72% of young male drivers and 71% of young female drivers in his sample rated themselves as safer and less likely to have a crash than their same aged and gendered peers. Furthermore, Harre et al. found that drivers aged 16 to 29 rated themselves as more skilled and less likely to crash relative to their average peer.

1.1.3. Effects of optimism bias on young drivers' behaviour and attitudes

While optimism bias may have adaptive significance for self-esteem, motivation and performance (Taylor & Brown, 1988), several researchers have argued that optimism bias may also foster a feeling of invulnerability (McKenna, 1993; Svenson, 1981). For example, Job, Hamer and Walker (1995) demonstrated that optimism bias resulted in fewer precautionary behaviours in a number of health-related contexts. Optimism bias has also been associated with engaging in fewer protective behaviours in the context of road safety. For example, Harre et al. (2005) found that the higher participants rated their driving-related skills and safety, the lower their perceived accident risk was. Lower risk perceptions and higher skill perceptions have been associated with drivers engaging in less protective behaviours and more deliberate risky driving behaviours. For example, Klein (1997) found that drivers who were told to imagine their crash risk was lower than their peers' became less likely to engage in self-protective behaviours, such as enrolling in a driver's education program, obeying the speed limit, having their vehicle inspected often, and wearing their seatbelt. Furthermore, optimism bias has also been found to be a significant predictor of risky driving behaviours such as red light running (Morgan & Job, 1995), not using indicators, drink driving and driving while fatigued (Fernandes et al., 2007).

1.1.4. Reducing optimism bias

Despite the potential harmful consequences of unrealistic optimism, there is limited evidence for the effectiveness of interventions aimed at reducing driving-related optimism bias. Some interventions (e.g., RRISK, Zask et al., 2006) have found evidence of short-term success at reducing young drivers' risky behaviours and changing attitudes to risky behaviours and situations. However, few have found conclusive support for effective ways to reduce optimism bias. Unsuccessful interventions have failed to reduce, and in some cases, exacerbated optimism bias. For example, in a sample of university students, participants who were shown advertisements portraying dangerous driving resulting in a crash subsequently reported more driving-related optimism bias than participants shown videos portraying people making safe decisions (Harre et al., 2005). It has been suggested that while drivers may agree with the message of such campaigns, they perceive the information as being relevant to other drivers and not to themselves (McKenna & Horswill, 2006; Svenson, 1981; Tyler & Cook, 1984). Interventions that include driver training have also been shown to exacerbate optimism bias

(Gregersen, 1996). Similarly, Weinstein and Klein (1995) unsuccessfully attempted to reduce health-related optimism bias by presenting participants with a list of risk factors for health problems and relating these risk factors to the participants. Other studies have aimed to reduce optimism bias by drawing drivers' attention to past negative driving experiences (Hatfield & Job, 2001; McKenna & Lewis, 1990). While some studies have found support for this approach (e.g., McKenna & Albery, 2001), young drivers may lack the necessary degree of driving experience upon which to reflect, limiting the relevance and effectiveness of manipulations that use negative driving experience. Furthermore, drivers may have optimism bias for negative driving events experienced in the past. That is, they may acknowledge they have experienced negative events, but perceive that they have experienced fewer negative events than others in their age group (Hatfield & Job, 2001).

One partially successful intervention involved asking drivers to imagine themselves in a severe, blameworthy accident (Falk & Montgomery, 2009; McKenna & Myers, 2001). In a sample of young men, those who were instructed to imagine a severe accident scenario and imagine the associated consequences and feelings showed more "ideal" (negative) attitudes to risky driving behaviour than control participants who were interviewed about neutral issues. At a four week follow-up, this effect was retained. However, participants who were instructed to imagine themselves in a severe, blameworthy accident did not differ from the control group on driving-related optimism bias. Hence, the intervention had no effect on such driving-related optimism bias (Falk & Montgomery, 2009).

Research provides some support for the effectiveness of accountability-based manipulations at reducing optimism bias in different contexts. Accountability-based interventions involve holding participants accountable for their skill and safety estimates by telling them that these estimates will later be objectively evaluated (Sedikides et al., 2002). A recent study found that when participants were asked to write and evaluate an essay, they gave more conservative estimates of their writing skill if they anticipated that their work would be identifiable and evaluated (Sedikides et al., 2002). These findings have been generalised to a road safety context. In one study, participants who were told their driving would be objectively assessed using a driving simulation task (accountability condition) rated themselves as less skilled and less cautious than participants who were not told they would be assessed. However, this accountability manipulation did not increase perceived accident likelihood (McKenna & Myers, 1997). Further research is required to replicate these findings and to establish whether accountability manipulations could be effective in increasing perceived accident likelihood, and also to examine whether any effectiveness is maintained for a period of time following the initial intervention.

Interventions that can be broadly classified as 'insight-based' have also shown limited effectiveness in reducing novice drivers' optimism bias, at least in the short-term, though the evidence is mixed depending on the particular application. Insight-based interventions involve participants completing a difficult task before providing estimates of their abilities and likely negative outcomes on tasks from the same context. It is expected that insight-based interventions make participants more aware of their own limitations in critical situations (i.e., increasing their insight into their own limitations and the difficulties of such tasks) by providing them with a difficult task to reflect on, hence reducing optimism bias (Gregersen, 1996). Gregersen compared two different training strategies aimed at reducing optimism bias in novice drivers. Learner drivers received either skill training alone (such as braking and avoidance manoeuvring) or both skill and insight training in which the driver was subjected to a difficult task that involved avoiding an obstacle. The insight training was designed to make the driver aware that his/her own driving skill in critical situations may be limited and

unpredictable. One week after training, the learner drivers completed a test of their estimated and actual skill. Although no difference in actual skill was observed, the drivers who received only skill training estimated their performance would be higher than the group who received insight training. More recently, one study found that a group of traffic offenders (aged 25-44) who underwent a two-day instructional based program reported lower levels of accident risk related optimism bias compared to a control group of traffic offenders who did not undergo the program (Perrissol et al., 2011). Further research is required to establish whether insight based training alone could effectively reduce optimism bias in the wider young driver population, and whether this can be done using a briefer, cheaper form that could be used routinely in licensing programs.

Training based interventions that provide drivers with knowledge and experience, particularly insight-based forms of training, have also been associated with positive outcomes in young drivers, such as decreased risky behaviours (McKenna, Horswill & Alexander, 2006) and increased hazard perception skills (Isler, Starkey & Williamson, 2009). Isler et al. (2009) found that drivers who were given the difficult task of verbally identifying hazards while watching driving scenarios improved their hazard perception skills and reaction times to hazards, compared to drivers who did not complete the tasks. However, it remains to be seen whether a difficult hazard perception task, such as that used by Isler et al. (2009), could be effective in reducing optimism bias in young drivers, rather than simply improving skill – particularly as optimism bias, and not skill, is theoretically related to intentional risk-taking driving behaviour (Gregersen, 1996). The investigators of the current study proposed that the difficult level and 'real-world' relevance of the driving scenarios used in this hazard perception task could potentially provide drivers with insight into their own limitations as a driver in the context of the challenging nature of driving with unexpected hazards, hence reducing driving-related optimism bias.

While some support has been found for the potential of accountability and insight-based interventions in reducing optimism bias in relation to perceived skills and safety, further research is required to determine whether these interventions are also effective in reducing optimism bias related to perceived crash risk. Additionally, further research is required to determine whether findings that insight based manipulations can reduce some types of driving-related optimism bias can be generalised from learner drivers to the wider community of novice drivers. Furthermore, research is required to determine whether other types of difficult driving-related tasks, particularly briefer lower-cost forms, such as hazard perception tasks, are effective in reducing optimism bias in the same way as a practical driving task (Gregersen, 1996). Further research is also required to determine the sustained or delayed effectiveness of these interventions in reducing optimism. While other studies have followed up their interventions in the short term (e.g., Falk & Montgomery, 2009; McKenna & Myers, 1997), there is a lack of research examining sustained effectiveness and delayed effects of such interventions on reducing driving-related optimism bias. Potential delayed effects are especially important because previous research suggests road-based training may contribute to increasing optimism bias and risky attitudes to driving, through over-confidence in one's skills (Gregersen, 1996). Hence, interventions that appear immediately effective may not be effective over time, and may even contribute to more detrimental attitudes to risky behaviour and more optimism bias in the long term. Finally, it is also important to establish whether interventions designed to modify optimism bias have any effect on other driving-related attitudes, as attitudes may influence driving behaviour.

1.2. THE CURRENT PROJECT

This research aimed to provide further support for the use of insight and accountability interventions as practical strategies to reduce optimism bias. Participants exposed to insight and accountability interventions were compared to a control group. Participants in the insight manipulation were required to complete a difficult hazard perception task (see Isler et al., 2009) before evaluating their driving skills, safety and accident risk relative to the average young driver and answering questions assessing attitudes to various driving behaviours and situations. Participants in the accountability condition were required to complete the same questionnaire but after first receiving instructions that that they would be later assessed on their skills, caution and accident risk in a driving simulation task. Following the questionnaire, participants in the accountability condition were then required to complete the driving simulation to increase face validity of the manipulation, though unbeknown to the participants no formal evaluation occurred. Participants in the control group completed only the questionnaire.

The present study had four specific objectives:

1) To investigate whether novel computer-based accountability and insight interventions led to immediate reductions in driving-related optimism bias.

2) To investigate the immediate effect of insight and accountability interventions on driving-related attitudes.

3) To investigate whether any effects of accountability and insight interventions found immediately were sustained after three months and whether any new effects emerged.

4) To investigate whether any effects of accountability and insight interventions on driving-related attitudes found at Time 1 were sustained after three months and whether any new effects emerged over time.

The Time 1 testing session addressed objectives 1 and 2, while the Time 2 testing session addressed objectives 3 and 4.

2. TIME 1

2.1. METHOD TIME 1

2.1.1. Participants

Participants were 243 young drivers aged 17 to 25 years who were recruited from the Queensland University of Technology's (QUT) first year psychology pool (n = 58, 24% of the sample), and from the university's email lists for students, staff and community members (classifieds list). One participant was excluded because they did not meet the age range criterion. Of the 242 remaining participants, 82 (33.9%) were male and 160 (66.1%) were female. Ages ranged between 17.33 and 25.67 years with a mean of 21.15 (SD = 2.31). The majority (85.1%) identified as Caucasian, 10.3% identified as Asian, 2.5% identified as "Other" and 0.8% identified as Aboriginal or Torres Strait Islander. The majority of the sample (49.6%) held an open, unrestricted driver's licence. Approximately 26% held a provisional two (P2) licence, 15.3% held a provisional one (P1) licence and 7.9% held a learner licence. One participant reported that they held an international licence. Four participants reported not holding an Australian driver's licence. Of those, 2 reported holding international licences that allowed them to drive on Australian roads and the other two participants, who reported being born overseas, reported having a class of Australian driver licences on a subsequent question.

Of the 242 valid participants at Time 1, 82 participants (74% female, 56% less than 3.67 years of driving experience) were randomly allocated to the control condition, 79 (62% female, 48% less experienced) to the insight condition and 81(61% female, 47% less experienced) to the accountability condition.

2.1.2. Measures

Questionnaire

A questionnaire was developed (see Appendix A for the relevant items) and administered to participants to assess demographic variables, including age, gender, ethnicity, driving experience, driving exposure and licence status. Questions were also included to establish participants' crash involvement and traffic fine history, self-rated driving skills (based on items from McKenna & Myers, 1997), safety (based on items used in Sibley & Harre, 2009), attitudes to road safety (see Ulleberg & Rundmo, 2002), perceived accident risk (see Gosselin et al., 2010) and hazard perception skills (created by the investigators). All optimism bias scales were altered to be measured on a seven-point scale (where 1= "much less" and 7 = "much more), for consistency among scales obtained from different previous studies. Scales measuring driving related attitudes used the same answer scale as Falk & Montgomery (2009), which was originally based on scales devised by Ulleberg and Rundmo (2002). Questionnaires administered to participants in the insight and accountability training groups also included questions about whether the participant had ever engaged in a similar task before, and the participants' pleasantness of their experience using the current study's computerised driving tasks. The questionnaire was initially piloted on a small group of university staff and students to ensure clarity of the items. The final questionnaire took a maximum of 20 minutes for participants to complete.

Demographics

Participants were asked to provide demographic details, including gender, age, birthplace and ethnicity. Additional information included driving experience, driving exposure and licence status. Questions were included to establish participants' crash involvement and traffic fine history.

Driver Skill

Participants were asked to provide a global estimate of their skill as a driver, compared to a typical young driver (see Horswill et al., 2004). Additionally, participants were required to rate their skill compared to a typical young driver on 17 specific skills (see McKenna & Myers, 1997). This additional measure of perceived skill was included on the basis of previous findings that general or ambiguous wording, such as that used in the global estimate question, can lead to an over-estimation of skill and inflated optimism bias (Sunderstrom, 2008).

Hazard Perception Skill

Participants were also required to complete six items assessing comparative estimates of their own hazard perception skills. Few studies have investigated how skilful drivers perceive themselves to be at detecting and responding to hazards. Horswill et al. (2004) addressed this issue by asking participants to rate their skills on various hazard perception skills compared to the average UK driver. However, some of these items may have assessed driver caution more so than hazard perception/identification skills (e.g., "maintaining appropriate distance from the

car in front", "maintaining appropriate speed for the conditions"). Thus, in the current study six new items were generated to specifically investigate optimism bias in relation to perceived hazard perception skills (see Appendix A, items 20 to 25).

Driver Caution

Participants were asked to provide a global estimate of their safety as a driver, compared to a typical young driver (see Horswill et al., 2004). Additionally, participants were required to answer eight questions, which together assessed comparative self-rated caution as a driver (Sibley & Harre, 2009).

Accident Risk

Participants were required to provide a global estimate of their accident risk. They were also asked questions about their accident risk in nine specific situations (see Gosselin, 2010). Gosselin (2010) found these nine questions to together provide a reliable measure of perceived accident risk (Cronbach's alpha = .92).

Driving-related Attitudes

To examine effects on related driving outcomes, participants' attitudes toward specific driving behaviours were measured using the same scales used by Falk and Montgomery (2009), which were originally devised by Ulleberg and Rundmo (2002). These attitude scales have been shown to have acceptable internal reliability (Attitudes to fun-riding $\alpha = 0.66$, Attitudes to speeding $\alpha = 0.81$, Attitudes to injury reflection $\alpha = 0.71$, Attitudes about concern for hurting others $\alpha = 0.70$). It should be noted, however, that a scale measuring attitudes to risk of accidents was excluded from their study, due to an unacceptable low level of reliability of 0.54.

Hazard Perception Task

The hazard perception test used in the current study was provided by Isler et al. (2009). Participants were seated in a room with minimal visual and audible distractions approximately 450mm from a computer screen (resolution 1280 x 1024 pixels) and provided with a computer mouse. The task included a series of 20 videos, in addition to four initial practice clips. The video clips were shown from the perspective of a driver, including views of the interior of a car, speedometer, rear view mirror and side mirrors. Each clip showed the car driving along different stretches of road, encountering various hazardous driving situations along the way. Each clip included between two and 14 hazards. Individual clips lasted between 30 seconds and two minutes and the total duration of all clips was approximately 20 minutes. Images of the hazard perception task can be found in Isler et al. (2009).

During all the clips, the participants' primary task was to identify immediate and potential hazards by clicking the left mouse button and verbally identifying the hazard. Participants were instructed to label immediate and potential hazards and describe the location (e.g., "person in front", "person on side"). Immediate hazards were defined as hazards that required the participant to take immediate evasive action (e.g., braking or swerving) to avoid a dangerous interaction with another road user. Potential hazards were defined as hazards that did not require immediate evasive action, but required attention because they could potentially develop into immediate hazards. When the participants clicked the mouse button, a high pitched beep sounded. Participants were instructed that they should verbally identify the hazard after they heard the beep. A digital audio recorder was used to record the participants' responses.

During the practice clip, the first four video clips and the last four video clips, participants were required to also complete a secondary task at the same time as identifying the hazards. In the secondary task, a stationary rectangle (103x80mm) was superimposed on the driving scenario screen. Within that rectangle, a 5mm moving dot (moving at 10mm/s) appeared. Participants were required to keep the moving dot within a square (30x30mm) by moving the square using the mouse. When the dot went out of the square, a low pitched 'beep' sounded and the border of the screen changed from black to purple for 500ms. The purpose of the central tracking task was to simulate other demands on attention that may be placed on the driver in a typical driving situation (e.g., steering). It was emphasised to participants that the most important task was to identify the hazards.

Driving Simulator

Participants were seated in a room with minimal auditory and visual distractions, in front of a desk-top driving simulator. The driving simulator consisted of a large projector screen (1.45m x 1.28m, 1400 x 1050 resolution), a steering wheel, automatic transmission pedals and speakers. The driving simulator required participants to steer and control the speed using the brake and accelerator pedals for approximately 10 minutes. The scenario included a multilane highway, shared by other vehicles ("Highway NG" scenario using the SCANer software, OKTAL, France). During the driving scenario, participants drove along a multi-lane highway with other vehicles sharing the road. While performance was not actually evaluated, the participants were led to believe that the driving simulator was a means of assessing their skill and safety as a driver.

2.1.3. Procedure

The questionnaire, desktop simulator and hazard perception task were piloted on Queensland University of Technology staff and post-graduate students prior to recruitment. For the main study, participants were randomly allocated to the insight manipulation (n = 79), the accountability manipulation (n = 81) or control condition (n = 82).

Control

In the control condition, participants were only required to complete a questionnaire asking them about their skills, safety and accident risk as a driver, as well as assessing attitudes to various driving behaviours and situations (see Measures).

Insight Manipulation

Participants in the insight manipulation were instructed that they would first have to complete a hazard perception test and then a questionnaire asking them about their skills, safety, accident risk and driving-related attitudes. The purpose of the hazard perception task was to provide participants with a difficult driving-related task to reflect on in order to provide insight into driving-related limitations and hence reduce driving-related optimism bias.

Accountability Manipulation

Participants in the accountability manipulation were instructed to complete a questionnaire about their skills, caution, accident risk and driving-related attitudes. Participants were told that

their driving would be subsequently assessed using a desktop driving simulator task, which they completed next. The purpose of the simulation was to add face validity to the intervention by making participants believe their skills, safety and accident risk were actually being assessed.

Compensation and Contact Details

Participants completed the experiment individually to reduce the effect of peer influence. At the end of Time 1, first-year psychology students were offered ½ hour worth of course credit for their introductory psychology courses. Participants who were not eligible to collect first year course credit were offered $20 as compensation for their time and effort. Participants were also requested to provide a name, email address and phone number for the research team to contact them to participate at Time 2.

2.2. RESULTS TIME 1

Key demographics of the sample are described to provide a snapshot of the young driver sample participating in this study. Next, the psychometric properties of the scales are presented, followed by the acute Time 1 analyses examining acute effectiveness of the interventions compared with a control group on measures of optimism bias and on driving-related attitudes. These analyses were conducted immediately following the Time 1 analyses to determine if there were any immediate effects of the intervention and are based on the full sample of 242 participants.

2.2.1. Demographics

Most participants (55.8%) reported that they drove their personal car as their primary mode of transport. Thirty percent relied on public transport as their primary mode of transport, 5.4% mainly used a private car as a passenger, 2.1% walked, 1.2% rode a motorcycle and 0.9% cycled as their primary mode of transport. Four percent reported using 2 or more modes of transport equally. Most (71.1%) of the sample owned a car.

The years of driving experience of the sample ranged from less than 1 year to 10 years, with a mean of 4.08 years (*SD* = 2.17). This variable was later split according to the median score of 3.76 years (which divides the sample into approximately 50% below and above this point) to create “less experienced” and “more experienced” groups as an additional variable included in the statistical analyses. “Less experienced” drivers were defined as drivers with more than 6 months, but less than 3.67 years of driving experience. “More experienced” drivers were defined as having between 3.67 and 10 years of driving experience (inclusive). Nine participants (3.7%) reported having ever lost their licence, 18.6% had received a traffic fine or loss of points in the past year and 2.9% reported that they had received a traffic fine or loss of points in the month prior to completing the survey.

Participants reported driving an average of 5.95 hours and 173.34 kilometres per week. The majority of participants (57.4%) reported driving mainly on suburban roads, 31.8% reported driving only on suburban roads, 9.1% reported that they drove on suburban and country roads equally and 4 participants (1.7%) drove only on country roads. Only 21% of the sample reported receiving formal driver training.

