RISK PERCEPTIONS, ATTITUDES, AND BEHAVIOURS REGARDING DRIVER FATIGUE IN NSW YOUTH: THE DEVELOPMENT OF AN EVIDENCE-BASED DRIVER FATIGUE EDUCATIONAL INTERVENTION STRATEGY

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Acknowledgement: The authors gratefully acknowledge the Motor Accidents Authority for funding this research project. Dr Hatfield was supported by an NHMRC Population Health Capacity Building Grant in Injury Prevention, Acute Care and Rehabilitation.

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Executive summary

Background

Driver fatigue is a major contributor to road trauma, and young drivers are over-represented in fatigue-related crashes. Whilst most young people are aware of the signs of fatigue, 1 in 2 young motorists is still likely to continue driving whilst fatigued (RTA, 2001), suggesting the importance of considering motivational factors in campaigns designed to curb driver fatigue.

Because the benefits of driving whilst fatigued are often real, and because there exists neither effective legislation nor enforcement regarding this issue for most drivers, campaigns might best focus on the perceived risks of crashing, and of social censure, associated with driving whilst fatigued. Young drivers' understanding of the crash risks associated with driving whilst fatigued may be inaccurate because of 1) comparisons with more risky behaviours such as speeding and drink-driving; 2) a tendency to underestimate personal risk of harm (illusory invulnerability, or "optimism bias"); and 3) overestimation of the efficacy of behaviours and situations supposed to immunise against the crash risk of driving whilst fatigued (e.g. drinking caffeine, only driving short distances). Manipulating social censure has been effective in campaigns to reduce drink-driving, but little is known about social norms regarding driver fatigue.

Public education campaigns that have been used to target driver fatigue in NSW have presented risk information in a form that may have produced denial, and propagated myths regarding driver fatigue. Some have failed to provide a clear message regarding appropriate behaviour. The limited efficacy of the previous campaigns against driver fatigue is suggested by the trends in proportion of fatigue-related crashes observed over the history of the campaigns.

Motivational factors may differ between young and older drivers, and this may contribute to the over-involvement of younger drivers in fatigue-related crashes. Interventions should be specifically targeted at young people to counter driving whilst fatigued.

Aims

The present research program aimed to:

1) Collect information from young drivers regarding their beliefs, attitudes, and behaviours in relation to driving whilst fatigued (Study 1);
2) Design anti-fatigue messages specifically targeting young drivers based on findings of Study 1, as well as relevant theory and evidence;
3) Evaluate these anti-fatigue messages in terms of beliefs, attitudes, and intended behaviour (Study 2).

Study 1

A structured telephone survey assessing risk perceptions, attitudes, and behavioural practises in relation to road safety in general, and to driver fatigue specifically, socio-demographic variables, and aspects of driving experience was conducted with 259

randomly selected NSW drivers (46% male) aged between 17 and 25, and residing in the Sydney metropolitan (65%) or rural areas.

Key findings were:

- Perceived risk of penalty is unlikely to be a strong deterrent to driving whilst fatigued amongst young people.
- Fatigue is recognised as a contributor to crash risk, though (probably appropriately) not as frequent a contributor as speeding or drink-driving. There may be room for improvement in the extent to which fatigue is perceived to increase crash risk.
- Typical self-enhancing bias was observed for situations not involving fatigue, but for the same situations involving fatigue self-deprecating bias was observed. This pattern may reflect a tendency to view oneself as "more extreme than average", but may also reflect a response bias. If the results are genuine, they indicate that the risks posed by driving whilst fatigued are personalised.
- Use of inappropriate techniques to continue driving whilst fatigued is extensive, although only four inappropriate techniques are believed to effectively reduce fatigue-related crash risk: chatting with passengers, using caffeine, winding the window down to feel a breeze, and turning up the music or singing.
- The appropriate technique of resting is more commonly regarded as effective, but no more commonly performed, than inappropriate techniques.
- Several techniques for avoiding driving whilst fatigued in the first place have been employed by at least 30% of respondents- albeit a lower proportion than have employed many of the inappropriate counter-fatigue techniques.
- A large percentage of respondents recognise that fatigue can affect anyone.
- The belief that fatigue mainly affects people driving long distances was endorsed by just over 10% of the sample.
- Driver fatigue is thought most likely to be a problem on longer drives, and we observed a self-enhancing bias regarding the ability to drive without becoming fatigued.
- There is some social censure of driving whilst fatigued (with a modal description of a young fatigued driver as "irresponsible" and support for various penalties for driving whilst fatigued), but it could be strengthened.
- Experience of various symptoms of driver fatigue is high. The pattern of results suggests that less frequent reporting of a symptom may reflect less frequent recognition of that symptom rather than less frequent experience of it.
- 80% of respondents report driving whilst fatigued at least sometimes, and over 25% report driving whilst fatigued at least once per week.
- Only 5% of respondents report having had a fatigue-related crash, although 29% report nearly crashing as a result of fatigue.
- Relationships with self-reported driving whilst fatigued, and experience of fatigue-related incidents suggest the importance of targeting perceived fatigue-related crash risks, the use and perceived efficacy of inappropriate techniques to combat fatigue, as well as social norms, in anti-fatigue messages.
- Whilst there is some recognition of factors besides driving contributing to driver fatigue, socialising, partying and studying were recognised by less than 15% of respondents.
- Counter-fatigue messages were most commonly seen on TV.

Implications of findings for anti-fatigue messages to be evaluated in Study 2

Because there are currently no penalties or detection methods, and because we wanted to base our anti-fatigue messages on factual information, penalties and detection were not a component of the anti-fatigue messages developed for the present research.

We developed four different anti-fatigue messages (with some common content).

In order to extend recognition of crash risks associated with fatigue, all anti-fatigue messages identify that "fatigue impairs driving skills and ability, so increasing the chances of a crash" and provide statistics regarding the likelihood of a young driver being the driver in a fatigue-related crash, with a graphical representation of these statistics (see Figure 15). Two versions of the message also included a "Risk ladder" to aid interpretation of risk information.

The information presented aimed to personalise risks. The pamphlet, "Driver fatigue and you" was largely phrased in the second person. Statistics were given for young drivers, and the "Risk ladder" explicitly identified their consequent relevance. The failure of driving skill to immunise against fatigue-related crash risk was emphasised in all anti-fatigue messages, and reiterated in the "Debunking common myths" section that was included in two versions of the message.

Further, anti-fatigue messages aimed to:

- emphasise that crash risks could not be reduced through using various inappropriate counter-fatigue techniques, and offered advice regarding appropriate means of minimising fatigue-related crash risk.
- undermine perceived immunity from crash risk by identifying that "driver fatigue can affect anyone, regardless of age driving skill, or experience" and emphasising that "driver fatigue is not only a problem that happens on long drives".
- improve understanding of factors that contribute to driver fatigue, such as partying, lack of sleep, work and strenuous activity.

Social censure of driving whilst fatigued was not directly addressed in the anti-fatigue messages, but might be influenced by manipulation of perceived crash risk.

Based on Study 1 results anti-fatigue messages were designed to target 20 – 22 year olds, and males, but it did not appear necessary to modify these for use with females, and other age groups.

The validity of Study 1 findings is unlikely to have been undermined by the use of self-report, and so these findings offer a sound basis for the anti-fatigue messages.

Study 2

230 randomly selected participants (average age of 21 years, 51.7% female, and 43% rural) were recruited outside each of 7 RTA motor registries, and randomly assigned to one of 5 groups by consecutive allocation of different materials.

Some participants (Group E, the control group) received no “anti-fatigued-driving” message before completing questionnaires. All other participants received “Basic information” designed to mimic the information available in the better approaches to reducing fatigued driving, but to make this information more specific to young drivers. About one quarter of “message” participants (Group A) received no further information. Group B were given a “Risk ladder” designed to aid interpretation of the risk information. Group C were given material to dispute common myths about avoiding driver fatigue. Group D were given all materials.