Fifteen percent of participants had been involved in a car crash as a driver in the 12 months prior to completing the survey. Of those who had been involved in an accident as the driver, only 1 (0.4% of the full sample) required hospitalization for themselves or for another

passenger in their car and in only one case (0.4% of the full sample) did someone outside of the car require hospitalisation as a result of the crash. In only 4.1% of the crashes did the car require towing as a result of the crash. Only 6.6% of participants had been involved in a car accident as a passenger in the year prior to completing the survey.

2.2.2. Scale reliability

Cronbach's alpha levels of more than 0.70 indicated acceptable scale reliability (Peterson, 1994) for all driving-related optimism bias scales. Three of the attitude scales however did not reach an acceptable level: Attitudes towards Fun-riding, Accident Risk, and Concern for Others (see Table 1). One item from each of the Fun-riding and Concern for Others Attitude scales were removed on the basis of poor item-scale correlations, resulting in acceptable Cronbach's alpha levels for the revised scales (.77 and .70 respectively). The internal reliability of the Accident Risk scale could not be improved by item deletion and was thus excluded from subsequent analyses.

Table 1
Cronbach's Alpha Values for Scales (revised scale properties indicated in parentheses)

Scale	α(revised scale)	Number of Items (revised scale)
Perceived Skills	.93	16
Perceived Hazard Perception Skill	.96	6
Perceived Caution	.91	8
Perceived Accident Risk	.92	9
Fun-riding Attitudes	.66 (.77)	3 (2)
Traffic Flow Attitudes	.86	9
Speeding Attitudes	.90	5
Injury Reflection Attitudes	.76	3
Risk of Accident Attitudes (Excluded)	.51	3
Concern for Others Attitudes	.68 (.70)	5 (4)

2.2.3. Time 1 acute effectiveness

A series of univariate and multivariate Analyses of Variances (ANOVAs and MANOVAs) were conducted on each set of optimism bias and attitudes measures as a function of level of driving experience (more than 6 months but less than 3.67 years vs. between 3.67 and 10 years driving experience), gender, and intervention group (insight vs. accountability vs. control). All relevant assumptions were met, with the exception of a few cases identified as multivariate outliers (assessed using Mahalanobis distance). These outliers were retained however, as the results of the analyses did not change with their removal. Multivariate and univariate results were assessed for significance using a criterion of $p < .05$. Significant univariate effects were examined further with multiple comparisons. To maximise the chance of detecting any significant effects, an alpha level of $p < .05$ was applied throughout, without adjustments for multiple comparisons. It is recognised that this may inflate the risk of type I error. Relevant Time 1 descriptive statistics for measures of optimism bias and driving-related attitudes can be found in Appendices B through G.

Optimism Bias for Perceived Driving Skills

ANOVAs were undertaken separately for the optimism bias global measure for general skill (questionnaire item 1) and for the specific measures for individual driving skills (mean scale score of items 4 - 19) and hazard perception skills (items 20-25). For all three ANOVAs, there were no significant main effects or interactions involving the intervention (see Tables 2 to 4).

While there were no significant interactions for the global measure of general skill, significant pairwise comparisons of involving general skill were examined for exploratory purposes only to identify any potential trends in the data and inform future research in this area. Despite higher order interactions being non significant, a trend-level interaction between gender, intervention and experience was evident, $F(2, 30) = 3.84$, $p = .02$, 95% .Of the female participants with less than 3.76 years driving experience, those exposed to either the insight intervention ($n = 25$, $M = 4.36$, $SD = 1.19$, $p = 0.01$, 95% CI [0.14, 1.20]) or accountability intervention ($n = 23$, $M = 4.44$, $SD = 1.31$, $p = 0.03$, 95% CI [0.05, 1.14]) rated their comparative perceived driving skill as significantly lower than those in the control condition ($n = 36$, $M = 5.03$, $SD = 0.97$). However, given the non-significant higher order interaction effect (see Table 2), this finding should be regarded as an acute trend only that requires further replication.

Table 2
Analysis of Variance for Comparative General Driving Skill Ratings, as a Function of Intervention, Gender and Experience

Source		*df*	*F*	η_p^2	*p*
Intervention (I)		2	1.19	0.01	0.31
Gender (G)		1	4.61	0.02	**0.03**
Experience (E)		1	9.42	0.04	**0.01**
I x G		2	0.67	0.01	0.51
I x E		2	0.75	0.00	0.47
G x E		1	0.13	0.00	0.72
I x G x E		2	1.08	0.01	0.34
I simple effect (Exploratory Trend)	Females with less than 3.67 years experience	2	3.84	0.02	**0.03**
Error		230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance ($p < 0.05$) are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Table 3
Analysis of Variance for Comparative Ratings of Skill at Specific Driving Tasks as a Function of Intervention, Gender and Experience

Source	*df*	*F*	η_p^2	*p*
Intervention (I)	2	0.65	0.01	0.52
Gender (G)	1	3.35	0.01	0.07
Experience (E)	**1**	**6.40**	**0.03**	**0.01**
I x G	2	0.90	0.01	0.41
I x E	2	1.42	0.01	0.24
G x E	1	0.21	0.01	0.65
I x G x E	2	0.27	0.00	0.77
Error	230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Table 4
Analysis of Variance for Comparative Ratings of Hazard Perception Skills as a Function of Intervention, Gender and Experience

Source		*df*	*F*	η_p^2	*p*
Intervention (I)		2	0.47	0.00	0.63
Gender (G)		**1**	**6.85**	**0.03**	**0.01**
Experience (E)		**1**	**7.19**	**0.03**	**0.01**
I x G		2	1.97	0.02	0.14
I x E		2	0.35	0.00	0.70
G x E		1	0.48	0.00	0.49
G simple effect (Exploratory Trend)	*More than 3.76 years experience*	*1*	*5.67*	*0.02*	*0.02*
I x G x E		2	1.80	.02	.17
Error		230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Optimism Bias for Perceived Safety as a Driver

ANOVAs were next undertaken separately for the two different measures of optimism bias for perceived safety as a driver: the global measure (Item 2) and the driver safety scale measure (mean scale score of items 26-33). ANOVAs revealed no significant main effects or interactions involving intervention for general safety or safety in specific situations (see Tables 5 and 6, respectively).

Table 5
Analysis of Variance for Perceived General Safety as a Function of Intervention, Gender and Experience

Source	*df*	*F*	η_p^2	*p*
Intervention (I)	2	1.26	0.01	0.29
Gender (G)	1	2.25	0.01	0.14
Experience (E)	1	3.59	0.02	0.06
I x G	2	1.31	0.01	0.27
I x E	2	2.45	0.02	0.09
G x E	1	1.08	0.01	0.30
I x G x E	2	0.11	0.00	0.90
Error	230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Table 6
Analysis of Variance for Perceived Safety in Specific Situations as a Function of Intervention Type, Gender and Experience

Source	*df*	*F*	η_p^2	*p*
Intervention (I)	2	1.11	0.01	0.33
Gender (G)	**1**	**7.33**	**0.03**	**0.01**
Experience (E)	1	3.31	0.01	0.07
I x G	2	0.76	0.01	0.47
I x E	2	2.77	0.02	0.07
G x E	1	2.44	0.01	0.12
I x G x E	2	0.04	0.00	0.96
Error	230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Optimism Bias for Perceived Accident Risk

ANOVAs were next conducted on the two measures of optimism bias for perceived accident risk: the global measure of overall comparative accident risk (Item 3) and the specific accident risk scale measure incorporating specific situations and road conditions (mean scale score of items 34-42) (see Tables 7 & 8). A significant interaction was found between intervention, gender and experience on overall comparative accident risk ratings, $F(2, 230) = 3.24$, $p = .04$ (see Table 7). Further comparisons of this interaction revealed an acute effect of the hazard perception intervention for young males with more than 3.76 years of driving experience. Of this subgroup, those exposed to the insight intervention ($n = 17$) rated their comparative accident risk as significantly lower ($M = 2.29$, $SD = 1.05$) than those in the control condition (n

= 11, *M* = 3.64, *SD* = 1.75), *F*(2, 230) = 3.55, *p* = .03, 95% CI [0.25, 2.43]. Thus, overall accident risk-related optimism bias was actually increased in the insight condition for young male drivers with between 3.67 and 10 years of driving experience.

Using scale scores comprised of participants' ratings of their accident risk in specific driving situations, an ANOVA revealed a significant interaction between intervention and experience, *F*(2, 230) = 4.74, *p* = .01, (see Table 8). Further comparisons of the interaction revealed an acute effect of the accountability intervention only for those young drivers with less than 3.76 years driving experience (see Table 7). Among these less experienced drivers (> 6 months, < 3.67 years of driving experience), those exposed to the accountability intervention (*n* = 38) rated their comparative accident risk in specific situations (compared to a typical young driver) significantly higher (*M* = 3.77, *SD* = .86) (thus showing reduced optimism bias) than did those who were exposed to the insight intervention, (*n* = 38, *M*= 3.39, *SD* = 1.08, *p* = .01, 95% CI [0.04, 0.87]) or to those in the control group (*n* = 46, *M* =3.23, *SE* = 0.77, *p* = .03, 95% CI [0.14, 1.00]).

Table 7
Analysis of Variance for General Perceived Accident Risk as a Function of Intervention, Gender and Experience

Source		*df*	*F*	η_p^2	*p*
Intervention (I)		2	0.34	0.00	0.71
Gender (G)		1	0.79	0.00	0.38
Experience (E)		1	2.59	0.01	0.11
I x G		2	0.62	0.01	0.54
I x E		2	2.30	0.02	0.10
G x E		1	0.14	0.00	0.71
I x G x E		**2**	**3.24**	**0.03**	**0.04**
I simple effect	**Males with more than 3.67 years experience**	**2**	**3.55**	**0.03**	**0.03**
Error		230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at *p* = .05. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at *p* = .05, but their higher order statistical tests were not significant at *p* = .05.

Table 8

Comparative Ratings of Accident Risk in Specific Situations as a function of Intervention Type, Gender and Experience

Source		*df*	*F*	η_p^2	*p*
Intervention (I)		2	0.48	0.00	0.62
Gender (G)		**1**	**6.99**	**0.03**	**0.01**
Experience (E)		**1**	**4.78**	**0.02**	**0.03**
I x G		2	0.92	0.01	0.40
I x E		**2**	**4.74**	**0.04**	**0.01**
I simple effect	**Less than 3.67 years driving experience**	**2**	**4.00**	**0.03**	**0.02**
G x E		1	0.90	0.00	0.34
I x G x E		2	0.07	0.00	0.94
Error		230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Driving-Related Attitudes

Finally, a MANOVA was undertaken on the five driving attitudes scales (attitudes towards fun-riding, obeying road rules, injury reflection, speeding, and concern towards hurting others), again as a function of intervention condition, driving experience and gender. However, Box's M Test of the assumption of equality of covariance matrices was breached, indicating the data was not suitable for MANOVA and separate ANOVAs were therefore conducted on each attitude scale separately (see Tables 9-13). Across these five ANOVAs, there was one marginally significant effect for intervention on attitudes related to concern for others, where those in the insight condition actually had less concern for others ($M = 4.15$, $SD = 0.71$) than their counterparts in the control condition ($M = 4.39$, $SD = 0.60$), $F(2, 230) = 2.97$, $p = 0.05$.

While not significant, several non-significant trends were evident that may inform future research are therefore reported here for that purpose only. The trend-level effects included a 3-way interaction between intervention, experience and gender on the fun-riding attitudes (see Table 9). Pairwise comparisons for this interaction suggest a trend for the accountability intervention to have had a negative effect on these attitudes for less experienced (> 6 months, < 3.67 years) females, with their scores significantly greater (reflecting more favourable attitudes toward fun-riding, $M = 1.98$, $SD = 1.15$) if they were exposed to the accountability intervention ($n = 23$) than if they were exposed to the insight intervention ($n = 25$, $M = 1.44$, $SD = .62$, $p = .01$) or were allocated to the control condition ($n = 26$, M=1.54, $SD = .79$, $p = .03$). A 2-way interaction between intervention and driving experience for the fun-riding scale was also identified as a trend (see Table 9), which reflects the largely female sample and trend just described for less experienced females.

Two trend-level ($p < .1$) 2-way interactions involving intervention and gender were identified for the speeding and concern for others attitudes scales (see Tables 12 & 13). Pairwise comparisons suggested both of these were due to differences between groups within the young male driver subgroup only (which was a smaller sample size and should therefore be

interpreted with caution). For attitudes towards speeding, male drivers in the insight intervention reported more positive attitudes towards speeding (M = 2.53, SD = 1.00) than those in the control group (M = 2.04, SD = .80), p =.03. For concern for hurting others, male drivers in the insight experience (n = 30) group scored lower (M = 3.80, SD = .79) than those in the accountability condition (n = 21, M = 4.09, SD = .41, p = .04), or control condition (n = 31, M = 4.22, SD = .52, p = .008). However, it must be noted that these are acute trends only, with the higher-order interaction in the ANOVA not found to be significant and small subgroup sizes for the males in the sample making their findings less robust.

When the analyses were repeated without learner drivers, one new effect on driving-related attitudes emerged. There was a significant 2-way interaction between intervention and experience, F(2, 196) = 3.01, p = 0.05. Among less experienced drivers (> 6 months, < 3.67 years of driving experience), those in the accountability condition (n = 38, M = 2.12, SD = 1.01) reported more favourable attitudes to fun-riding than participants in the control (n = 46, M = 1.61, SD = 0.78, p = 0.01) or insight (n = 38, M = 1.69, SD = 0.77, p = 0.03) conditions.

Table 9
Analysis of Variance for Attitudes to Fun-Riding as a Function of Intervention Type, Gender and Experience

Source		*df*	*F*	η_p^2	*p*
Intervention (I)		2	1.52	0.01	0.23
Gender (G)		**1**	**17.59**	**0.07**	**<0.01**
Experience (E)		1	2.36	0.01	0.13
I x G		2	0.15	0.00	0.86
I x E		2	2.62	0.02	0.08
I simple effect (Exploratory trend)	*Less than 3.67 years experience*	*2*	*3.90*	*0.03*	*0.02*
G x E		1	0.00	0.00	0.96
I x G x E		2	2.51	0.02	0.08
I simple effect (Exploratory trend)	*Females with less than 3.67 years experience*	*2*	*3.72*	*0.03*	*0.03*
Error		230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at p = .05. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at p = .05, but their higher order statistical tests were not significant at p = .05.

Table 10.
Analysis of Variance for Attitudes to Obeying Traffic Rules vs. Keeping Up with the Traffic Flow as a Function of Intervention, Gender and Experience.

Source		*df*	*F*	η_p^2	*p*
Intervention (I)		2	1.26	0.01	0.29
Gender (G)		1	2.25	0.01	0.14
Experience (E)		1	3.59	0.02	0.06
I x G		2	0.81	0.01	0.45
I x E		2	1.97	0.02	0.14
I simple effect (Exploratory Trend)	*Less than 3.67 years of driving experience*	*2*	*3.57*	*0.03*	*0.03*
G x E		1	0.24	0.00	0.62
I x G x E		2	1.84	0.02	0.16
Error		230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Table 11.
Analysis of Variance for Injury Reflection as a Function of Intervention, Gender and Experience.

Source	*df*	*F*	η_p^2	*p*
Intervention (I)	2	1.50	0.01	0.23
Gender (G)	**1**	**39.67**	**0.15**	**<0.01**
Experience (E)	1	0.58	0.00	0.45
I x G	2	0.74	0.01	0.48
I x E	2	1.20	0.01	0.30
G x E	1	2.26	0.01	0.13
I x G x E	2	0.53	0.01	0.59
Error	230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Table 12.

Analysis of Variance for Attitudes to Speeding as a Function of Intervention, Gender and Experience.

Source		*df*	*F*	η_p^2	*p*
Intervention (I)		2	1.40	0.01	0.25
Gender (G)		**1**	**10.61**	**0.04**	**<0.01**
Experience (E)		1	0.48	0.00	0.49
I x G		2	2.70	0.02	0.07
I simple effect (Exploratory trend)	*Male*	*2*	*2.51*	*0.02*	*0.08*
I x E		2	1.20	0.01	0.30
G x E		1	2.26	0.01	0.13
G simple effect (Exploratory trend)	*More than 3.67 years of driving experience*	*1*	*9.1*	*0.04*	*<0.01*
I x G x E		2	1.12	0.01	0.33
I simple effect (Exploratory trend)	*Male with less than 3.67 years*	*2*	*3.46*	*0.03*	*0.03*
Error		230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Table 13.

Analysis of Variance for Concern for Hurting Others as a Function of Intervention, Gender and Experience.

Source		*df*	*F*	η_p^2	*p*
Intervention (I)		**2**	**2.97**	**0.03**	**0.05**
Gender (G)		**1**	**39.67**	**0.15**	**<0.01**
Experience (E)		1	0.53	0.00	0.47
I x G		2	2.47	0.02	0.09
I simple effect (Exploratory Trend)	*Male*	*2*	*4.07*	*0.03*	*0.02*
I x E		2	0.62	0.01	0.54
G x E		**1**	**5.45**	**0.02**	**0.02**
E simple effect	**Females**	**1**	**6.99**	**0.03**	**0.01**
I x G x E		2	0.24	0.00	0.79
I simple effect (Exploratory trend)	*Males with less than 3.67 years experience*	*2*	*3.50*	*0.03*	*0.03*
Error		230			

Note. All ANOVA effects are presented and any multiple comparison effects reaching significance are presented, even where the ANOVA effect was not significant (for exploratory trend purposes only). I = intervention condition (insight, accountability and control). Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where follow-up tests or pairwise comparisons were significant at $p = .05$, but their higher order statistical tests were not significant at $p = .05$.

Effects of Gender and Experience

There were several main effects and interaction effects involving gender and experience, independent of intervention group. Relevant statistical test data for these effects are provided in Tables 3 through 9, and descriptive statistics are provided in Appendices B through G. Given that the main objective of the current research was to determine the effectiveness of accountability and insight interventions, no results independent of intervention group are discussed at length in the results or discussion.

It is acknowledged that learner drivers in Queensland (who are required to be accompanied at all times by a driver who had held an open driver licence for at least one year) may differ from unsupervised drivers in their levels of risk perceptions and optimism bias. As such, analyses were run with and without learner drivers included. Minimal differences in results were found. Notably, the tendency for less experienced drivers (> 6 months, < 3. 67 years) in the accountability condition to give higher estimates of accident risk in specific situations than the insight group or the control group was significant when all drivers were included, but further comparisons were non-significant when learners were excluded. This finding may be due to the reduced sample size of inexperienced drivers and hence reduced power that results from excluding learner drivers from the analyses. Also, when learners were excluded, there was a significant interaction between intervention and experience for fun-riding emerged where less experienced drivers in the accountability condition reported more positive attitudes to fun-riding than less experienced drivers in the control or insight conditions. This effect was not evident when learners were included.

2.3. DISCUSSION OF TIME 1 RESULTS

The purpose of Time 1 was to address the first two objectives. The first objective of the current study was to determine whether accountability and insight interventions would be effective at immediately reducing driving-related optimism bias, related to perceived driving skill, safety and accident risk. The second objective of the current study was to determine whether accountability and insight-based interventions would have an immediate significant effect on driving related attitudes. Generally, it was found that neither accountability nor insight-based manipulations were effective immediately at Time 1 (acute effect) at reducing optimism bias related to perceived skill, safety or accident risk for all young drivers studied. Only one significant reduction in optimism bias was found. Less experienced young drivers in the accountability condition gave higher estimates of accident risk in specific situations than their counterparts in the control and insight groups. Furthermore, there was a significant increase in general accident risk perceptions among males with more than 3.67 years driving experience in the insight condition compared to the control participants. The second objective of the study was to determine whether accountability and insight interventions would have any immediate effect on driving-related attitudes. There was a marginally significant effect of the insight intervention on attitudes related to concern for others where those in the insight condition actually had less concern for others than control participants.

Accountability and insight manipulations were generally not effective in reducing optimism bias in terms of perceived skill safety and accident risk, with one exception. For less experienced (< 3.67 years driving experience) young drivers, the accountability intervention showed acute effectiveness in terms of reducing ratings of their comparative accident risk in specific driving situations, compared to less experienced drivers in the insight intervention or control conditions. There were no significant effects of the interventions on perceived general driving skill. However there was a non-significant trend for less experienced females in the

accountability and insight conditions to have less perceived comparative overall driving skill (less optimism bias) than less experienced females in the control group. Importantly, this trend showed no difference between the two intervention groups. Together, these results are promising in suggesting the potential of the two interventions to reduce driving skill-related and accident risk-related optimism bias in less experienced young drivers, thereby potentially facilitating safer driving behaviours.

The finding that the interventions did not significantly reduce perceived driving skill or safety is inconsistent with previous findings that accountability (McKenna & Myers, 1997) and insight-based manipulations (Gregersen, 1996) can effectively reduce such optimism bias. There may be a number of reasons why the current results are not generally consistent with previous findings. Firstly, in previous studies that have used accountability interventions, the evaluator was someone perceived as relevant to the task. For example, Sedikides et al. (2002) used a 5th year PhD student to evaluate participants' essay writing skills. Similarly, McKenna and Myers (1997) found that audience status was a significant predictor of optimism bias. When participants believed they were going to be assessed by a specialized driving instructor, they showed less optimistic estimates of their driving skill and safety (McKenna & Myers, 1997). In the current study, the assessor's status was not revealed. Hence, the participants, particularly older more experienced young drivers, may not have judged that the experimenter was appropriately qualified to assess their driving skills, limiting the effectiveness of the accountability manipulation, particularly among more experienced drivers.

Previous studies that have used accountability manipulations have also found that the more identifiable the participant is, the less optimism bias they show. Sedikides (2002) found that participants who were held accountable but were non-identifiable showed similar amounts of optimism bias to those who were not held accountable at all. In the present study, participants were relatively non-identifiable. Participants may have shown less optimism bias if they believed the experimenter was going to evaluate provide feedback regarding their performance while they were still present. Also, Sedikides (2002) found that levels of optimism bias were influenced by participant's perceptions of how rigorously they were going to be assessed. When participants were led to believe that the assessor would be particularly critical, lower estimates of skill resulted (Sedikides, 2002). In the current study, insufficient emphasis may have been placed on the assessment. Future research is required to further establish the role of anonymity and audience status in accountability manipulations that aim to reduce driving-related optimism bias.

In terms of the insight-based manipulation, previous studies have used practical skidpan training (e.g., Gregersen, 1996), rather than computer-based tests. It is possible a computer based test does not allow sufficient insight into the degree of difficulty involved for a variety of driving situations. Furthermore, it is possible that the insight intervention used in the current study was too brief, as previous research (e.g., Perrisol et al., 2011) has found reduction in driving-related optimism bias associated with a lengthy two-day theory-based insight training program. Additionally, both Gregersen (1996) and Perrisol et al. (2011), who have found promising results supporting the use of insight manipulations, have used restricted samples (very inexperienced drivers and driving offenders respectively). Hence, it is possible that their support for insight-based manipulations do not generalise to the wider population of young drivers. Another potential reason for the lack of significant findings related to the insight intervention might be that the hazard perception task acted as a skill-based training session. Skill based training programs have been shown to increase driving-related optimism bias in some circumstances (Gregersen, 1996) and hazard perception tasks in particular have been associated with an improvement in hazard perception skills (Isler et al., 2009). Future research

is required to investigate the effectiveness of insight-based interventions at reducing perceived skill and safety in a broader subsample of the community. Further, it may be valuable to establish whether insight and accountability interventions are effective in other subsets of the community before dismissing them as ineffective. Finally, future research should investigate whether the skill gains associated with the insight manipulation using this type of hazard perception task outweigh the potential increase in optimism bias.

Consistent with previous research (e.g. McKenna & Myers, 1997; Gregersen, 1996), there was no main effect of accountability interventions on optimism bias related to perceived accident risk. However, the accountability intervention was associated with reductions in accident-risk related optimism bias in a subsample of less experienced young drivers (<3.67 years of driving experience). For less experienced drivers, those in the accountability condition rated their accident risk for specific situations as significantly higher than control participants. Hence for less experienced drivers, the accountability manipulation was associated with a decrease in optimism bias in relation to perceived accident risk. One explanation for why this has not previously been found is that earlier studies (i.e. McKenna & Myers, 1997) have only considered their larger sample, without considering the moderating influence of driving experience within the sample. Interestingly, the insight intervention was associated with an increase in accident risk related optimism bias in more experienced male drivers. Male drivers with more than 3.76 years driving experience in the insight intervention actually showed more optimism bias (lower perceived overall accident risk) than the more experienced males in the control group. The insight condition may have increased optimism bias among more experienced males because it lead them to believe that their ability to avoid potential accidents was improved. It is not surprising that the intervention resulted in increased accident risk related optimism bias in males but not females, given that males have previously been found to have higher levels of optimism bias (Dejoy, 1992). Similarly, it is not surprising that the effect was only among more experienced male drivers, given that inexperienced drivers may feel less confident in their driving abilities and abilities to avoid accidents. These results should be interpreted with caution, however, because this group of males with more than 3.67 years of driving experience constituted a relatively small number of the total sample (n = 44, 18%).

To the research team's knowledge, this study is one of the first to investigate the effect of accountability and insight interventions on driving-related attitudes. Generally it was found that there was only one significant effect of intervention group on driving related attitudes. Those who underwent the insight manipulation actually had less concern for other drivers than less experienced drivers in the control condition. This may be because the hazard perception task used as a means of insight in the insight intervention depicted to participants that other drivers were often at fault, hence leaving participants feeling less responsible for potential accidents and reducing participants' concern for other drivers. These findings suggest that the insight manipulation may have a detrimental effect on some types of driving-related attitudes among young drivers. Future research is required to understand the mechanisms underlying this detrimental effect of the insight intervention on driving-related attitudes and to understand whether these changes in attitudes have any subsequent impact on actual driving behaviour.

It was recognized that learner drivers may not be representative of young drivers in general, given that they are required to be supervised by an experienced driver at all times. As such, further analyses were undertaken, excluding learner drivers. There were minimal differences in results when learner drivers (n = 20) were included and excluded. Notably, when learners were excluded, there was still a significant interaction between intervention and experience for specific accident risk. However, lower order comparisons became non-significant when learners were excluded. This is likely because of the lack of power resulting from the smaller

sample size. Furthermore, given that there was an effect among less experienced drivers, and excluding learners removed the most inexperienced drivers, this finding is not surprising. There was only one new effect when learners were excluded. There was a significant intervention by experience interaction where by less experienced drivers in the accountability condition reported more positive attitudes to fun-riding than less experienced drivers in the control or insight conditions. This finding may reflect that learner drivers would likely not have positive attitudes to fun-riding behaviours (given that they are always under supervision). The additionally finding that excluding learners from the analysis revealed a new effect involving the accountability on attitudes to fun –riding suggests that excluding learner drivers may not be representative of young drivers in general and excluding them from analyses may provide a clearer picture of the attitudes of unsupervised young drivers.

There are several limitations that must be considered when interpreting the results of the current study. First, from the title of the study ("Reducing Optimism Bias in Young Novice Drivers"), it is possible that participants entered the experiment with preconceived ideas of the study and the expectations of the researchers, hence inducing response bias. Additionally, there was no confirmation that the driver's estimates of their skills, safety and accident risk was unrealistic compared to their actual skills, as this was beyond the scope of the current research. Finally, the sample was restricted to university staff students and affiliates, and thus potentially may not be representative of the general community. Despite these few limitations, the current results are of value because they provide an evaluation of brief and cost effective intervention as opposed to expensive, labour and time intensive interventions such as in-car, on-road training.

The current findings provide information about the effectiveness of two brief, cost effective interventions aimed at reducing perceived driving skill, caution and accident risk. Overall the interventions employed had a minimal effect on driving-related optimism bias. Findings that interventions were more effective in some subgroups than others, suggests that the interventions may be more effective if targeted at specific groups, particularly at less experienced young drivers. Future research should further investigate the potential effectiveness of accountability and insight interventions in subgroups of young drivers. Furthermore, detrimental effects of the intervention (i.e., increases in optimism bias in more experienced males who undertook the hazard insight condition) should be further investigated. It may also be valuable to investigate whether other individual factors, such as personality influence the effectiveness of interventions aimed at reducing optimism bias. Finally, an examination of the Time 2 follow-up ratings of these participants is needed, 3 months from their exposure to the interventions, to determine if any other effects emerge over time, that were not yet evident at the time of the interventions being introduced. Similarly, the subgroup effects that were found need to be examined at 3-month follow-up to determine if such effects are sustained over the medium term (see Time 2).

The immediate effects of the interventions found in the current study do not support the inclusion of insight or accountability interventions into licensing procedures for young drivers as a whole. However, if further research confirms that accountability interventions are effective among inexperienced drivers, targeting the accountability intervention at this subgroup of young drivers may be warranted. Similarly, given the negative effects of the insight intervention on more experienced male drivers, caution should be exercised when exposing more experienced male young drivers to similar tasks that may serve to increase their driving-related optimism bias. Furthermore, insight-based tasks should be used with caution among young drivers in general, given that undergoing the insight task reduced driver's concern for others among the entire sample of young drivers.

3. TIME 2

This phase of the study examined the sustained and delayed effects of the accountability and insight interventions on driving-related optimism bias at three-months post-intervention.

3.1. METHOD TIME 2

3.1.1 Participants

Participants were approximately 94% (227, comprising 74 controls, 76 insight and 77 accountability) of the initial sample of 242 people who completed valid questionnaires at Time 1. Thirty-three per cent of the remaining 227 participants were male and 67% were female. Participants at Time 2 had a mean age of 21.19. The majority (85%) were Caucasian, 11% were Asian, 2.7% identified as "Other" and two participants identified as indigenous Australians. Of the 227 valid participants who completed both Time 1 and Time 2 testing, the average number of years of experience reported at Time 1 testing was 4.17 years (SD = 2.20). Twelve participants (5.3%) had received a fine in the month prior to Time 2 testing. Four per cent (9 participants) had received a fine in the three months prior to Time 2 testing. Four participants (1.8%) had been in an accident as a passenger and seven (3.7%) had been in an accident as the driver in the three months prior to Time 2 testing. Of the remaining 227 valid participants at Time 2, 74 (76% female, 56% less experienced) were allocated to the control group, 76 (62% female, 49% less experienced) to the hazard perception group and 77 (63% female, 46% less experienced) to the accountability group.

3.1.2. Measures

Participants completed a questionnaire with scales relevant to driving-related perceived skills, caution, accident risk and attitudes (see Appendix A).

3.1.3. Procedure

Participants were contacted by email or phone approximately three months after their initial testing session and informed that it was time to participate in a follow up survey. Participants were provided with a link to the survey and a unique code to enter on the website before commencing the questionnaire so that their Time 2 data could be matched with their Time 1 data. The final page of the questionnaire directed participants to contact the research team, including details of their unique code, to arrange a time for them to collect their compensation, which was either $20 or ½ hour worth of course credit (for first-year psychology students only).The research team stopped contacting participants to participate in the follow-up questionnaire if they did not respond within four weeks of their expected completion date.

3.2. RESULTS TIME 2

3.2.1. Scale Reliability

All scales displayed adequate reliabilities above .70 (Field, 2009). While no scales required items to be removed, one item was removed from the 'Attitudes to Fun-riding' scale, and another was removed from the 'Attitudes to Concern' scale to maintain consistency with Time 1 analyses. Table 14 shows the alpha value and number of items in each scale.

Table 14
Cronbach's Alpha Values for Scales used at Time 2 (revised scale properties indicated in parantheses)

Scale	α(revised scale)	Number of Items (revised scale)
Perceived Skills	0.95	16
Perceived Hazard Perception Skill	0.97	6
Perceived Caution	0.92	8
Perceived Accident Risk	0.93	9
Fun-riding Attitudes	0.71(0.84)	3(2)
Traffic Flow Attitudes	0.89	7
Speeding Attitudes	0.92	5
Injury Reflection Attitudes	0.83	3
Risk of Accident Attitudes (Excluded)	0.52	3
Concern for Others Attitudes	0.76 (0.74)	5(4)

3.2.2. Analyses

A series of Mixed Design ANOVAs were conducted on each set of optimism bias and driving-related attitude measures to determine whether there was any effect of intervention group, gender and experience both at Time 1 and Time 2 (approximately 3 months later) on driving-related optimism bias or attitudes. It should be noted that, although the median split of the experience variable was altered slightly with the decreased sample size, 3.67 years of driving experience was retained as the median to maintain consistency with Time 1 analyses. The driving experience variable was based on experience at Time 1, and was not adjusted to reflect the experience participants would have gained between testing sessions. Although Time 1 data is included in these analyses, we focus our comments only on any effects specific to Time 2. While there were some statistical breaches of normality, it was decided that normality assumptions were met, given adequate graphical normality and also given that large sample sizes (> 200) can lead to inflated breaches of normality (Tabachnick and Fidell, 2001). The homogeneity of variance assumption was breached for subscales measuring attitudes to fun-riding and attitudes to concern for hurting others. This breach was accepted when interpreting the analyses, due to similar sample sizes between intervention groups (Stevens, 1996). Similarly, homogeneity of variance covariance matrices were breached for three of the attitude scales. However this was disregarded as group sample sizes were similar (Tabachnick & Fidell, 2001). Some multivariate and univariate outliers were identified. However, these were retained as their removal did not impact the results of the analyses and there was not sufficient cause to believe that they were true outliers. To maximise the chance of detecting any genuine significant effects, an alpha level of $p < 0.05$ was applied throughout. To account for the possibility that learner drivers may not be representative of the general young driver population, analyses were run with and without the inclusion of learner drivers ($n = 20$). All tables and statistics in the results section refer to analyses with learners included unless otherwise stated. Differences in results including learners are noted in any relevant sections of the text.

3.2.3. Time 2 sustained effectiveness

<u>Effects of Interventions on Optimism Bias for Perceived Driving Skills</u>

Mixed design ANOVAs were undertaken separately for the global estimates of skill, estimates of skill in specific situations and perceived hazard perception skill across Time 1 and Time 2.

There were no significant effects involving the intervention for general skill estimates, specific skill estimates or hazard perception skill estimates (see Tables 15, 16 & 17, respectively). The between groups factors were intervention, gender and experience, the within groups variable was Time (Time 1 & Time 2) and the dependent variables were general skill estimates, specific skill estimates and hazard perception skill estimates, with one ANOVA being run for each dependent variable.

Table 15

Main and Interaction Effects of Group, Time, Gender and Experience as a Function of Perceived General Skill

	Source	*df*	F	Sig.	η_p^2
Gen Skill	Group	2	1.19	0.31	.011
	Group x Gender	2	1.03	0.36	.010
	Group x Experience	2	0.40	0.67	.004
	Group x Time	2	1.14	0.32	.011
	Group x Gen x Exp	2	1.08	0.60	.001
	Group x Gen x Time	2	1.30	0.28	.012
	Group x Exp x Time	2	0.14	0.87	.001
	Group x Gen x Exp x Time	2	0.89	0.41	.008
	Time	1	0.40	0.53	.002
	Gender	**1**	**7.98**	**0.01**	**.036**
	Experience	**1**	**13.93**	**0.00**	**.062**
	Gender x Experience	1	0.27	0.60	.001
	Time x Gender	1	0.90	0.35	.004
	Time x Experience	1	0.20	0.66	.001
	Time x Gender x Experience	1	0.11	0.74	.001
	Error	212			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Table 16

Main and Interaction Effects of Group, Time, Gender and Experience as a Function of Perceived Skill in Specific Situations

	Source		*df*	F	Sig.	η_p^2
Mean Skill	Group		2	0.37	0.70	.003
	Group x Gender		2	0.68	0.51	.006
	Group x Experience		2	0.46	0.63	.004
	Group x Time		2	0.28	0.75	.003
	Group x Gen x Exp		2	0.27	0.76	.003
	Group x Gen x Time		2	0.14	0.87	.001
	Group x Exp x Time		2	0.90	0.41	.008
	Group x Gen x Exp x Time		2	2.30	0.10	.021
	Time		1	3.19	0.08	.015
	Gender		1	1.49	0.22	.007
	Experience		**1**	**11.00**	**<0.01**	**.049**
	Gender x Experience		1	<0.01	0.96	<.001
	Time x Gender		1	0.08	0.38	.004
	Time x Experience		**1**	**10.26**	**.002**	**.046**
		Simple effect of Experience at Time 1	**1**	**4.97**	**0.03**	**.023**
		Simple Effect of experience at Time 2	**1**	**15.94**	**<0.01**	**.070**
		Simple effect of Time among less experienced	**1**	**12.06**	**<0.01**	**.051**
	Time x Gender x Experience		1	3.81	.052	.018
	Error		213			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Table 17
Main and Interaction Effects of Group, Time, Gender and Experience as a Function of Perceived Hazard Perception Skills

	Source	*df*	F	Sig.	η_p^2
Mean HP	Group	2	0.50	0.61	.005
	Group x Gender	2	0.85	0.43	.008
	Group x Experience	2	0.28	0.76	.003
	Group x Time	2	1.97	0.14	.018
	Group x Gen x Exp	2	1.19	0.31	.011
	Group x Gen x Time	2	0.89	0.41	.008
	Group x Exp x Time	2	0.36	0.70	.003
	Group x Gen x Exp x Time	2	0.35	0.71	.003
	Time	1	3.45	0.07	.016
	Gender	**1**	**5.69**	**0.02**	**.026**
	Experience	**1**	**8.91**	**0.00**	**.040**
	Gender x Experience	1	0.21	0.65	.001
	Time x Gender	1	0.13	0.72	.001
	Time x Experience	1	2.41	0.12	.011
	Time x Gender x Experience	1	0.07	0.79	<.001
	Error	213			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Effects of Interventions on Optimism Bias for Perceived Driving Safety

Mixed design ANOVAs were undertaken separately for general safety estimates and specific safety estimates across Time 1 and Time 2. The between groups factors were intervention, gender and experience, the within groups factor was Time (Time 1 and Time 2) and the dependent variables were general and specific safety estimates (with one ANOVA for each type of safety estimate). There were no significant effects involving the intervention for general safety estimates (see Table 18). However, there was a significant four-way interaction between intervention, gender, experience and time for specific safety estimates, $F(2, 212) = 3.61$, $p = .03$ (see Table 19). While further comparisons revealed that the simple effect of intervention was non-significant $F(2, 212) = 2.14$, $p = 0.12$, significant pairwise comparisons revealed that there was a trend whereby less experienced (>6 months, < 3.67 years of driving experience) males in the insight condition gave lower estimates of their driving safety ($n = 12$, $M = 4.53$, $SD = 1.07$) than their counterparts in the control condition ($n = 9$, $M = 5.35$, $SD = 0.85$, $p = 0.04$) at Time 2 only.

Table 18

Main, Interaction, and Simple Effects (Where Relevant) of Group, Time, Gender and Experience on Perceived General Safety

	Source	*df*	F	Sig.	η_p^2
Gen Safety	Group	2	0.21	0.51	.002
	Group x Gender	2	0.97	0.38	.009
	Group x Experience	2	1.03	0.36	.010
	Group x Time	2	1.92	0.15	.018
	Group x Gen x Exp	2	0.38	0.68	.004
	Group x Gen x Time	2	0.01	0.99	.001
	Group x Exp x Time	2	0.71	0.50	.007
	Group x Gen x Exp x Time	2	0.33	0.72	.003
	Time	1	1.74	0.19	.008
	Gender	1	1.82	0.18	.009
	Experience	**1**	**3.17**	**0.08**	**.015**
	Gender x Experience	1	0.96	0.33	.005
	Time x Gender	1	0.15	0.70	.001
	Time x Experience	1	0.25	0.62	.001
	Time x Gender x Experience	1	<0.01	0.99	<.001
	Error	212			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Table 19

Main, Interaction, and Simple Effects (Where Relevant) of Group, Time, Gender and Experience on Perceived Safety in Specific Situations

	Source		*df*	F	Sig.	η_p^2
Mean Safe	Group		2	1.00	0.37	.009
	Group x Gender		2	0.83	0.44	.008
	Group x Experience		2	1.87	0.16	.017
	Group x Time		2	2.43	0.09	.022
	Group x Gen x Exp		2	0.76	0.47	.007
	Group x Gen x Time		2	0.74	0.48	.007
	Group x Exp x Time		2	1.61	0.20	.015
	Group x Gen x Exp x Time		**2**	**3.61**	**0.029**	**.033**
		Simple effect of time among more experienced females in the insight group	**1**	**5.09**	**0.03**	**.023**
		Simple effect of gender among less experienced drivers in the insight group at Time 2	**1**	**6.73**	**0.01**	**.029**
		Simple effect of gender among more experienced females in the accountability group at Time 2	**1**	**5.45**	**.021**	**.025**
		Simple effect of group among less experienced males at Time 2 (Exploratory Trend)	*2*	*2.14*	*0.12*	*.020*
		Simple effect of experience among males in the insight group at Time 2	**1**	**8.51**	**<0.01**	**.039**
	Time		1	0.08	0.77	<.001
	Gender		**1**	**7.15**	**0.01**	**.033**
	Experience		1	2.70	0.10	.013
	Gender x Experience		1	2.04	0.16	.010
	Time x Gender		1	0.02	0.88	<.001
	Time x Experience		1	0.36	0.55	.002
	Time x Gender x Experience		1	0.08	0.78	<.001
	Error		212			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Effects of Interventions on Optimism Bias for Perceived Accident Risk

Mixed design ANOVAs were undertaken separately for general accident risk estimates and specific accident risk estimates across Time 1 and Time 2 (See Tables 20 & 21, respectively). The within-groups variable was Time (Time 1 and Time 2), the between groups variables were intervention, gender and experience and the dependent variables were general and specific accident risk estimate (with one ANOVA for each type of accident risk estimates). There was a significant 3-way interaction between intervention, gender and experience for estimates of general accident risk, F (2, 215) = 3.50, p = 0.03. While further comparisons revealed that there were no significant simple effects of group, significant pairwise comparisons revealed that there was a trend among males with less experience, whereby those in the insight condition (n = 12) gave significantly higher ratings of their general accident risk (M = 3.58, SD = 5.25) than those in the control group (n = 9, M = 2.61, SD =5.17, p = 0.04). Additionally, significant pairwise comparisons revealed a trend whereby more experienced (3.67 – 10 years of driving experience) males in the insight condition (n = 16) gave lower estimates of their general accident risk (M = 2.59, SD = 1.41), than more experienced males in the control condition (n = 9, M = 3.50, SD = 1.62, p = 0.04). There were no significant effects involving group for accident risk estimates in specific situations (See Table 21).