Impacts of the messages were assessed using a questionnaire that was modified slightly from the questionnaire employed in Study 1 (e.g. assessment of intended rather than current behaviour).

For each outcome (belief, attitude or intended behaviour) variable, the control group was compared to each of the “message” groups separately.

The anti-fatigue messages produced desirable changes for 8 outcomes (relative to “no message” controls):

- increased perceived chance of having a crash when fatigued in Groups A and B (with tendency in Groups C and D)
- reduced optimism bias regarding crashing when *not* fatigued in Group B (with tendency in Groups C and D)
- reduced intended frequency of “turning the music up or singing” to combat fatigue in Groups C and D (with tendency in Groups A and B)
- reduced intended frequency of “taking drugs to keep awake or alert” in Group D (with tendency in Groups A, B, and C)
- reduced estimated number of minutes driving before becoming fatigued in Groups A and B (with tendency in Groups C and D, and in Group D p=.072)
- reduced self-enhancing bias regarding number of minutes driving before becoming fatigued in Group B (with opposite tendency in other groups)
- increased perceived chance of becoming fatigued on long drives in Group D (with tendency in Groups A, B, and C)
- reduced intended frequency of continuing to drive despite fatigue in Group C (with tendency in Groups A, B, and D)

In addition, P-values were low for

- increased intended frequency of “stop on the side of the road and have a rest” to combat fatigue in Group C (p=.083)
- reduced intended frequency of “chewing gum or eating” to combat fatigue in Group D (p=.096)

These effects would have been significant had a one-tailed test been employed, and may have reached significance in a larger sample.

For 8 outcomes, all four “message” groups were *non-significantly* different from the control group in a direction of desirable change:

- increased perceived chance of being pulled over by police for negligent driving due to fatigue
- increased perceived impact of fatigue on driving safety
- reduced optimism bias regarding crashing when fatigued
- reduced optimism bias regarding crashing when speeding

- reduced self-enhancing bias regarding driving safety when fatigued
- increased perceived impact of fatigue on self-enhancing bias regarding driving safety
- reduced intended frequency of “chewing gum or eating” to combat fatigue
- increased perceived chance of becoming fatigued on short drives

Only 2 significant undesirable changes were observed

- increased intended frequency of “trying to keep eyes wide open” to combat fatigue only in Group A
- increased self-enhancing bias regarding chance of becoming fatigued on long drives only in Group A (but tendency in other groups also)

In addition, all four “message” groups were *non-significantly* different from the control group in a direction of desirable change for 6 further variables.

Several findings of the present research allay concerns that the apparent improvement in beliefs, attitudes and intended behaviours may reflect a demand characteristic.

Participants reported finding the messages readable, interesting and personally relevant. Further, increasing the length and complexity of the messages did not appear to reduce their appeal.

Overall, the anti-fatigue message appears to have promise as a means of reducing the rate of driving whilst fatigued amongst young drivers. Because of the undesirable changes observed in Group A, it would appear advisable to add the “Risk ladder” and/or the “Debunking common myths” information. Whilst Group C performed best in terms of intentions to drive whilst fatigued, Group D performed best in terms of intention to perform inappropriate counter-fatigue techniques. Thus, Group D messages appear the best to adopt, although they might be refined and revaluated to investigate why they appear inferior to Group B messages in terms of perception of fatigue-related crash risk.

Background

The "driving[1] whilst fatigued" problem

Driver fatigue is well recognised as a problem in Australian road safety (RTA, 2001; Job & Dalziel, 2001) and is a major contributor to state road tolls (Lal and Craig, 2001). In 2003[2], of the 539 people killed on NSW roads 14% died as a result of a crash in which fatigue was identified as a contributing factor[3]. Further, in 2003, fatigue was identified as a contributing factor for 14% of fatal crashes, and 7% of injury crashes (RTA, 2004a). Fatigue is more likely to be identified as a causal factor in crashes where more than one person is killed (than in crashes where only one person is killed; RTA 2001). In the Community Attitude Survey conducted throughout Australia in March 2003 (Pennay, 2004), 15% of respondents reported having fallen asleep at the wheel at least once.