Interestingly, when the analyses were run excluding learner drivers, there was a significant three-way interaction between intervention group, gender and experience on general accident risk, F(2, 196) = 7.05, p <.001. Further comparisons revealed that among males with more experience, those in the insight (n = 16, M = 2.47, SD = 1.36) and accountability (n = 14, M = 2.97, SD = 1.41) groups reported more optimism bias related to general accident risk (lower estimates of general accident risk) than those in the control condition (n = 9, M = 4.01, SD = 1.46, p = 0.02 and 0.04 respectively).

Table 20

Main, Interaction and Simple Effects (Where Relevant) of Group, Gender, Time and Experience on Perceived General Accident Risk

	Source		*df*	F	Sig.	η_p^2
Gen Acc	Group		2	0.11	0.90	.001
	Group x Gender		2	0.90	0.41	.010
	Group x Experience		2	2.76	0.07	.030
	Group x Time		1	1.77	0.17	.020
	Group x Gen x Exp		**2**	**3.50**	**0.03**	**.031**
		Simple effect of group among less experienced males (Exploratory Trend)	*2*	*2.38*	*0.10*	*.022*
		Simple effect of group among more experienced males (Exploratory Trend)	*2*	*2.09*	*0.13*	*.019*
		Simple effect of experience among males in the insight group	**1**	**5.93**	**0.02**	**.027**
	Group x Gen x Time		2	0.68	0.51	.010
	Group x Exp x Time		2	1.57	0.21	.010
	Group x Gen x Exp x Time		2	1.95	0.15	.020
	Time		**1**	**7.65**	**0.01**	**.034**
	Gender		1	0.09	0.77	<.001
	Experience		1	2.06	0.15	.010
	Gender x Experience		1	0.02	0.88	<.001
	Time x Gender		**1**	**5.09**	**0.03**	**.023**
		Simple effect of time among males	**1**	**9.30**	**<0.01**	**.041**
	Time x Experience		1	0.15	0.70	.001
	Time x Gender x Exp		1	0.55	0.46	.003
	Error		215			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Table 21
Main, Interaction and Simple Effects (Where Relevant) of Group, Gender, Time and Experience on Perceived Accident Risk in Specific Situations

	Source	*df*	F	Sig.	η_p^2
Mean Acc	Group	2	0.11	0.90	.001
	Group x Gender	2	1.16	0.32	.011
	Group x Experience	2	1.88	0.16	.017
	Group x Time	2	1.87	0.16	.017
	Group x Gen x Exp	2	0.01	0.99	<.001
	Group x Gen x Time	2	0.17	0.84	.002
	Group x Exp x Time	2	2.08	0.13	.019
	Group x Gen x Exp x Time	2	0.11	0.90	.001
	Time	1	0.03	0.86	<.001
	Gender	**1**	**5.70**	**0.02**	**.026**
	Experience	**1**	**5.87**	**0.02**	**.027**
	Gender x Experience	1	0.62	0.43	.003
	Time x Gender	1	3.28	0.72	.015
	Time x Experience	1	2.22	0.14	.010
	Time x Gender x Experience	1	<0.01	0.95	<.001
	Error	212			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Effects of Interventions on Driving Related Attitudes

Mixed design ANOVAs were undertaken separately for the five driving-related attitude scales, with time (Time 1 and Time 2) as the within-groups variable and intervention group, experience and gender as the between groups variables (See Tables 22-26). No significant effects involving group were found for "Attitude to Fun-Riding", "Attitudes to traffic flow Vs Rule Obedience", or "Attitudes to injury reflection" scales. However, there was a significant three-way interaction between group, experience and time for the "Attitude to speeding" scale F (2, 213) = 3.65, $p = .028$. While further comparisons revealed that the simple effect of group did not reach statistical significance, F (2,213) = 2.57, $p = .08$, pairwise comparisons revealed a trend whereby more experienced drivers in the insight condition ($n = 39$) reported more favourable attitudes to speeding ($M = 2.33$, $SD = 0.93$) than their counterparts in the control condition ($n = 33$, $M = 1.89$, $SD = 0.68$) at Time 2 only (See Table 24). Furthermore, there was a significant multivariate main effect of group on attitudes to concern, $F(2,213) = 3.66$, $p = .03$, with post hoc tests revealing that those in the insight condition ($n = 76$) reported significantly less concern for others ($M = 4.24$, $SD = 0.71$) than those in the control group ($n = 72$, $M = 4.49$, $SD = 0.57$, $p = .008$) across both testing sessions (immediate testing session and three month follow-up).

When analyses were repeated excluding learner drivers, there was a significant interaction between time, intervention and experience for attitudes to fun-riding, $F(2, 195) = 3.55$, $p = 0.03$. Among less experienced (> 6 months, < 3.67 years of driving experience), unsupervised drivers, at Time 1 only, those in the accountability condition ($n = 30$, $M = 2.12$, $SD = 1.01$) reported more favourable attitudes to fun-riding than those in the control condition ($n = 33$, $M = 1.60$, $SD = 0.78$, $p = 0.01$) or those in the insight condition ($n = 32$, $M = 1.69$, $SD = 0.77$, $p = 0.03$).

Table 22

Main, Interaction and Simple Effects (Where Relevant) of Group, Gender, Time and Experience, on Attitudes to Fun-riding, Traffic Flow Vs Rule Obedience, Speeding, Injury Reflection and Concern for Hurting Others

	Source	*df*	F	Sig.	η_p^2
Att Fun (R)	Group	2	1.27	0.28	.012
	Group x Gender	2	0.06	0.95	.001
	Group x Experience	2	0.82	0.44	.008
	Group x Time	2	0.92	0.40	.009
	Group x Gen x Exp	2	1.57	0.22	.014
	Group x Gen x Time	2	0.16	0.85	.001
	Group x Exp x Time	2	2.03	0.13	.019
	Group x Gen x Exp x Time	2	0.82	0.44	.008
	Time	1	0.63	0.43	.003
	Gender	**1**	**10.71**	**0.00**	**.048**
	Experience	**1**	**4.55**	**0.03**	**.021**
	Gender x Experience	1	0.51	0.48	.014
	Time x Gender	1	1.24	0.27	.006
	Time x Experience	1	1.61	0.21	.008
	Time x Gender x Experience	1	2.23	0.14	.010
	Error	213			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Table 23

Main, Interaction and Simple Effects (Where Relevant) of Group, Gender, Time and Experience, on Attitudes Traffic Flow Vs Rule Obedience

	Source	*df*	F	Sig.	η_p^2
Att Flow	Group	2	1.92	0.15	.018
	Group x Gender	2	0.87	0.42	.008
	Group x Experience	2	0.65	0.52	.006
	Group x Time	2	1.08	0.34	.010
	Group x Gen x Exp	2	1.66	0.19	.015
	Group x Gen x Time	2	0.12	0.89	.001
	Group x Exp x Time	2	1.18	0.31	.011
	Group x Gen x Exp x Time	2	0.43	0.65	.004
	Time	1	0.08	0.78	<.001
	Gender	**1**	**13.11**	**<0.01**	**.058**
	Experience	1	0.29	0.59	.001
	Gender x Experience	1	0.24	0.23	.001
	Time x Gender	1	2.50	0.12	.012
	Time x Experience	1	1.27	0.26	.006
	Time x Gender x Experience	1	0.33	0.57	.002
	Error	213			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Table 24
Main, Interaction and Simple Effects (Where Relevant) of Group, Gender, Time and Experience, on Attitudes to Speeding

	Source		*df*	F	Sig.	η_p^2
Att Speed	Group		2	2.51	0.80	.023
	Group x Gender		2	2.15	0.12	.020
	Group x Experience		2	0.104	0.90	.001
	Group x Time		2	2.25	0.11	.021
	Group x Gen x Exp		2	0.93	0.40	.009
	Group x Gen x Time		2	0.34	0.71	.003
	Group x Exp x Time		**2**	**3.65**	**.028**	**.033**
		Simple effects of Time among more experienced drivers in the control group	**1**	**5.51**	**0.02**	**.025**
		Simple effects of Group among more experienced male drivers at Time 2 (Exploratory Trend)	*2*	*2.57*	*0.79*	*.024*
	Group x Gen x Exp x Time		2	1.00	0.37	.009
	Time		1	0.18	0.67	.001
	Gender		**1**	**7.66**	**0.01**	**.035**
	Experience		1	0.39	0.53	.002
	Gender x Experience		1	0.58	0.45	.003
	Time x Gender		1	1.42	0.24	.007
	Time x Experience		1	1.27	0.26	.006
	Time x Gender x Experience		1	2.12	0.15	.010
	Error		213			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Table 25

Main, Interaction and Simple Effects (Where Relevant) of Group, Gender, Time and Experience, on Attitudes to Injury Reflection

	Source	*df*	F	Sig.	η_p^2
Att Injury	Group	2	0.32	0.73	.003
	Group x Gender	2	0.22	0.81	.002
	Group x Experience	2	2.55	0.08	.023
	Group x Time	2	0.03	0.97	<.001
	Group x Gen x Exp	2	1.49	0.23	.014
	Group x Gen x Time	2	0.58	0.56	.005
	Group x Exp x Time	2	0.91	0.41	.008
	Group x Gen x Exp x Time	2	2.28	0.11	.021
	Time	1	0.39	0.53	.002
	Gender	**1**	**10.87**	**0.01**	**.049**
	Experience	1	1.84	0.18	.009
	Gender x Experience	1	0.75	0.39	.004
	Time x Gender	1	3.53	0.06	.016
	Time x Experience	1	0.99	0.32	.005
	Time x Gender x Experience	1	0.86	0.35	.004
	Error	213			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Table 26
Main, Interaction and Simple Effects (Where Relevant) of Group, Gender, Time and Experience, on Attitudes to Concern for Others

	Source		*df*	F	Sig.	η_p^2
Att Concern	**Group**		**2**	**3.66**	**0.03**	**.033**
	Group x Gender		2	1.63	0.20	.015
	Group x Experience		2	0.47	0.63	.004
	Group x Time		2	0.44	0.64	.004
	Group x Gen x Exp		2	0.81	0.45	.008
	Group x Gen x Time		2	1.11	0.33	.010
	Group x Exp x Time		2	0.29	0.75	.003
	Group x Gen x Exp x Time		2	0.08	0.93	.001
	Time		1	0.18	0.67	.001
	Gender		**1**	**42.39**	**<0.01**	**.166**
	Experience		1	0.24	0.63	.001
	Gender x Experience		**1**	**4.48**	**0.04**	**.021**
		Simple effect of gender among less experienced drivers	**1**	**36.10**	**<0.01**	**.145**
		Simple effect of gender among more experienced drivers	**1**	**9.96**	**<0.01**	**.045**
	Time x Gender		1	1.12	0.24	.004
	Time x Experience		1	1.27	0.26	.006
	Time x Gender x Experience		1	2.12	0.15	.010
	Error		213			

Note. Bold typeface indicates univariate follow up tests were significant at $p = .05$. Italic typeface indicates trend level significance, where pairwise comparisons were significant at $p = .05$, but univariate follow up tests were not significant at $p = .05$.

Effects of Time, Experience and Gender on Optimism Bias and Driving-Related Attitudes

There were several significant effects and interactions relating to gender, experience and time that were independent of group. For comprehensive details of gender, experience and time-related differences in driving-related optimism bias and attitudes, see Tables 15 to 26 and Appendices H to S.

3.3. DISCUSSION TIME 2

Time 2 aimed to examine objectives 3 and 4. The third objective of the study was to determine whether any effects of the accountability and insight interventions found at Time 1 would be sustained three months later or whether any new effects would emerge. Specifically, it was investigated whether (1) among less experienced drivers, those in the accountability condition still had lower specific accident risk-related optimism bias than controls three months after the initial intervention, (2) among more experienced males, those in the insight condition still had

more general accident risk-related optimism bias than control counterparts, (3) the insight intervention was still associated with reductions in concern for others, and (4) whether any new effects emerged at Time 2, that were not evident at Time 1.

The two effects of the accountability and insight interventions on driving-related optimism bias found at Time 1 were not evident at Time 2. This may be because the final analyses were based only on participants who completed both testing sessions (N = 227), whereas the analyses conducted immediately after Time 1 testing were based on the full sample (N = 242). The slightly reduced sample at Time 2, particularly for male subgroups, may have resulted in insufficient power to detect the effects in the final analyses. However, somewhat consistent with Time 1 findings, there was a trend for more experienced males in the insight condition to have lower accident risk perceptions (more optimism bias) than those in the control condition at Time 1 and 2; though this effect did not reach significance.

Consistent with Time 1 findings, there was a significant main effect of group on other driving-related attitudes both at Time 1 and at Time 2, where those exposed to the insight intervention reported significantly less concern for others, compared to control participants, both immediately and 3 months after the initial intervention. One possible explanation for this is that the hazard perception task drew participant's attention to the errors that other drivers make on the road, and in doing so led participants to feel less responsible for any potential accidents. No new effects of the interventions on driving-related attitudes emerged at Time 2 that were not evident at Time 1.

It is recognised that attitudes and optimism bias of learner drivers may not be representative of the general young driver population. As such, analyses were conducted with and without data from learner drivers included. Results were very similar between the two sets of analyses. However, two additional effects were found when learner drivers were excluded from the analyses. Firstly, among more experienced males, those in the accountability and insight conditions reported lower estimates of their comparative general accident risk (more optimism bias) than control participants. That is, the two interventions appeared to have a detrimental effect on general accident risk related optimism bias for more experienced males. Conversely, less-experienced males in the insight condition showed less optimism bias related to general accident risk (gave higher estimates of crash likelihood) than did less experienced males in the control group. Secondly, among less experienced, unsupervised males at Time 1 only, those in the accountability condition reported more favourable attitudes to fun riding than those in the control condition. The finding that new effects emerged when learners were excluded from analyses suggests that insight and accountability interventions may have effects (both positive and negative) on different subgroups of young drivers that are not evident when learner drivers are included.

The finding that the accountability intervention was ineffective at reducing skill and safety-related optimism bias was inconsistent with previous literature (e.g., McKenna & Myers, 1997). The inconsistency between the present findings and previous literature could be due to a number of factors, discussed at length in the discussion of the acute findings at Time 1 (pp. 18 – 21). Firstly, participants may not have perceived the experimenter to be a credible candidate to assess their driving performance (see Sedikides et al., 2002), as both testers were young females and participants were not lead to believe the testers had any expertise in the area of assessing driving skills. Secondly, participants may not have felt that the driving assessment was rigorous enough, or that their performance results were identifiable (Sedikides et al., 2002). Participants were not given any feedback on their performance and if they asked about their performance, they were told the data would be analysed comprehensively at another date.

This may have resulted in participants feeling anonymous, hence reducing the effectiveness of the accountability manipulation (Sedikides et al., 2002). These same reasons may be responsible for the apparent absence of effects at Time 2.

The finding that the insight manipulation did not reduce optimism bias in relation to driving skill or safety was also inconsistent with previous literature (e.g., Gregersen, 1996). Possible explanations for the inconsistency between the finding in previous research that insight manipulations can reduce some types of driving related optimism bias and the current study's findings are discussed at length in the Time 1 discussion. Briefly, reasons may include that previous studies have used practical based insight interventions (e.g., Gregersen, 1996) or have used theory based interventions that were longer in duration than the intervention used in the present study (e.g., Perrisol et al., 2009). Furthermore, the hazard perception task used in the current study may have possibly led participants to feel more equipped to deal with dangerous driving situations, resulting in higher optimism bias, similar to the effects of some skills-based training (Gregersen, 1996). Given that the interventions did not significantly reduce driving skill and safety-related optimism bias at Time 1; it is not surprising that no significant effects of intervention group were found at the three-month follow up. However, it is important to note that the final analyses suggest that two of the three non-significant trends (for less experienced male drivers to have less general accident risk related optimism bias and for more experienced male drivers in the insight condition to have lower general accident risk related optimism bias compared to controls) were sustained across time periods. The trend for more experienced males in the insight condition to have more accident risk related optimism bias was also evident at acute Time 1 testing. There were non-significant trends in the acute and final analyses to suggest that insight condition was associated with a decrease in accident-risk related optimism bias among less experienced young drivers. Given that the current sample was reasonably experienced (M = 4.08 years driving experience), this may explain why a significant effect was not found at Time 2.

The current study also aimed to determine whether the interventions impacted on participant's driving-related attitudes. Participants in the insight intervention condition reported less concern for others on the road than participants in the control condition, across Time 1 and Time 2. There have been few (if any) studies examining the effect of insight or accountability manipulations on driving-related attitudes. One possible explanation for the reduced concern for others among participants in the insight condition compared to those in the control condition might be that the insight intervention emphasised to participants that other drivers' manoeuvres could be unpredictable. In turn, this emphasis may have potentially led to participants believing that traffic crashes would likely be the fault of other drivers, potentially leading to a lack of concern for the safety of these other drivers. Similarly, there was a trend (though higher order comparisons were not significant) for more experienced males in the insight intervention to report more favourable (i.e., agree with) attitudes towards speeding behaviour than more experienced males in the control group, at both Time 1 and Time 2. Together, these findings tentatively suggest that some elements of the insight manipulation, or the hazard perception task specifically, may have detrimental effects on driving-related attitudes (particularly the participants' concern for other drivers). This effect may be similar to that of skill-based training, which has been found to make drivers feel less vulnerable on the road (Gregersen, 1996). Further research is required to determine whether reduced concern for other drivers' safety results in more risky or careless driving behaviour.

While the current study was robustly designed, there are several minor methodological limitations. First, not all participants completed the Time 2 survey immediately after being requested to do so, resulting in some variability in the amount of time between the initial and

follow-up sessions. A few participants completed the Time 2 questionnaire four weeks after they were asked to complete it. This variability may have led to some effects that may have been present after 3 months being undetected. Furthermore, as in many driving-related optimism bias studies, it was not assessed whether participants' estimates of their driving skill, safety and accident risk actually were optimistically biased compared to their actual skills, safety and accident risk, as this was beyond the scope of the present study. Another limitation is that due to the name of the study ("Reducing optimism bias in young novice drivers") participants may have attempted to provide responses consistent with their perceptions of the experimenter's expectations. After considering this limitation, an online questionnaire was used to assess optimism bias and attitudes at Time 2, in order to reduce the chances of response bias.

The current study contributes to existing literature by demonstrating the effect that insight manipulations may have on some types of driving-related attitudes and optimism bias both immediately and 3 to 4 months after the initial intervention. To the research team's knowledge, the current study is the first to examine the sustained effectiveness of interventions aiming to reduce driving-related optimism bias. Furthermore, current findings suggests that while brief versions of insight and accountability manipulations have limited capacity to reduce driving-related optimism bias across a general sample of young drivers, they may have some relevance to specific subgroups of young drivers. Further research is required to establish the effects of insight interventions on driving-related optimism bias, particularly insight interventions involving a hazard perception test as the method of insight, among larger samples of certain subgroups of young drivers (in particular, more experienced male drivers). Furthermore, negative effects of the interventions on driving related optimism bias and attitudes (particularly the insight manipulation) need to be further investigated, given the theorised influence of attitudes on driving behaviours. An evaluation is needed to determine whether other types of difficult hazard perception tasks (which may also provide participants with insight into their limitations as drivers) may have the same negative effects on attitudes and optimism bias as the insight manipulation used in the present study, especially when administered to drivers with more than 3.67 years of experience.

Results relating to the sustained effect of the accountability and insight interventions do not support the inclusion of such interventions into current licensing procedures for young drivers. The positive effect of the accountability intervention on inexperienced drivers' optimism bias was not sustained after three months. If the accountability intervention could be modified to result in a sustained positive effect, it may be beneficial to target it at inexperienced young drivers. On the other hand, the negative effect of the insight intervention on more experienced males' optimism bias was not sustained either, suggesting that insight based tasks may not have longer-term negative effects on driving-related optimism bias. However, there was a sustained (at three-month follow-up) negative effect on driving related attitudes (specifically attitudes towards concern for others) among those who were exposed to the insight intervention. Caution is thus required when using this type of insight task among young drivers. Before the current study's type of accountability intervention could be recommended to reduce optimism bias among more inexperienced young drivers, this task would need to be altered to achieve a more sustained effect.

4. FINAL SUMMARY

The present research aimed to determine whether insight or accountability interventions would be effective at reducing driving-related optimism bias and altering driving-related attitudes

both immediately and three months after the initial intervention. The first objective was to determine whether, compared to control participants, those in the insight and accountability conditions would show less driving-related optimism bias. Both acute between groups ANOVAs that were conducted immediately after completion of Time 1 testing (on the full sample of 242) and final mixed design ANOVAs that were conducted after the completion of Time 1 and Time 2 testing (on a reduced sample of 227 participants who completed questionnaires at both testing sessions), found that there were no significant main effects or interaction effects involving intervention group on optimism bias levels for the whole sample, either immediately or at a three-month follow-up. The initial analyses conducted after Time 1 testing found that there was a significant tendency for less experienced drivers in the accountability group to give higher estimates of perceived accident risk (less optimism bias) in specific situations than less experienced control participants. This suggests that accountability manipulations may immediately reduce optimism bias among less experienced drivers. However, this effect was not evident at Time 2, suggesting that any positive effects of the current accountability intervention for less experienced young drivers are not sustained after three months. Interestingly, more experienced male drivers in the insight intervention group displayed more optimism bias related to overall accident risk ratings, than did more experienced males in the control group. Acute findings from Time 1 suggest that both accountability and insight manipulations may have a significant effect on some types of optimism bias (specifically optimism bias related to accident risk) among certain subgroups of young drivers (in particular among less experienced and more experienced males in opposite directions). However, the final mixed design ANOVA completed after Time 2 (based on the reduced sample of 227 participants who completed both testing sessions) found no significant effects of intervention on any type of driving-related optimism bias, suggesting that the effects from Time 1 were not sustained. Importantly, non-significant findings in the Time 2 mixed design ANOVA may be due to reduced power resulting from the decrease in sample size. Alternatively, the current findings suggest that there were no sustained effects of the accountability or insight intervention.

The final analyses found two significant effects involving intervention group on driving-related optimism bias. However, simple effects did not reach significance for either of the two interactions. Significant pairwise comparisons indicated three trend-level effects. While these trends did not reach significance, two of the three trends were sustained across Time 1 and Time 2. That is, the trend for less experienced males in the insight intervention to show less accident risk related optimism bias than controls and the trend for more experienced males to report more accident risk related optimism bias, did not differ between Time 1 and Time 2. Interestingly, there was also a non-significant trend that was only evident at Time 2 for less experienced males in the insight intervention to show less optimism bias than their control counterparts. While these trends did not reach criteria for statistical significance, they suggest that differential effects of the insight manipulation may become evident if the intervention were tested in a larger sample of young male drivers of different experience levels. Importantly, these also suggest that in certain subgroups of young drivers, the insight manipulation may have the potential to have sustained and delayed effects on driving related optimism bias, both in desirable and undesirable directions.

Interestingly, when learners were excluded from the analyses across the two time periods, three new significant effects of group on driving-related optimism bias emerged. Firstly, among more experienced males, those in the accountability and insight interventions reported higher levels of optimism bias related to general accident risk than did control participants. Secondly, among less experienced males, those in the insight group showed less optimism bias (i.e., higher general accident risk) than did those in the control group. These findings firstly suggest

that learners may represent a different group of drivers in terms of their optimism bias related to general accident risk and may not be representative of the general young driver population, hence warranting a different approach in interventions aiming to reduce optimism bias. However, it is noted that the subgroup of learner drivers in this study was relatively small (n = 20) and therefore any conclusions regarding these drivers are tentative. Secondly, these findings suggest that unsupervised young drivers, particularly unsupervised young male drivers, respond differentially to the insight manipulation. Hence if accountability manipulations were implemented in the future, they should be targeted to appropriate subsets of young drivers.

Finally, the immediate and sustained impacts of the interventions on driving related attitudes were investigated. The final analyses revealed that there was only one significant effect of the interventions on driving related attitudes. Participants in the insight intervention showed less concern for others than did participants in the control condition, both immediately and three months after the initial intervention. Furthermore, there was also a significant group by experience by time interaction for attitudes to speeding. While further comparisons revealed there were no significant simple effects of intervention, significant lower-order pairwise comparisons indicated a trend for more experienced male drivers in the insight group to report more favourable attitudes to speeding (i.e., more likely to agree with such attitudes) than their counterparts in the control group. These findings are important, as driving attitudes may ultimately impact on driving behaviours. When learner drivers were excluded from the analysis a further effect on attitudes emerged, whereby among less experienced young drivers at Time 1 only, those in the accountability condition reported more favourable attitudes to fun-riding behaviour than their peers in the control condition.

The results of the present study do not support the inclusion of accountability and insight manipulations into current licensing procedures for novice drivers. The accountability manipulation used in the present study was associated with an immediate (though not sustained) decrease in optimism bias related to accident risk perceptions. However, among more experienced male drivers the insight manipulation was associated with an immediate (though not sustained) increase in general accident-risk related optimism bias. Furthermore, the insight intervention was associated with a decrease in concern for other drivers, both immediately and three months after the intervention. Final analyses also revealed a non-significant trend for more experienced male drivers in the insight intervention group to report more favourable attitudes toward speeding than their counterparts in the control group. The finding that the insight manipulation was associated with decreased concern for other drivers is particularly important given this manipulation's use of a hazard perception task. It is acknowledged that the hazard perception task used in the insight manipulation in the present study is not the same as the type of hazard perception task used in graduated licensing programs in Victoria and other jurisdictions. However, future research should investigate whether other types of hazard perception tasks show similar effects on driving-related attitudes. If so, then the nature of the relationship between attitudes and young drivers' actual driving behaviour should be examined.

In summary, present findings suggest that accountability and insight interventions may have the potential to effectively reduce optimism bias in some subgroups of young drivers (particularly less experienced young drivers), but may exacerbate optimism bias in others (for example, more experienced male drivers). In particular, the finding that the accountability intervention immediately reduced accident risk-related optimism bias in young drivers is promising. However, given that this effect was not sustained at three-month follow-up, further research is required to improve the accountability intervention so that this effect may be

sustained. Furthermore research is needed to establish the effects of accountability and insight interventions in specific groups of young drivers, in particular, inexperienced young drivers and more experienced male drivers. If the findings that insight manipulations may have negative effects on driving-related optimism bias and attitudes are replicated, further research is required to understand what elements of the insight manipulation contribute to this. If it is found that hazard perception tests increase driving-related optimism bias among more experienced drivers, this may provide an argument that hazard perception tests should be administered prior to the driver obtaining three years of driving experience. It should also be investigated whether other types of computer or simulation-based tasks could be used to provide young drivers with sufficient insight into their limitations as a driver to reduce optimism bias. Finally, future research should examine whether any changes in driving-related optimism bias or attitudes ultimately lead to changes in driving behaviour.

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APPENDIX A: RELEVANT MEASURES GIVEN TO PARTICIPANTS AT TIME 1 AND TIME 2 TESTING SESSIONS

Please answer the following questions as fully as possible by writing your answer in the blank space provided, or ticking the appropriate box.
Do not write your name on any of these pages, to ensure anonymity.
Your answers will remain confidential so please be honest.

ID code: _____

1. Gender ☐Male ☐Female

2. What is your age in years and months? _____years _____months

3. Place of Birth: In what country were you born? _____

4. Ethnic background: Which ethnic group do you most identify with? **(tick one)**

☐Aboriginal and/or Torres Strait Islander ☐Caucasian/European ☐Polynesian
☐Asian ☐Other (please write) _____

5. Transport: Which type of transport do you use most often **(tick one)?**

☐Public transport (bus, train, ferry, etc) ☐Private car (as passenger) ☐Private car (as driver)
☐Motorcycle ☐Walking ☐Cycling
☐Other (please write) _____

6. Driving History

a. Have you ever held an Australian driver's licence? ☐Yes ☐No

b. When did you first get your driving licence (year or age)? _____

c. How long have you been driving (in years and months)? _____years _____months
(this could include driving before you got your licence)

d. Which type of car licence do you currently hold?

☐Learner's Permit ☐Provisional 1 ☐Provisional 2 ☐Open ☐Suspended ☐Unlicensed

e. Approximately how many hours would you drive in an average week? _____hrs/wk

f. Approximately how many kilometres would you drive in an average week? _____km/wk

g. On which type of road do you usually drive most?

☐Only city/suburban roads ☐Mainly city/suburban roads ☐City/suburban AND country roads equally
☐Mainly country roads ☐Only country roads

h. Have you ever participated in advanced driver training (e.g. Defensive Driving Course, Driver Education Program)?

☐Yes (please give details) _____ ☐No

i. Have you ever lost your licence? ☐Yes (please give details below) ☐No

Reason for losing licence _____ Date (month/yr) _____

Reason for losing licence _____ Date (month/yr) _____

j. In the last month, have you received any traffic fines or loss of points (not including parking fines)?

☐Yes (please give details below) ☐No

Offence type (e.g., speeding>10km over) _____ Date (month/yr) _____

Offence type (e.g., speeding>10km over) _____ Date (month/yr) _____

k. In the last 12 months, have you received any traffic fines or loss of points (not including parking fines)?

☐Yes (please give details below) ☐No

Offence type _____ Date (month/yr) _____

Offence type _____ Date (month/yr) _____

7. Accident Involvement

a. In the last 12 months, have you been involved in a car accident in which you were driver?

☐Yes (please give details below) ☐No (go to question 7b)

i. Did you, or any passengers in the car you were driving, require hospitalisation due to an injury suffered in the accident?

☐Yes ☐No

ii. Did any drivers or passengers (outside of the car you were driving), pedestrians, or cyclists require hospitalisation due to an injury suffered in the accident?

☐Yes ☐No

iii. Did any of the vehicles involved require towing afterwards because of the accident?

☐Yes ☐No

b. In the last 12 months, have you been involved in a car accident in which you were the passenger?

☐Yes ☐No

c. How many car accidents have you been involved in where you were the driver? _____

This may include accidents in which other drivers/pedestrians are involved, as well as those accidents in which substantial damage occurred to the car, to private property, or to yourself even when no individuals other than yourself were involved (e.g. crashing into a building)

d. Do you own a car? ☐Yes (please give details below) ☐No

Make_____ Model_____ Year_____

For each of the following questions, please circle the number that BEST reflects your answer.

	Compared to a typical young driver…	Much less	Less	Somewhat less	The same	Somewhat more	More	Much more
1.	How skilful do you think you are as a driver?	1	2	3	4	5	6	7
2.	How safe do you think you are as a driver?	1	2	3	4	5	6	7
3.	Do you think you are more or less likely to be in an accident while you are the driver?	1	2	3	4	5	6	7

	Compared to a typical young driver, how skilful are you at…	Much less	Less	Somewhat less	The same	Somewhat more	More	Much more
4.	Navigating while driving in unfamiliar areas?	1	2	3	4	5	6	7
5.	Leaving motorways?	1	2	3	4	5	6	7
6.	Driving at an appropriate speed for conditions?	1	2	3	4	5	6	7
7.	Overtaking?	1	2	3	4	5	6	7
8.	Paying attention to other road users?	1	2	3	4	5	6	7
9.	Reversing?	1	2	3	4	5	6	7
10.	Parking?	1	2	3	4	5	6	7
11.	Changing traffic lanes?	1	2	3	4	5	6	7
12.	Three-point turns?	1	2	3	4	5	6	7
13.	Judging stopping distances?	1	2	3	4	5	6	7
14.	Paying attention to road signs?	1	2	3	4	5	6	7
15.	Moving onto motorways?	1	2	3	4	5	6	7
16.	Adjusting driving to suit weather conditions?	1	2	3	4	5	6	7
17.	Changing lanes on motorways?	1	2	3	4	5	6	7
18.	Judging correct approach speeds for bends?	1	2	3	4	5	6	7
19.	Driving in busy traffic?	1	2	3	4	5	6	7
20.	Spotting hazards quickly?	1	2	3	4	5	6	7
21.	Spotting hazards with enough time to react?	1	2	3	4	5	6	7
22.	Spotting numerous hazards at a time?	1	2	3	4	5	6	7
23.	Reacting to more than one potential hazard at a time?	1	2	3	4	5	6	7
24.	Spotting hazards in heavy traffic?	1	2	3	4	5	6	7

	Compared to a typical young driver, how skilful are you at…	Much less	Less	Somewhat less	The same	Somewhat more	More	Much more
25.	Spotting hazards in light traffic?	1	2	3	4	5	6	7

	Do you think you are more or less…compared to a typical young driver?	Much less	Less	Somewhat less	The same	Somewhat more	More	Much more
26.	Reckless	1	2	3	4	5	6	7
27.	Dangerous	1	2	3	4	5	6	7
28.	Risky	1	2	3	4	5	6	7
29.	Careless	1	2	3	4	5	6	7
30.	Responsible	1	2	3	4	5	6	7
31.	Careful	1	2	3	4	5	6	7
32.	Law-abiding	1	2	3	4	5	6	7
33.	Safe	1	2	3	4	5	6	7

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	When comparing myself to a typical young driver I would say the risk of getting into an accident when …	Much less	Less	Somewhat less	The same	Somewhat more	More	Much more
34.	I have to yield is…	1	2	3	4	5	6	7
35.	I drive in bad weather is…	1	2	3	4	5	6	7
36.	I cross an intersection with many visual elements (i.e. pedestrians, bikers, etc.) is…	1	2	3	4	5	6	7
37.	I have to change lanes on a highway with heavy traffic is…	1	2	3	4	5	6	7
38.	I have to quickly react to other drivers' unexpected manoeuvres is…	1	2	3	4	5	6	7
39.	I drive on a winding road is…	1	2	3	4	5	6	7
40.	I drive and I feel tired is…	1	2	3	4	5	6	7
41.	I drive at night is…	1	2	3	4	5	6	7
42.	I get onto a highway with heavy traffic is…	1	2	3	4	5	6	7

Indicate the extent to which you agree or disagree with each item		Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
74.	Young drivers have a need for fun and excitement in traffic	1	2	3	4	5
75.	There are many traffic rules that cannot be obeyed in order to keep up traffic flow	1	2	3	4	5
76.	I often think about how horrible it would be if I hurt someone else in traffic	1	2	3	4	5
77.	Sometimes it is necessary to bend the rules to keep traffic going	1	2	3	4	5
78.	Driving 10-15km/h over the speed limit is OK because everyone does it	1	2	3	4	5
79.	The risk of dying young in traffic is so low that you can ignore it	1	2	3	4	5
80.	Sometimes it is necessary to take chances in traffic	1	2	3	4	5
81.	If I would cause an accident where someone else was hurt it would scar me for life	1	2	3	4	5
82.	I could not live with myself if I hurt another human being in traffic	1	2	3	4	5
83.	Speeding and excitement belong together when you are driving	1	2	3	4	5
84.	It is more important to keep up the traffic flow than always follow the traffic rules	1	2	3	4	5
85.	If I should cause an accident where someone is hurt I hope I am the only one to get hurt	1	2	3	4	5
86.	It is better to drive smooth than always follow traffic rules	1	2	3	4	5
87.	It can never be excused to take a person's or an animal's life because of careless driving	1	2	3	4	5
88.	Sometimes it is necessary to bend the traffic rules in order to get ahead	1	2	3	4	5
89.	It is ok to drive 120km/h on a 90km/h road if there are no other cars around	1	2	3	4	5
90.	Driving off the road accidents are so rare that there is no need to worry	1	2	3	4	5
91.	Sometimes it is necessary to bend traffic rules to arrive in time	1	2	3	4	5
92.	For a safe driver it is acceptable to exceed the speed limit with 10km/h on a 70km/h road	1	2	3	4	5
93.	I hope I will never be involved in an accident of which I am the cause	1	2	3	4	5
94.	Driving is more than transportation, it also involves speeding and fun	1	2	3	4	5
95.	I often think about the possibility that I might get hurt in traffic	1	2	3	4	5

96.	**A person who takes chances and violates some traffic rules is not necessarily a less safe driver**	**1**	**2**	**3**	**4**	**5**
97.	**I often think about the possibility that I could injure someone else in traffic**	**1**	**2**	**3**	**4**	**5**
98.	**If you have good driving skills speeding is OK**	**1**	**2**	**3**	**4**	**5**
99.	**Sometimes it is necessary to ignore violations of traffic rules**	**1**	**2**	**3**	**4**	**5**
100.	**Drink driving is not so risky as people think it is**	**1**	**2**	**3**	**4**	**5**
101.	**It is OK to speed if the traffic conditions allow you to**	**1**	**2**	**3**	**4**	**5**

Thank you for your help! ☺

APPENDIX B: DESCRIPTIVE STATISTICS FOR OVERALL ESTIMATES OF PERCEIVED DRIVING SKILL, SAFETY AND ACCIDENT RISK – ACUTE TIME 1 ANALYSES

	Intervention	Gender	Experience	M	SD	N
General Skill	Control	Male	Less (<=3.67yrs) driving experience	5.00	0.94	10
			More (>3.67yrs) driving experience	5.45	0.82	11
			Total	5.23	0.89	21
		Female	Less (<=3.67yrs) driving experience	5.03	0.97	36
			More (>3.67yrs) driving experience	5.16	1.03	25
			Total	5.08	0.99	61
		Total	Less (<=3.67yrs) driving experience	5.02	0.95	46
			More (>3.67yrs) driving experience	5.25	0.97	36
			Total	5.12	0.96	82
	Insight	Male	Less (<=3.67yrs) driving experience	5.23	1.01	13
			More (>3.67yrs) driving experience	5.24	1.03	17
			Total	5.23	1.01	30
		Female	Less (<=3.67yrs) driving experience	4.36	1.19	25
			More (>3.67yrs) driving experience	5.04	0.91	24
			Total	4.69	1.10	49
		Total	Less (<=3.67yrs) driving experience	4.66	1.19	38
			More (>3.67yrs) driving experience	5.12	0.95	41
			Total	4.90	1.09	79
	Accountability	Male	Less (<=3.67yrs) driving experience	4.67	1.11	15
			More (>3.67yrs) driving experience	5.38	0.62	16
			Total	5.03	0.95	31
		Female	Less (<=3.67yrs) driving experience	4.43	1.31	23
			More (>3.67yrs) driving experience	5.09	1.11	27
			Total	4.79	1.24	50
		Total	Less (<=3.67yrs) driving experience	4.53	1.22	38
			More (>3.67yrs) driving experience	5.20	0.96	43
			Total	4.88	1.14	81
	Total	Male	Less (<=3.67yrs) driving experience	4.95	1.04	38
			More (>3.67yrs) driving experience	5.34	0.83	44
			Total	5.16	0.95	82
		Female	Less (<=3.67yrs) driving experience	4.67	1.17	84
			More (>3.67yrs) driving experience	5.10	1.01	76
			Total	4.87	1.11	160
		Total	Less (<=3.67yrs) driving experience	4.75	1.13	122

	Group	Gender	Experience	M	SD	N
General Skill	Total	Total	More (>3.67yrs) driving experience	5.19	0.95	120
			Total	4.97	1.07	242
General Safety	Control	Male	Less (<=3.67yrs) driving experience	5.70	1.06	10
			More (>3.67yrs) driving experience	5.73	1.35	11
			Total	5.71	1.19	21
		Female	Less (<=3.67yrs) driving experience	5.42	0.73	36
			More (>3.67yrs) driving experience	5.08	1.12	25
			Total	5.28	0.92	61
		Total	Less (<=3.67yrs) driving experience	5.48	0.81	46
			More (>3.67yrs) driving experience	5.28	1.21	36
			Total	5.39	1.00	82
	Insight	Male	Less (<=3.67yrs) driving experience	5.15	1.34	13
			More (>3.67yrs) driving experience	5.71	0.92	17
			Total	5.47	1.14	30
		Female	Less (<=3.67yrs) driving experience	5.08	1.12	25
			More (>3.67yrs) driving experience	5.21	0.93	24
			Total	5.14	1.02	49
		Total	Less (<=3.67yrs) driving experience	5.11	1.18	38
			More (>3.67yrs) driving experience	5.41	0.95	41
			Total	5.27	1.07	79
	Accountability	Male	Less (<=3.67yrs) driving experience	4.80	1.37	15
			More (>3.67yrs) driving experience	5.50	0.82	16
			Total	5.16	1.16	31
		Female	Less (<=3.67yrs) driving experience	4.96	1.30	23
			More (>3.67yrs) driving experience	5.54	0.87	27
			Total	5.27	1.11	50
		Total	Less (<=3.67yrs) driving experience	4.89	1.31	38
			More (>3.67yrs) driving experience	5.52	0.84	43
			Total	5.23	1.12	81
	Total	Male	Less (<=3.67yrs) driving experience	5.16	1.31	38
			More (>3.67yrs) driving experience	5.64	0.99	44
			Total	5.41	1.16	82
		Female	Less (<=3.67yrs) driving experience	5.19	1.04	84
			More (>3.67yrs) driving experience	5.28	0.98	76
			Total	5.23	1.01	160
		Total	Less (<=3.67yrs) driving experience	5.18	1.12	122
			More (>3.67yrs) driving experience	5.41	1.00	120
			Total	5.30	1.06	242

	Group	Gender	Experience	M	SD	N
General Accident Risk	Control	Male	Less (<=3.67yrs) driving experience	2.90	1.37	10
			More (>3.67yrs) driving experience	3.64	1.75	11
			Total	3.29	1.59	21
		Female	Less (<=3.67yrs) driving experience	3.33	1.39	36
			More (>3.67yrs) driving experience	3.08	1.55	25
			Total	3.23	1.45	61
		Total	Less (<=3.67yrs) driving experience	3.24	1.39	46
			More (>3.67yrs) driving experience	3.25	1.61	36
			Total	3.24	1.48	82
	Insight	Male	Less (<=3.67yrs) driving experience	3.85	1.86	13
			More (>3.67yrs) driving experience	2.29	1.05	17
			Total	2.97	1.63	30
		Female	Less (<=3.67yrs) driving experience	3.12	1.27	25
			More (>3.67yrs) driving experience	3.04	1.20	24
			Total	3.08	1.22	49
		Total	Less (<=3.67yrs) driving experience	3.37	1.51	38
			More (>3.67yrs) driving experience	2.73	1.18	41
			Total	3.04	1.38	79
	Accountability	Male	Less (<=3.67yrs) driving experience	3.67	1.45	15
			More (>3.67yrs) driving experience	3.31	1.85	16
			Total	3.48	1.65	31
		Female	Less (<=3.67yrs) driving experience	3.22	1.44	23
			More (>3.67yrs) driving experience	2.81	1.21	27
			Total	3.00	1.32	50
		Total	Less (<=3.67yrs) driving experience	3.39	1.44	38
			More (>3.67yrs) driving experience	3.00	1.48	43
			Total	3.19	1.47	81
	Total	Male	Less (<=3.67yrs) driving experience	3.53	1.59	38
			More (>3.67yrs) driving experience	3.00	1.63	44
			Total	3.24	1.62	82
		Female	Less (<=3.67yrs) driving experience	3.24	1.36	84
			More (>3.67yrs) driving experience	2.97	1.32	76
			Total	3.11	1.34	160
		Total	Less (<=3.67yrs) driving experience	3.33	1.43	122
			More (>3.67yrs) driving experience	2.98	1.43	120
			Total	3.16	1.44	242

APPENDIX C: DESCRIPTIVE STATISTICS FOR ESTIMATES OF PERCEIVED SPECIFIC DRIVING SKILLS – ACUTE TIME 1 ANALYSES

Group	Gender	Experience	M	SD	N
Control	Male	Less (<=3.67yrs) driving experience	5.27	0.63	10
		More (>3.67yrs) driving experience	5.20	0.73	11
		Total	5.24	0.67	21
	Female	Less (<=3.67yrs) driving experience	4.82	0.72	36
		More (>3.67yrs) driving experience	5.02	0.88	25
		Total	4.90	0.79	61
	Total	Less (<=3.67yrs) driving experience	4.92	0.72	46
		More (>3.67yrs) driving experience	5.07	0.83	36
		Total	4.99	0.77	82
Insight	Male	Less (<=3.67yrs) driving experience	5.00	1.04	13
		More (>3.67yrs) driving experience	5.17	0.80	17
		Total	5.09	0.90	30
	Female	Less (<=3.67yrs) driving experience	4.60	0.81	25
		More (>3.67yrs) driving experience	4.95	0.73	24
		Total	4.77	0.79	49
	Total	Less (<=3.67yrs) driving experience	4.74	0.90	38
		More (>3.67yrs) driving experience	5.04	0.76	41
		Total	4.89	0.84	79
Accountability	Male	Less (<=3.67yrs) driving experience	4.65	0.84	15
		More (>3.67yrs) driving experience	5.24	0.66	16
		Total	4.96	0.80	31
	Female	Less (<=3.67yrs) driving experience	4.71	0.87	23
		More (>3.67yrs) driving experience	5.18	0.95	27
		Total	4.97	0.94	50
	Total	Less (<=3.67yrs) driving experience	4.69	0.85	38
		More (>3.67yrs) driving experience	5.20	0.85	43
		Total	4.96	0.88	81
Total	Male	Less (<=3.67yrs) driving experience	4.93	0.88	38
		More (>3.67yrs) driving experience	5.20	0.72	44
		Total	5.08	0.80	82
	Female	Less (<=3.67yrs) driving experience	4.73	0.79	84
		More (>3.67yrs) driving experience	5.06	0.86	76
		Total	4.88	0.84	160
	Total	Less (<=3.67yrs) driving experience	4.79	0.82	122
		More (>3.67yrs) driving experience	5.11	0.81	120
		Total	4.95	0.83	242

APPENDIX D: DESCRIPTIVE STATISTICS FOR HAZARD PERCEPTION SKILLS – ACUTE TIME 1 ANALYSES

Group	Gender	Experience	M	SD	N
Control	Male	Less (<=3.67yrs) driving experience	4.57	0.91	10.00
		More (>3.67yrs) driving experience	5.56	0.84	11.00
		Total	5.09	0.99	21.00
	Female	Less (<=3.67yrs) driving experience	4.65	0.85	36.00
		More (>3.67yrs) driving experience	4.71	1.14	25.00
		Total	4.68	0.97	61.00
	Total	Less (<=3.67yrs) driving experience	4.63	0.86	46.00
		More (>3.67yrs) driving experience	4.97	1.11	36.00
		Total	4.78	0.99	82.00
Insight	Male	Less (<=3.67yrs) driving experience	4.95	1.33	13.00
		More (>3.67yrs) driving experience	5.13	0.82	17.00
		Total	5.05	1.05	30.00
	Female	Less (<=3.67yrs) driving experience	4.19	0.77	25.00
		More (>3.67yrs) driving experience	4.58	0.91	24.00
		Total	4.38	0.86	49.00
	Total	Less (<=3.67yrs) driving experience	4.45	1.05	38.00
		More (>3.67yrs) driving experience	4.81	0.90	41.00
		Total	4.64	0.99	79.00
Accountability	Male	Less (<=3.67yrs) driving experience	4.67	1.22	15.00
		More (>3.67yrs) driving experience	4.87	0.81	16.00
		Total	4.78	1.02	31.00
	Female	Less (<=3.67yrs) driving experience	4.57	0.97	23.00
		More (>3.67yrs) driving experience	4.92	1.11	27.00
		Total	4.76	1.06	50.00
	Total	Less (<=3.67yrs) driving experience	4.61	1.06	38.00
		More (>3.67yrs) driving experience	4.90	1.00	43.00
		Total	4.77	1.03	81.00
Total	Male	Less (<=3.67yrs) driving experience	4.74	1.17	38.00
		More (>3.67yrs) driving experience	5.14	0.85	44.00
		Total	4.96	1.02	82.00
	Female	Less (<=3.67yrs) driving experience	4.49	0.88	84.00
		More (>3.67yrs) driving experience	4.75	1.06	76.00
		Total	4.61	0.97	160.00
	Total	Less (<=3.67yrs) driving experience	4.57	0.98	122.00
		More (>3.67yrs) driving experience	4.89	1.00	120.00
		Total	4.73	1.00	242.00

APPENDIX E: DESCRIPTIVE STATISTICS FOR PERCIEVED CAUTION: ACUTE TIME 1 ANALYSES

Group	Gender	Experience	M	SD	N
Control	Male	Less (<=3.67yrs) driving experience	5.31	0.97	10
		More (>3.67yrs) driving experience	5.30	1.19	11
		Total	5.30	1.06	21
	Female	Less (<=3.67yrs) driving experience	5.60	0.76	36
		More (>3.67yrs) driving experience	5.25	1.09	25
		Total	5.45	0.92	61
	Total	Less (<=3.67yrs) driving experience	5.54	0.81	46
		More (>3.67yrs) driving experience	5.26	1.10	36
		Total	5.41	0.95	82
Insight	Male	Less (<=3.67yrs) driving experience	4.80	0.91	13
		More (>3.67yrs) driving experience	5.38	0.95	17
		Total	5.13	0.96	30
	Female	Less (<=3.67yrs) driving experience	5.44	0.98	25
		More (>3.67yrs) driving experience	5.54	0.65	24
		Total	5.49	0.82	49
	Total	Less (<=3.67yrs) driving experience	5.22	0.99	38
		More (>3.67yrs) driving experience	5.47	0.78	41
		Total	5.35	0.89	79
Accountability	Male	Less (<=3.67yrs) driving experience	4.57	0.77	15
		More (>3.67yrs) driving experience	5.24	0.70	16
		Total	4.92	0.80	31
	Female	Less (<=3.67yrs) driving experience	5.21	1.03	23
		More (>3.67yrs) driving experience	5.55	0.74	27
		Total	5.40	0.89	50
	Total	Less (<=3.67yrs) driving experience	4.96	0.98	38
		More (>3.67yrs) driving experience	5.44	0.74	43
		Total	5.21	0.89	81
Total	Male	Less (<=3.67yrs) driving experience	4.84	0.90	38
		More (>3.67yrs) driving experience	5.31	0.92	44
		Total	5.09	0.93	82
	Female	Less (<=3.67yrs) driving experience	5.44	0.91	84
		More (>3.67yrs) driving experience	5.45	0.85	76
		Total	5.45	0.88	160
	Total	Less (<=3.67yrs) driving experience	5.26	0.95	122
		More (>3.67yrs) driving experience	5.40	0.87	120
		Total	5.33	0.91	242

APPENDIX F: DESCRIPTIVE STATISTICS FOR PERCEIVED ACCIDENT RISK IN SPECIFIC SITUATIONS: ACUTE TIME 1 ANALYSES

Group	Gender	Experience	M	SD	N
Control	Male	Less (<=3.67yrs) driving experience	3.14	0.89	10
		More (>3.67yrs) driving experience	3.07	1.01	11
		Total	3.11	0.93	21
	Female	Less (<=3.67yrs) driving experience	3.26	0.75	36
		More (>3.67yrs) driving experience	3.51	0.89	25
		Total	3.36	0.81	61
	Total	Less (<=3.67yrs) driving experience	3.23	0.77	46
		More (>3.67yrs) driving experience	3.38	0.94	36
		Total	3.30	0.85	82
Insight	Male	Less (<=3.67yrs) driving experience	3.07	1.25	13
		More (>3.67yrs) driving experience	2.90	0.93	17
		Total	2.97	1.06	30
	Female	Less (<=3.67yrs) driving experience	3.56	0.96	25
		More (>3.67yrs) driving experience	3.50	0.81	24
		Total	3.53	0.88	49
	Total	Less (<=3.67yrs) driving experience	3.39	1.08	38
		More (>3.67yrs) driving experience	3.25	0.90	41
		Total	3.32	0.99	79
Accountability	Male	Less (<=3.67yrs) driving experience	3.76	0.93	15
		More (>3.67yrs) driving experience	2.84	0.78	16
		Total	3.28	0.96	31
	Female	Less (<=3.67yrs) driving experience	3.78	0.84	23
		More (>3.67yrs) driving experience	3.13	0.88	27
		Total	3.43	0.91	50
	Total	Less (<=3.67yrs) driving experience	3.77	0.86	38
		More (>3.67yrs) driving experience	3.02	0.85	43
		Total	3.37	0.93	81
Total	Male	Less (<=3.67yrs) driving experience	3.36	1.06	38
		More (>3.67yrs) driving experience	2.92	0.88	44
		Total	3.12	0.99	82
	Female	Less (<=3.67yrs) driving experience	3.49	0.86	84
		More (>3.67yrs) driving experience	3.37	0.87	76
		Total	3.43	0.86	160
	Total	Less (<=3.67yrs) driving experience	3.45	0.92	122
		More (>3.67yrs) driving experience	3.21	0.90	120
		Total	3.33	0.92	242

APPENDIX G: DESCRIPTIVE STATISTICS FOR DRIVING RELATED ATTITUDES – ACUTE TIME 1 ANALYSES

	Group	Gender	Experience	M	SD	N
Attitudes to Fun-riding	Control	Male	Less (<=3.67yrs) driving experience	1.80	0.54	10
			More (>3.67yrs) driving experience	2.00	0.89	11
			Total	1.90	0.74	21
		Female	Less (<=3.67yrs) driving experience	1.54	0.79	36
			More (>3.67yrs) driving experience	1.44	0.44	25
			Total	1.50	0.66	61
		Total	Less (<=3.67yrs) driving experience	1.60	0.74	46
			More (>3.67yrs) driving experience	1.61	0.66	36
			Total	1.60	0.70	82
	Insight	Male	Less (<=3.67yrs) driving experience	2.12	0.77	13
			More (>3.67yrs) driving experience	1.76	0.64	17
			Total	1.92	0.71	30
		Female	Less (<=3.67yrs) driving experience	1.44	0.62	25
			More (>3.67yrs) driving experience	1.71	0.75	24
			Total	1.57	0.69	49
		Total	Less (<=3.67yrs) driving experience	1.67	0.74	38
			More (>3.67yrs) driving experience	1.73	0.70	41
			Total	1.70	0.71	79
	Accountability	Male	Less (<=3.67yrs) driving experience	2.30	0.82	15
			More (>3.67yrs) driving experience	2.00	0.66	16
			Total	2.15	0.74	31
		Female	Less (<=3.67yrs) driving experience	1.98	1.15	23
			More (>3.67yrs) driving experience	1.33	0.44	27
			Total	1.63	0.90	50
		Total	Less (<=3.67yrs) driving experience	2.11	1.03	38
			More (>3.67yrs) driving experience	1.58	0.62	43
			Total	1.83	0.87	81
	Total	Male	Less (<=3.67yrs) driving experience	2.11	0.75	38
			More (>3.67yrs) driving experience	1.91	0.71	44
			Total	2.00	0.73	82
		Female	Less (<=3.67yrs) driving experience	1.63	0.88	84
			More (>3.67yrs) driving experience	1.49	0.57	76
			Total	1.56	0.75	160
		Total	Less (<=3.67yrs) driving experience	1.78	0.86	122
			More (>3.67yrs) driving experience	1.64	0.66	120
			Total	1.71	0.77	242

	Group	Gender	Experience	M	SD	N
Attitudes to Traffic Flow Vs Obedience	Control	Male	Less (<=3.67yrs) driving experience	2.30	0.66	10
			More (>3.67yrs) driving experience	2.86	0.66	11
			Total	2.59	0.70	21
		Female	Less (<=3.67yrs) driving experience	2.25	0.64	36
			More (>3.67yrs) driving experience	2.37	0.57	25
			Total	2.30	0.61	61
		Total	Less (<=3.67yrs) driving experience	2.26	0.63	46
			More (>3.67yrs) driving experience	2.52	0.63	36
			Total	2.37	0.64	82
	Insight	Male	Less (<=3.67yrs) driving experience	2.94	0.57	13
			More (>3.67yrs) driving experience	2.73	0.79	17
			Total	2.82	0.70	30
		Female	Less (<=3.67yrs) driving experience	2.20	0.78	25
			More (>3.67yrs) driving experience	2.37	0.73	24
			Total	2.28	0.75	49
		Total	Less (<=3.67yrs) driving experience	2.45	0.80	38
			More (>3.67yrs) driving experience	2.51	0.77	41
			Total	2.48	0.78	79
	Accountability	Male	Less (<=3.67yrs) driving experience	2.86	0.60	15
			More (>3.67yrs) driving experience	2.88	0.52	16
			Total	2.87	0.55	31
		Female	Less (<=3.67yrs) driving experience	2.50	0.65	23
			More (>3.67yrs) driving experience	2.32	0.56	27
			Total	2.40	0.61	50
		Total	Less (<=3.67yrs) driving experience	2.64	0.65	38
			More (>3.67yrs) driving experience	2.53	0.61	43
			Total	2.58	0.63	81
	Total	Male	Less (<=3.67yrs) driving experience	2.74	0.65	38
			More (>3.67yrs) driving experience	2.82	0.66	44
			Total	2.78	0.65	82
		Female	Less (<=3.67yrs) driving experience	2.30	0.69	84
			More (>3.67yrs) driving experience	2.35	0.61	76
			Total	2.33	0.65	160
		Total	Less (<=3.67yrs) driving experience	2.44	0.71	122
			More (>3.67yrs) driving experience	2.52	0.67	120
			Total	2.48	0.69	242
Attitudes to Injury Reflection	Control	Male	Less (<=3.67yrs) driving experience	3.47	0.57	10
			More (>3.67yrs) driving experience	3.73	0.63	11
			Total	3.60	0.60	21
		Female	Less (<=3.67yrs) driving experience	3.66	0.92	36
			More (>3.67yrs) driving experience	3.68	0.88	25
			Total	3.67	0.90	61
		Total	Less (<=3.67yrs) driving experience	3.62	0.86	46
			More (>3.67yrs) driving experience	3.69	0.81	36
			Total	3.65	0.83	82
	Insight	Male	Less (<=3.67yrs) driving experience	3.21	0.79	13

	Group	Gender	Experience	M	SD	N
	Insight	Male	More (>3.67yrs) driving experience	3.51	0.82	17
			Total	3.38	0.81	30
		Female	Less (<=3.67yrs) driving experience	3.91	0.54	25
			More (>3.67yrs) driving experience	3.54	0.65	24
			Total	3.73	0.62	49
		Total	Less (<=3.67yrs) driving experience	3.67	0.71	38
			More (>3.67yrs) driving experience	3.53	0.71	41
			Total	3.59	0.71	79
	Accountability	Male	Less (<=3.67yrs) driving experience	3.44	0.91	15
			More (>3.67yrs) driving experience	3.14	1.04	16
			Total	3.28	0.98	31
		Female	Less (<=3.67yrs) driving experience	3.90	0.86	23
			More (>3.67yrs) driving experience	3.46	1.00	27
			Total	3.66	0.96	50
		Total	Less (<=3.67yrs) driving experience	3.72	0.90	38
			More (>3.67yrs) driving experience	3.34	1.02	43
			Total	3.52	0.98	81
	Total	Male	Less (<=3.67yrs) driving experience	3.37	0.78	38
			More (>3.67yrs) driving experience	3.43	0.88	44
			Total	1.80	0.54	82
		Female	Less (<=3.67yrs) driving experience	2.00	0.89	84
			More (>3.67yrs) driving experience	1.90	0.74	76
			Total	1.54	0.79	160
		Total	Less (<=3.67yrs) driving experience	1.44	0.44	122
			More (>3.67yrs) driving experience	1.50	0.66	120
			Total	1.60	0.74	242
Attitudes to Speed	Control	Male	Less (<=3.67yrs) driving experience	1.61	0.66	10
			More (>3.67yrs) driving experience	1.60	0.70	11
			Total	2.12	0.77	21
		Female	Less (<=3.67yrs) driving experience	1.76	0.64	36
			More (>3.67yrs) driving experience	1.92	0.71	25
			Total	1.44	0.62	61
		Total	Less (<=3.67yrs) driving experience	1.71	0.75	46
			More (>3.67yrs) driving experience	1.57	0.69	36
			Total	1.67	0.74	82
	Insight	Male	Less (<=3.67yrs) driving experience	1.73	0.70	13
			More (>3.67yrs) driving experience	1.70	0.71	17
			Total	2.30	0.82	30
		Female	Less (<=3.67yrs) driving experience	2.00	0.66	25
			More (>3.67yrs) driving experience	2.15	0.74	24
			Total	1.98	1.15	49
		Total	Less (<=3.67yrs) driving experience	1.33	0.44	38
			More (>3.67yrs) driving experience	1.63	0.90	41

			Total	2.11	1.03	79
	Accountability	Male	Less (<=3.67yrs) driving experience	1.58	0.62	15
			More (>3.67yrs) driving experience	1.83	0.87	16
			Total	2.11	0.75	31
		Female	Less (<=3.67yrs) driving experience	1.91	0.71	23
			More (>3.67yrs) driving experience	2.00	0.73	27
			Total	1.63	0.88	50
		Total	Less (<=3.67yrs) driving experience	1.49	0.57	38
			More (>3.67yrs) driving experience	1.56	0.75	43
			Total	1.78	0.86	81
	Total	Male	Less (<=3.67yrs) driving experience	1.64	0.66	38
			More (>3.67yrs) driving experience	1.71	0.77	44
			Total	2.30	0.66	82
		Female	Less (<=3.67yrs) driving experience	2.86	0.66	84
			More (>3.67yrs) driving experience	2.59	0.70	76
			Total	2.25	0.64	160
		Total	Less (<=3.67yrs) driving experience	2.37	0.57	122
			More (>3.67yrs) driving experience	2.30	0.61	120
			Total	2.26	0.63	242
Attitudes to Concern for Others	Control	Male	Less (<=3.67yrs) driving experience	2.52	0.63	10
			More (>3.67yrs) driving experience	2.37	0.64	11
			Total	2.94	0.57	21
		Female	Less (<=3.67yrs) driving experience	2.73	0.79	36
			More (>3.67yrs) driving experience	2.82	0.70	25
			Total	2.20	0.78	61
		Total	Less (<=3.67yrs) driving experience	2.37	0.73	46
			More (>3.67yrs) driving experience	2.28	0.75	36
			Total	2.45	0.80	82
	Insight	Male	Less (<=3.67yrs) driving experience	2.51	0.77	13
			More (>3.67yrs) driving experience	2.48	0.78	17
			Total	2.86	0.60	30
		Female	Less (<=3.67yrs) driving experience	2.88	0.52	25
			More (>3.67yrs) driving experience	2.87	0.55	24
			Total	2.50	0.65	49
		Total	Less (<=3.67yrs) driving experience	2.32	0.56	38
			More (>3.67yrs) driving experience	2.40	0.61	41
			Total	2.64	0.65	79
	Accountability	Male	Less (<=3.67yrs) driving experience	2.53	0.61	15
			More (>3.67yrs) driving experience	2.58	0.63	16
			Total	2.74	0.65	31
		Female	Less (<=3.67yrs) driving experience	2.82	0.66	23
			More (>3.67yrs) driving experience	2.78	0.65	27
			Total	2.30	0.69	50
		Total	Less (<=3.67yrs) driving experience	2.35	0.61	38
			More (>3.67yrs) driving experience	2.33	0.65	43

			Total	2.44	0.71	81
	Total	Male	Less (<=3.67yrs) driving experience	2.52	0.67	38
	Group	Gender	Experience	M	SD	N
Attitudes to Concern	Total	Male	More (>3.67yrs) driving experience	2.48	0.69	44
			Total	3.47	0.57	82
		Female	Less (<=3.67yrs) driving experience	3.73	0.63	84
			More (>3.67yrs) driving experience	3.60	0.60	76
			Total	3.66	0.92	160
		Total	Less (<=3.67yrs) driving experience	3.68	0.88	122
			More (>3.67yrs) driving experience	3.67	0.90	120
			Total	3.62	0.86	242

APPENDIX H: DESCRIPTIVE STATISTICS FOR OVERALL ESTIMATES OF PERCEIVED DRIVER SKILL – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
General Skill Estimates Time 1	Control	Male	Less experience	5.11	0.93	9
			More experience	5.63	0.74	8
			Total	5.35	0.86	17
		Female	Less experience	5.00	0.97	31
			More experience	5.25	0.94	24
			Total	5.11	0.96	55
		Total	Less experience	5.03	0.95	40
			More experience	5.34	0.90	32
			Total	5.17	0.93	72
	Insight	Male	Less experience	5.17	1.03	12
			More experience	5.24	1.03	17
			Total	5.21	1.01	29
		Female	Less experience	4.36	1.19	25
			More experience	5.05	0.95	22
			Total	4.68	1.12	47
		Total	Less experience	4.62	1.19	37
			More experience	5.13	0.98	39
			Total	4.88	1.11	76
	Accountability	Male	Less experience	4.64	1.15	14
			More experience	5.36	0.63	14
			Total	5.00	0.98	28
		Female	Less experience	4.43	1.36	21
			More experience	5.09	1.11	27
			Total	4.80	1.26	48
		Total	Less experience	4.51	1.27	35
			More experience	5.18	0.97	41
			Total	4.88	1.16	76
	Total	Male	Less experience	4.94	1.06	35
			More experience	5.36	0.84	39
			Total	5.16	0.97	74
		Female	Less experience	4.64	1.18	77
			More experience	5.13	1.00	73
			Total	4.88	1.12	150
		Total	Less experience	4.73	1.15	112
			More experience	5.21	0.95	112
			Total	4.97	1.08	224
General Skill Estimates Time 2	Control	Male	Less experience	5.22	0.67	9
			More experience	5.62	0.92	8
			Total	5.41	0.80	17
		Female	Less experience	4.58	1.03	31
			More experience	5.21	1.25	24
			Total	4.85	1.16	55
		Total	Less experience	4.73	0.99	40
			More experience	5.31	1.18	32
			Total	4.99	1.11	72
	Insight	Male	Less experience	5.33	1.07	12
			More experience	5.41	0.94	17
			Total	5.38	0.98	29
		Female	Less experience	4.24	0.88	25
			More experience	5.05	1.00	22

	Group	Gender	Experience	M	SD	N
General Skill Estimates Time 2	Insight		Total	4.62	1.01	47
		Total	Less experience	4.59	1.07	37
			More experience	5.21	0.98	39
			Total	4.91	1.06	76
	Accountability	Male	Less experience	4.64	1.08	14
			More experience	5.50	0.86	14
			Total	5.07	1.05	28
		Female	Less experience	4.76	0.94	21
			More experience	5.22	1.16	27
			Total	5.02	1.08	48
		Total	Less experience	4.71	0.99	35
			More experience	5.32	1.06	41
			Total	5.04	1.06	76
	Total	Male	Less experience	5.03	1.01	35
			More experience	5.49	0.89	39
			Total	5.27	0.97	74
		Female	Less experience	4.52	0.97	77
			More experience	5.16	1.13	73
			Total	4.83	1.10	150
		Total	Less experience	4.68	1.01	112
			More experience	5.28	1.06	112
			Total	4.98	1.07	224

APPENDIX I: DESCRIPTIVE STATISTICS FOR OVERALL COMPARATIVE ESTIMATES OF PERCEIVED DRIVER SAFETY – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
General Safety Estimates Time 1	Control	Male	Less experience	5.67	1.12	9
			More experience	5.67	1.50	9
			Total	5.67	1.28	18
		Female	Less experience	5.44	0.72	32
			More experience	5.13	1.06	23
			Total	5.31	0.88	55
		Total	Less experience	5.49	0.81	41
			More experience	5.28	1.20	32
			Total	5.40	1.00	73
	Insight	Male	Less experience	5.08	1.38	12
			More experience	5.71	0.92	17
			Total	5.45	1.15	29
		Female	Less experience	5.08	1.14	24
			More experience	5.10	0.94	21
			Total	5.09	1.04	45
		Total	Less experience	5.08	1.20	36
			More experience	5.37	0.97	38
			Total	5.23	1.09	74
	Accountability	Male	Less experience	5.00	1.18	14
			More experience	5.43	0.85	14
			Total	5.21	1.03	28
		Female	Less experience	5.00	1.31	22
			More experience	5.54	0.87	27
			Total	5.30	1.11	49
		Total	Less experience	5.00	1.24	36
			More experience	5.50	0.85	41
			Total	5.27	1.07	77
	Total	Male	Less experience	5.20	1.23	35
			More experience	5.60	1.03	40
			Total	5.41	1.14	75
		Female	Less experience	5.21	1.05	78
			More experience	5.27	0.96	71
			Total	5.24	1.01	149
		Total	Less experience	5.20	1.10	113
			More experience	5.39	1.00	111
			Total	5.30	1.05	224
General Safety Estimates Time 2	Control	Male	Less experience	5.33	1.12	9
			More experience	5.44	1.01	9
			Total	5.39	1.04	18
		Female	Less experience	5.03	1.06	32
			More experience	5.04	1.33	23
			Total	5.04	1.17	55
		Total	Less experience	5.10	1.07	41
			More experience	5.16	1.25	32
			Total	5.12	1.14	73
	Insight	Male	Less experience	5.00	1.04	12
			More experience	5.71	0.59	17
			Total	5.41	0.87	29
		Female	Less experience	5.04	0.96	24
			More experience	5.19	1.08	21
			Total	5.11	1.01	45

		Total	Less experience	5.03	0.97	36
			More experience	5.42	0.92	38
			Total	5.23	0.96	74
	Accountability	Male	Less experience	5.00	1.30	14
			More experience	5.43	0.65	14
			Total	5.21	1.03	28
		Female	Less experience	5.18	1.05	22
			More experience	5.44	1.09	27
			Total	5.33	1.07	49
		Total	Less experience	5.11	1.14	36
			More experience	5.44	0.95	41
			Total	5.29	1.05	77
	Total	Male	Less experience	5.09	1.15	35
			More experience	5.55	0.71	40
			Total	5.33	0.96	75
		Female	Less experience	5.08	1.02	78
			More experience	5.24	1.17	71
			Total	5.15	1.09	149
		Total	Less experience	5.08	1.05	113
			More experience	5.35	1.03	111
			Total	5.21	1.05	224

APPENDIX J: DESCRIPTIVE STATISTICS FOR OVERALL COMPARATIVE ESTIMATES OF PERCEIVED DRIVER ACCIDENT RISK – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
General Accident Risk Estimates Time 1	Control	Male	Less experience	3.00	1.41	9
			More experience	4.00	1.73	9
			Total	3.50	1.62	18
		Female	Less experience	3.31	1.42	32
			More experience	3.04	1.57	24
			Total	3.20	1.48	56
		Total	Less experience	3.24	1.41	41
			More experience	3.30	1.65	33
			Total	3.27	1.51	74
	Insight	Male	Less experience	4.00	1.86	12
			More experience	2.29	1.05	17
			Total	3.00	1.65	29
		Female	Less experience	3.12	1.27	25
			More experience	3.14	1.21	22
			Total	3.13	1.23	47
		Total	Less experience	3.41	1.52	37
			More experience	2.77	1.20	39
			Total	3.08	1.39	76
	Accountability	Male	Less experience	3.71	1.49	14
			More experience	3.43	1.95	14
			Total	3.57	1.71	28
		Female	Less experience	3.18	1.47	22
			More experience	2.81	1.21	27
			Total	2.98	1.33	49
		Total	Less experience	3.39	1.48	36
			More experience	3.02	1.51	41
			Total	3.19	1.50	77
	Total	Male	Less experience	3.63	1.61	35
			More experience	3.08	1.69	40
			Total	3.33	1.66	75
		Female	Less experience	3.22	1.37	79
			More experience	2.99	1.33	73
			Total	3.11	1.35	152
		Total	Less experience	3.34	1.46	114
			More experience	3.02	1.46	113
			Total	3.18	1.46	227
General Accident Risk Estimates Time 2	Control	Male	Less experience	2.22	1.30	9
			More experience	3.00	1.50	9
			Total	2.61	1.42	18
		Female	Less experience	3.28	1.05	32
			More experience	3.04	1.52	24
			Total	3.18	1.27	56
		Total	Less experience	3.05	1.18	41
			More experience	3.03	1.49	33
			Total	3.04	1.32	74
	Hazard Perception	Male	Less experience	3.17	1.53	12
			More experience	2.88	1.76	17
			Total	3.00	1.65	29
		Female	Less experience	3.28	1.14	25
			More experience	3.14	1.28	22

		Total	3.21	1.20	47
	Total	Less experience	3.24	1.26	37
		More experience	3.03	1.50	39
		Total	3.13	1.38	76
Accountability	Male	Less experience	3.21	0.98	14
		More experience	2.50	0.86	14
		Total	2.86	0.97	28
	Female	Less experience	3.00	1.20	22
		More experience	2.52	0.89	27
		Total	2.73	1.06	49
	Total	Less experience	3.08	1.11	36
		More experience	2.51	0.87	41
		Total	2.78	1.02	77
Total	Male	Less experience	2.94	1.31	35
		More experience	2.77	1.42	40
		Total	2.85	1.36	75
	Female	Less experience	3.20	1.11	79
		More experience	2.88	1.26	73
		Total	3.05	1.19	152
	Total	Less experience	3.12	1.18	114
		More experience	2.84	1.31	113
		Total	2.98	1.25	227

APPENDIX K: DESCRIPTIVE STATISTICS FOR COMPARATIVE ESTIMATES OF PERCEIVED DRIVER SKILL IN SPECIFIC SITUATIONS – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
Specific Skill Estimates Time 1	Control	Male	Less experience	5.27	0.67	9
			More experience	5.13	0.77	9
			Total	5.20	0.70	18
		Female	Less experience	4.81	0.70	31
			More experience	5.06	0.87	24
			Total	4.92	0.78	55
		Total	Less experience	4.91	0.71	40
			More experience	5.08	0.83	33
			Total	4.99	0.77	73
	Insight	Male	Less experience	4.93	1.05	12
			More experience	5.17	0.80	17
			Total	5.07	0.90	29
		Female	Less experience	4.60	0.81	25
			More experience	4.93	0.74	22
			Total	4.75	0.79	47
		Total	Less experience	4.71	0.90	37
			More experience	5.03	0.77	39
			Total	4.87	0.84	76
	Accountability	Male	Less experience	4.72	0.85	13
			More experience	5.20	0.69	14
			Total	4.96	0.80	27
		Female	Less experience	4.75	0.87	22
			More experience	5.18	0.95	27
			Total	4.99	0.93	49
		Total	Less experience	4.74	0.85	35
			More experience	5.19	0.86	41
			Total	4.98	0.88	76
	Total	Male	Less experience	4.94	0.89	34
			More experience	5.17	0.74	40
			Total	5.06	0.81	74
		Female	Less experience	4.73	0.78	78
			More experience	5.07	0.86	73
			Total	4.89	0.84	151
		Total	Less experience	4.79	0.82	112
			More experience	5.10	0.82	113
			Total	4.95	0.83	225
Specific Skill Estimates Time 2	Control	Male	Less experience	4.75	0.59	9
			More experience	5.30	0.96	9
			Total	5.02	0.82	18
		Female	Less experience	4.76	0.90	31
			More experience	5.02	1.04	24
			Total	4.87	0.96	55
		Total	Less experience	4.76	0.83	40
			More experience	5.09	1.01	33
			Total	4.91	0.92	73
	Insight	Male	Less experience	4.76	1.01	12
			More experience	5.23	0.85	17
			Total	5.04	0.94	29
		Female	Less experience	4.38	0.56	25
			More experience	5.09	1.02	22

		Total	4.71	0.88	47
	Total	Less experience	4.50	0.75	37
		More experience	5.15	0.94	39
		Total	4.84	0.91	76
Accountability	Male	Less experience	4.48	0.89	13
		More experience	5.26	0.80	14
		Total	4.88	0.92	27
	Female	Less experience	4.76	0.92	22
		More experience	5.11	0.97	27
		Total	4.95	0.96	49
	Total	Less experience	4.66	0.91	35
		More experience	5.16	0.91	41
		Total	4.93	0.94	76
Total	Male	Less experience	4.65	0.86	34
		More experience	5.26	0.84	40
		Total	4.98	0.89	74
	Female	Less experience	4.64	0.82	78
		More experience	5.07	1.00	73
		Total	4.85	0.93	151
	Total	Less experience	4.64	0.83	112
		More experience	5.14	0.94	113
		Total	4.89	0.92	225

APPENDIX L: DESCRIPTIVE STATISTICS FOR COMPARATIVE ESTIMATES OF PERCEIVED DRIVER SAFETY IN SPECIFIC SITUATIONS – FINAL ANALYES

	Group	Gender	Experience	M	SD	N
Specific Safety Estimates Time 1	Control	Male	Less experience	5.35	1.02	9
			More experience	5.22	1.32	9
			Total	5.28	1.14	18
		Female	Less experience	5.63	0.80	31
			More experience	5.24	1.11	24
			Total	5.46	0.96	55
		Total	Less experience	5.56	0.85	40
			More experience	5.24	1.15	33
			Total	5.42	1.00	73
	Insight	Male	Less experience	4.89	0.89	12
			More experience	5.38	0.95	17
			Total	5.18	0.94	29
		Female	Less experience	5.44	0.98	25
			More experience	5.54	0.66	22
			Total	5.48	0.84	47
		Total	Less experience	5.26	0.97	37
			More experience	5.47	0.79	39
			Total	5.37	0.88	76
	Accountability	Male	Less experience	4.64	0.71	13
			More experience	5.27	0.66	14
			Total	4.97	0.74	27
		Female	Less experience	5.25	1.04	22
			More experience	5.56	0.76	26
			Total	5.42	0.90	48
		Total	Less experience	5.03	0.96	35
			More experience	5.46	0.73	40
			Total	5.26	0.87	75
	Total	Male	Less experience	4.92	0.88	34
			More experience	5.31	0.93	40
			Total	5.13	0.93	74
		Female	Less experience	5.46	0.93	78
			More experience	5.45	0.87	72
			Total	5.45	0.90	150
		Total	Less experience	5.29	0.94	112
			More experience	5.40	0.89	112
			Total	5.35	0.92	224
Specific Safety Estimates Time 2	Control	Male	Less experience	5.35	0.85	9
			More experience	5.40	0.93	9
			Total	5.38	0.87	18
		Female	Less experience	5.58	0.76	31
			More experience	5.44	1.11	24
			Total	5.52	0.92	55
		Total	Less experience	5.53	0.78	40
			More experience	5.43	1.05	33
			Total	5.48	0.91	73
	Insight	Male	Less experience	4.53	1.07	12
			More experience	5.52	0.74	17
			Total	5.11	1.00	29
		Female	Less experience	5.33	0.93	25
			More experience	5.22	0.83	22

		Total	5.28	0.88	47
	Total	Less experience	5.07	1.04	37
		More experience	5.35	0.80	39
		Total	5.22	0.93	76
Accountability	Male	Less experience	4.81	0.97	13
		More experience	5.01	0.76	14
		Total	4.91	0.85	27
	Female	Less experience	5.34	0.97	22
		More experience	5.71	0.86	26
		Total	5.54	0.92	48
	Total	Less experience	5.14	0.99	35
		More experience	5.46	0.88	40
		Total	5.31	0.94	75
Total	Male	Less experience	4.85	1.00	34
		More experience	5.32	0.81	40
		Total	5.10	0.92	74
	Female	Less experience	5.43	0.88	78
		More experience	5.47	0.95	72
		Total	5.45	0.91	150
	Total	Less experience	5.26	0.95	112
		More experience	5.41	0.90	112
		Total	5.34	0.93	224

APPENDIX M: DESCRIPTIVE STATISTICS FOR COMPARATIVE ESTIMATES OF PERCEIVED DRIVER ACCIDENT RISK IN SPECIFIC SITUATIONS – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
Specific Accident Risk Estimates Time 1	Control	Male	Less experience	3.02	0.85	9
			More experience	3.02	1.02	9
			Total	3.02	0.91	18
		Female	Less experience	3.25	0.72	31
			More experience	3.48	0.90	24
			Total	3.35	0.80	55
		Total	Less experience	3.20	0.75	40
			More experience	3.36	0.94	33
			Total	3.27	0.84	73
	Insight	Male	Less experience	3.10	1.30	12
			More experience	2.90	0.93	17
			Total	2.98	1.08	29
		Female	Less experience	3.56	0.96	25
			More experience	3.56	0.82	22
			Total	3.56	0.89	47
		Total	Less experience	3.41	1.09	37
			More experience	3.27	0.92	39
			Total	3.34	1.00	76
	Accountability	Male	Less experience	3.61	0.90	13
			More experience	2.93	0.80	14
			Total	3.26	0.90	27
		Female	Less experience	3.77	0.85	22
			More experience	3.18	0.85	26
			Total	3.45	0.89	48
		Total	Less experience	3.71	0.86	35
			More experience	3.09	0.83	40
			Total	3.38	0.89	75
	Total	Male	Less experience	3.27	1.05	34
			More experience	2.94	0.88	40
			Total	3.09	0.97	74
		Female	Less experience	3.50	0.86	78
			More experience	3.40	0.86	72
			Total	3.45	0.86	150
		Total	Less experience	3.43	0.92	112
			More experience	3.23	0.89	112
			Total	3.33	0.91	224
Specific Accident Risk Estimates Time 2	Control	Male	Less experience	3.32	0.96	9
			More experience	3.14	1.05	9
			Total	3.23	0.98	18
		Female	Less experience	3.37	0.83	31
			More experience	3.29	1.01	24
			Total	3.34	0.90	55
		Total	Less experience	3.36	0.84	40
			More experience	3.25	1.01	33
			Total	3.31	0.92	73
	Insight	Male	Less experience	3.36	0.99	12
			More experience	2.81	0.83	17
			Total	3.04	0.92	29
		Female	Less experience	3.69	0.84	25

		More experience	3.39	0.65	22
		Total	3.55	0.77	47
	Total	Less experience	3.59	0.89	37
		More experience	3.13	0.78	39
		Total	3.35	0.86	76
Accountability	Male	Less experience	3.53	0.93	13
		More experience	2.93	0.72	14
		Total	3.22	0.87	27
	Female	Less experience	3.42	0.80	22
		More experience	3.02	0.83	26
		Total	3.21	0.83	48
	Total	Less experience	3.47	0.83	35
		More experience	2.99	0.78	40
		Total	3.21	0.84	75
Total	Male	Less experience	3.42	0.93	34
		More experience	2.92	0.83	40
		Total	3.15	0.91	74
	Female	Less experience	3.49	0.82	78
		More experience	3.22	0.85	72
		Total	3.36	0.84	150
	Total	Less experience	3.47	0.85	112
		More experience	3.12	0.85	112
		Total	3.29	0.87	224

APPENDIX N: DESCRIPTIVE STATISTICS FOR COMPARATIVE ESTIMATES OF PERCEIVED DRIVER HAZARD PERCEPTION SKILLS – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
Hazard Perception Skill Estimates Time 1	Control	Male	Less experience	4.63	0.94	9
			More experience	5.52	0.92	9
			Total	5.07	1.01	18
		Female	Less experience	4.61	0.82	31
			More experience	4.75	1.14	24
			Total	4.67	0.97	55
		Total	Less experience	4.62	0.84	40
			More experience	4.96	1.13	33
			Total	4.77	0.99	73
	Insight	Male	Less experience	4.85	1.34	12
			More experience	5.13	0.82	17
			Total	5.01	1.05	29
		Female	Less experience	4.19	0.77	25
			More experience	4.54	0.94	22
			Total	4.35	0.86	47
		Total	Less experience	4.40	1.02	37
			More experience	4.79	0.92	39
			Total	4.60	0.99	76
	Accountability	Male	Less experience	4.82	1.24	13
			More experience	4.76	0.81	14
			Total	4.79	1.02	27
		Female	Less experience	4.58	0.99	22
			More experience	4.92	1.11	27
			Total	4.77	1.06	49
		Total	Less experience	4.67	1.08	35
			More experience	4.87	1.01	41
			Total	4.78	1.04	76
	Total	Male	Less experience	4.78	1.18	34
			More experience	5.09	0.87	40
			Total	4.95	1.02	74
		Female	Less experience	4.47	0.87	78
			More experience	4.75	1.07	73
			Total	4.60	0.98	151
		Total	Less experience	4.56	0.98	112
			More experience	4.87	1.01	113
			Total	4.72	1.01	225
Hazard Perception Skill Estimates Time 2	Control	Male	Less experience	4.54	0.67	9
			More experience	5.52	1.05	9
			Total	5.03	0.99	18
		Female	Less experience	4.53	1.04	31
			More experience	4.75	1.45	24
			Total	4.62	1.23	55
		Total	Less experience	4.53	0.96	40
			More experience	4.96	1.38	33
			Total	4.72	1.18	73
	Insight	Male	Less experience	4.82	1.23	12
			More experience	5.17	0.83	17
			Total	5.02	1.01	29
		Female	Less experience	4.33	0.71	25
			More experience	4.89	1.14	22

		Total	4.59	0.97	47
	Total	Less experience	4.49	0.92	37
		More experience	5.01	1.01	39
		Total	4.75	1.00	76
Accountability	Male	Less experience	4.88	1.37	13
		More experience	5.31	1.02	14
		Total	5.10	1.19	27
	Female	Less experience	4.69	1.16	22
		More experience	5.19	1.06	27
		Total	4.97	1.12	49
	Total	Less experience	4.76	1.23	35
		More experience	5.23	1.03	41
		Total	5.02	1.14	76
Total	Male	Less experience	4.77	1.15	34
		More experience	5.30	0.93	40
		Total	5.05	1.06	74
	Female	Less experience	4.51	0.99	78
		More experience	4.95	1.22	73
		Total	4.72	1.12	151
	Total	Less experience	4.59	1.04	112
		More experience	5.08	1.14	113
		Total	4.83	1.11	225

APPENDIX O: DESCRIPTIVE STATISTICS FOR ATTITUDES TOWARD FUN-RIDING – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
Attitudes to Fun-Riding (Revised) Time 1	Control	Male	Less experience	1.83	0.56	9
			More experience	1.94	0.92	9
			Total	1.89	0.74	18
		Female	Less experience	1.55	0.81	31
			More experience	1.46	0.44	24
			Total	1.51	0.67	55
		Total	Less experience	1.61	0.76	40
			More experience	1.59	0.63	33
			Total	1.60	0.70	73
	Insight	Male	Less experience	2.08	0.79	12
			More experience	1.76	0.64	17
			Total	1.90	0.71	29
		Female	Less experience	1.44	0.62	25
			More experience	1.73	0.77	22
			Total	1.57	0.70	47
		Total	Less experience	1.65	0.73	37
			More experience	1.74	0.71	39
			Total	1.70	0.72	76
	Accountability	Male	Less experience	2.27	0.86	13
			More experience	2.00	0.71	14
			Total	2.13	0.78	27
		Female	Less experience	2.02	1.16	22
			More experience	1.33	0.44	27
			Total	1.64	0.90	49
		Total	Less experience	2.11	1.05	35
			More experience	1.56	0.62	41
			Total	1.82	0.89	76
	Total	Male	Less experience	2.09	0.76	34
			More experience	1.89	0.72	40
			Total	1.98	0.74	74
		Female	Less experience	1.65	0.89	78
			More experience	1.49	0.57	73
			Total	1.57	0.76	151
		Total	Less experience	1.78	0.88	112
			More experience	1.63	0.65	113
			Total	1.71	0.78	225
Attitudes to Fun-Riding (Revised) Time 2	Control	Male	Less experience	1.94	0.77	9
			More experience	1.78	0.97	9
			Total	1.86	0.85	18
		Female	Less experience	1.71	0.81	31
			More experience	1.33	0.58	24
			Total	1.55	0.74	55
		Total	Less experience	1.76	0.80	40
			More experience	1.45	0.72	33
			Total	1.62	0.78	73
	Insight	Male	Less experience	2.13	0.91	12
			More experience	1.88	0.88	17
			Total	1.98	0.88	29
		Female	Less experience	1.88	0.92	25
			More experience	1.64	0.77	22
			Total	1.77	0.85	47
		Total	Less experience	1.96	0.91	37
			More experience	1.74	0.82	39

			Total	1.85	0.86	76
	Accountability	Male	Less experience	2.04	0.92	13
			More experience	2.04	0.95	14
			Total	2.04	0.92	27
		Female	Less experience	2.09	1.15	22
			More experience	1.43	0.49	27
			Total	1.72	0.91	49
		Total	Less experience	2.07	1.06	35
			More experience	1.63	0.73	41
			Total	1.84	0.92	76
	Total	Male	Less experience	2.04	0.86	34
			More experience	1.91	0.91	40
			Total	1.97	0.88	74
		Female	Less experience	1.87	0.95	78
			More experience	1.46	0.62	73
			Total	1.67	0.83	151
		Total	Less experience	1.92	0.92	112
			More experience	1.62	0.76	113
			Total	1.77	0.86	225

APPENDIX P: DESCRIPTIVE STATISTICS FOR ATTITUDES TOWARD TRAFFIC FLOW VS RULE OBEDIENCE – FINAL ANALYES

	Group	Gender	Experience	M	SD	N
Attitudes to Traffic Flow Vs Rule Obedience Time 1	Control	Male	Less experience	2.30	0.70	9
			More experience	2.86	0.61	9
			Total	2.58	0.70	18
		Female	Less experience	2.31	0.65	31
			More experience	2.37	0.58	24
			Total	2.34	0.61	55
		Total	Less experience	2.31	0.65	40
			More experience	2.51	0.62	33
			Total	2.40	0.64	73
	Insight	Male	Less experience	2.92	0.59	12
			More experience	2.73	0.79	17
			Total	2.80	0.71	29
		Female	Less experience	2.20	0.78	25
			More experience	2.42	0.71	22
			Total	2.30	0.75	47
		Total	Less experience	2.43	0.80	37
			More experience	2.55	0.75	39
			Total	2.49	0.77	76
	Accountability	Male	Less experience	2.80	0.62	13
			More experience	2.89	0.54	14
			Total	2.85	0.57	27
		Female	Less experience	2.53	0.65	22
			More experience	2.32	0.56	27
			Total	2.41	0.61	49
		Total	Less experience	2.63	0.65	35
			More experience	2.51	0.61	41
			Total	2.57	0.63	76
	Total	Male	Less experience	2.71	0.67	34
			More experience	2.81	0.66	40
			Total	2.77	0.66	74
		Female	Less experience	2.34	0.70	78
			More experience	2.37	0.61	73
			Total	2.35	0.65	151
		Total	Less experience	2.45	0.71	112
			More experience	2.52	0.66	113
			Total	2.49	0.68	225
Attitudes to Traffic Flow Vs Rule Obedience Time 2	Control	Male	Less experience	2.35	0.71	9
			More experience	2.56	0.57	9
			Total	2.45	0.63	18
		Female	Less experience	2.37	0.71	31
			More experience	2.32	0.64	24
			Total	2.35	0.67	55
		Total	Less experience	2.36	0.70	40
			More experience	2.38	0.62	33
			Total	2.37	0.66	73
	Insight	Male	Less experience	2.93	0.62	12
			More experience	2.77	0.89	17
			Total	2.84	0.78	29
		Female	Less experience	2.31	0.78	25
			More experience	2.49	0.76	22

		Total	2.39	0.77	47
	Total	Less experience	2.51	0.78	37
		More experience	2.61	0.82	39
		Total	2.56	0.80	76
Accountability	Male	Less experience	2.79	0.57	13
		More experience	2.84	0.89	14
		Total	2.81	0.74	27
	Female	Less experience	2.61	0.70	22
		More experience	2.43	0.59	27
		Total	2.51	0.64	49
	Total	Less experience	2.68	0.66	35
		More experience	2.57	0.72	41
		Total	2.62	0.69	76
Total	Male	Less experience	2.72	0.65	34
		More experience	2.75	0.82	40
		Total	2.73	0.74	74
	Female	Less experience	2.42	0.73	78
		More experience	2.41	0.65	73
		Total	2.42	0.69	151
	Total	Less experience	2.51	0.72	112
		More experience	2.53	0.73	113
		Total	2.52	0.72	225

APPENDIX Q: DESCRIPTIVE STATISTICS FOR ATTITUDES TOWARD SPEEDING – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
Attitudes to Speed Time 1	Control	Male	Less experience	1.71	0.45	9
			More experience	2.36	0.95	9
			Total	2.03	0.79	18
		Female	Less experience	1.96	0.83	31
			More experience	2.01	0.71	24
			Total	1.98	0.77	55
		Total	Less experience	1.91	0.76	40
			More experience	2.10	0.78	33
			Total	1.99	0.77	73
	Insight	Male	Less experience	2.60	1.20	12
			More experience	2.47	0.89	17
			Total	2.52	1.01	29
		Female	Less experience	1.78	0.80	25
			More experience	1.90	0.69	22
			Total	1.84	0.75	47
		Total	Less experience	2.05	1.01	37
			More experience	2.15	0.82	39
			Total	2.10	0.91	76
	Accountability	Male	Less experience	2.26	0.85	13
			More experience	2.50	0.91	14
			Total	2.39	0.87	27
		Female	Less experience	2.19	0.88	22
			More experience	1.92	0.71	27
			Total	2.04	0.79	49
		Total	Less experience	2.22	0.85	35
			More experience	2.12	0.82	41
			Total	2.16	0.83	76
	Total	Male	Less experience	2.24	0.95	34
			More experience	2.46	0.89	40
			Total	2.35	0.92	74
		Female	Less experience	1.97	0.84	78
			More experience	1.94	0.69	73
			Total	1.96	0.77	151
		Total	Less experience	2.05	0.88	112
			More experience	2.12	0.80	113
			Total	2.09	0.84	225
Attitudes to Speed Time 2	Control	Male	Less experience	2.00	0.63	9
			More experience	1.96	0.74	9
			Total	1.98	0.67	18
		Female	Less experience	1.95	0.78	31
			More experience	1.88	0.67	24
			Total	1.91	0.73	55
		Total	Less experience	1.96	0.74	40
			More experience	1.90	0.68	33
			Total	1.93	0.71	73
	Insight	Male	Less experience	2.67	1.04	12
			More experience	2.59	0.98	17
			Total	2.62	0.99	29
		Female	Less experience	1.99	0.82	25
			More experience	2.15	0.87	22
			Total	2.06	0.84	47
		Total	Less experience	2.21	0.94	37

			More experience	2.34	0.93	39
			Total	2.27	0.93	76
	Accountability	Male	Less experience	2.22	0.70	13
			More experience	2.53	1.04	14
			Total	2.38	0.89	27
		Female	Less experience	2.22	0.93	22
			More experience	2.15	0.89	27
			Total	2.18	0.90	49
		Total	Less experience	2.22	0.84	35
			More experience	2.28	0.95	41
			Total	2.25	0.90	76
	Total	Male	Less experience	2.32	0.84	34
			More experience	2.43	0.97	40
			Total	2.38	0.91	74
		Female	Less experience	2.04	0.84	78
			More experience	2.06	0.82	73
			Total	2.05	0.82	151
		Total	Less experience	2.12	0.85	112
			More experience	2.19	0.89	113
			Total	2.15	0.86	225

APPENDIX R – DESCRIPTIVE STATISTICS FOR ATTITUDES TOWARD INJURY REFLECTION – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
Attitudes to Injury Reflection Time 1	Control	Male	Less experience	3.37	0.51	9
			More experience	3.74	0.68	9
			Total	3.56	0.62	18
		Female	Less experience	3.61	0.95	31
			More experience	3.68	0.90	24
			Total	3.64	0.92	55
		Total	Less experience	3.56	0.87	40
			More experience	3.70	0.84	33
			Total	3.62	0.85	73
	Insight	Male	Less experience	3.19	0.82	12
			More experience	3.51	0.82	17
			Total	3.38	0.82	29
		Female	Less experience	3.91	0.54	25
			More experience	3.52	0.66	22
			Total	3.72	0.62	47
		Total	Less experience	3.68	0.72	37
			More experience	3.51	0.72	39
			Total	3.59	0.72	76
	Accountability	Male	Less experience	3.59	0.83	13
			More experience	3.04	1.03	14
			Total	3.30	0.96	27
		Female	Less experience	3.85	0.84	22
			More experience	3.46	1.00	27
			Total	3.63	0.95	49
		Total	Less experience	3.75	0.83	35
			More experience	3.31	1.02	41
			Total	3.52	0.96	76
	Total	Male	Less experience	3.39	0.75	34
			More experience	3.40	0.90	40
			Total	3.39	0.83	74
		Female	Less experience	3.77	0.81	78
			More experience	3.55	0.87	73
			Total	3.66	0.84	151
		Total	Less experience	3.66	0.81	112
			More experience	3.49	0.88	113
			Total	3.58	0.85	225
Attitudes to Injury Reflection Time 2	Control	Male	Less experience	3.52	0.73	9
			More experience	3.19	0.80	9
			Total	3.35	0.76	18
		Female	Less experience	3.69	0.75	31
			More experience	3.86	0.80	24
			Total	3.76	0.77	55
		Total	Less experience	3.65	0.74	40
			More experience	3.68	0.85	33
			Total	3.66	0.78	73
	Insight	Male	Less experience	3.11	0.64	12
			More experience	3.45	0.84	17
			Total	3.31	0.77	29
		Female	Less experience	3.88	0.64	25
			More experience	3.52	0.86	22
			Total	3.71	0.77	47
		Total	Less experience	3.63	0.73	37

		More experience	3.49	0.84	39
		Total	3.56	0.79	76
Accountability	Male	Less experience	3.44	1.01	13
		More experience	2.98	0.91	14
		Total	3.20	0.97	27
	Female	Less experience	4.00	0.80	22
		More experience	3.46	0.98	27
		Total	3.70	0.94	49
	Total	Less experience	3.79	0.91	35
		More experience	3.29	0.97	41
		Total	3.52	0.97	76
Total	Male	Less experience	3.34	0.82	34
		More experience	3.23	0.86	40
		Total	3.28	0.84	74
	Female	Less experience	3.84	0.74	78
		More experience	3.61	0.89	73
		Total	3.73	0.82	151
	Total	Less experience	3.69	0.79	112
		More experience	3.47	0.90	113
		Total	3.58	0.85	225

APPENDIX S: DESCRIPTIVE STATISTICS FOR ATTITUDES TOWARD CONCERN FOR OTHERS – FINAL ANALYSES

	Group	Gender	Experience	M	SD	N
Attitudes to Concern (Revised) Time 1	Control	Male	Less experience	4.11	0.55	9
			More experience	4.25	0.52	9
			Total	4.18	0.52	18
		Female	Less experience	4.66	0.47	31
			More experience	4.42	0.75	24
			Total	4.55	0.62	55
		Total	Less experience	4.54	0.54	40
			More experience	4.37	0.69	33
			Total	4.46	0.61	73
	Insight	Male	Less experience	3.50	0.92	12
			More experience	3.94	0.61	17
			Total	3.76	0.77	29
		Female	Less experience	4.63	0.43	25
			More experience	4.42	0.53	22
			Total	4.53	0.49	47
		Total	Less experience	4.26	0.82	37
			More experience	4.21	0.61	39
			Total	4.24	0.71	76
	Accountability	Male	Less experience	4.08	0.41	13
			More experience	4.11	0.68	14
			Total	4.09	0.56	27
		Female	Less experience	4.65	0.34	22
			More experience	4.37	0.67	27
			Total	4.49	0.56	49
		Total	Less experience	4.44	0.46	35
			More experience	4.28	0.68	41
			Total	4.35	0.59	76
	Total	Male	Less experience	3.88	0.71	34
			More experience	4.07	0.61	40
			Total	3.98	0.66	74
		Female	Less experience	4.65	0.42	78
			More experience	4.40	0.65	73
			Total	4.53	0.56	151
		Total	Less experience	4.42	0.63	112
			More experience	4.28	0.66	113
			Total	4.35	0.65	225
Attitudes to Concern (Revised) Time 2	Control	Male	Less experience	4.17	0.63	9
			More experience	4.28	0.38	9
			Total	4.22	0.51	18
		Female	Less experience	4.56	0.53	31
			More experience	4.67	0.49	24
			Total	4.60	0.51	55
		Total	Less experience	4.47	0.57	40
			More experience	4.56	0.49	33
			Total	4.51	0.53	73
	Insight	Male	Less experience	3.75	0.24	12
			More experience	4.10	0.73	17
			Total	3.96	0.60	29
		Female	Less experience	4.47	0.58	25
			More experience	4.36	0.88	22
			Total	4.42	0.73	47
		Total	Less experience	4.24	0.60	37
			More experience	4.25	0.82	39

		Total	4.24	0.71	76
Accountability	Male	Less experience	4.06	0.60	13
		More experience	4.11	0.71	14
		Total	4.08	0.65	27
	Female	Less experience	4.42	0.72	22
		More experience	4.44	0.57	27
		Total	4.43	0.63	49
	Total	Less experience	4.29	0.69	35
		More experience	4.33	0.63	41
		Total	4.31	0.66	76
Total	Male	Less experience	3.98	0.52	34
		More experience	4.14	0.65	40
		Total	4.07	0.60	74
	Female	Less experience	4.49	0.60	78
		More experience	4.49	0.66	73
		Total	4.49	0.63	151
	Total	Less experience	4.33	0.62	112
		More experience	4.37	0.67	113
		Total	4.35	0.65	225