Young drivers are over-represented in all NSW road accidents and this applies to fatigue-related crashes also. In 2003, young drivers aged between 17 and 25 were involved in 25% of fatal crashes, despite comprising only 15% of license holders. A young person was the fatigued driver in 29% of all fatal crashes in which driver fatigue was identified as a contributing factor (RTA, 2004a). Moreover, the chances of a young person being behind the wheel in a fatal crash due to fatigue are 32% greater than those for drivers aged 30 to 39 years (the next most involved group) (RTA, 2004a). The statistics are similar for injury crashes involving driver fatigue, with young persons at 48% greater risk than controllers aged 30 to 39 years.

What motivates "driving whilst fatigued"?

Research suggests the need to consider motivational factors in efforts to curb peoples' preparedness to drive whilst fatigued. A survey of 1075 NSW drivers aged 17-70 reported by the RTA (2001) indicated that although most motorists in NSW were aware of the signs of fatigue and the strategies available to avoid fatigue, 1 in 2 drivers said that they would be likely to carry on driving whilst they were fatigued under certain circumstances. Thus, interventions that aim only to "educate" are likely to be of limited efficacy.

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[1] Throughout this report "driving" is used synonymously with "controlling a motor vehicle", and so refers also to the operation of motorcycles. Related terms such as "driver" are used in a parallel fashion.

[2] Data collection for this research project *began* around the time of a major fatigue campaign (the "circadian rhythms campaign" of April, 2003). Thus, the road crash statistics for 2003 are likely to be a better reflection of the beliefs and attitudes measured in this research project than are the statistics for 2002. In 2002, of the 570 people killed on NSW roads 20% died as a result of a crash in which fatigue was identified as a contributing factor (RTA, 2004b; RTA 2005b).

[3] The Roads and Traffic Authority of NSW acknowledge that the involvement of "fatigue as a contributing factor in road crashes cannot always be determined directly from police reports" (RTA, 2004a, p. xiv). Thus, fatigue is identified as a contributing factor in any crash involving at least one fatigued motor vehicle controller, where a motor vehicle controller is assessed as having been fatigued if a) they were described by police as being asleep, drowsy, or fatigued; and/or b) the vehicle performed a manoeuvre that suggested loss of concentration (i.e. travelled to the incorrect side of the road when no overtaking, or ran off the road when not travelling at excessive speed, and no other relevant factor was identified) (RTA, 2004a).

The perceived benefits and costs of driving whilst fatigued are likely to be particularly important motivational factors (see for example the Health Belief Model, Janz & Becker, 1994), and offer two possible avenues to pursue in designing relevant interventions. However, the potential benefits of driving whilst fatigued are real (e.g. the convenience of getting to a destination without taking the time to rest), and so may be difficult to undermine. Nonetheless, the potential costs (e.g. having a fatigue-related crash) are also real, and so interventions that highlight these costs, *and make them personally relevant*, may be effective.

Particularly prominent amongst perceived costs involved in health-relevant behaviour are perceived risks of performing the health-damaging behaviour (or not performing the health-enhancing behaviour, such as tooth brushing) in terms of potential negative outcomes. In relation to driving, potential negative outcomes are typically receiving a penalty, crashing and being injured or killed, and being censured by others (including family and friends).

Perceived risk of penalty

Currently, there is neither legislation nor enforcement for driving whilst fatigued for most drivers[4] (RTA, 2001), largely due to the lack of an accepted objective measure of fatigue, and the related lack of a dose-response curve on which to base regulation. Thus, perceived risk of penalty cannot yet be employed as a deterrent to driving whilst fatigued for most drivers (RTA, 2001).

Nonetheless, people may believe that there *are* penalties for driving whilst fatigued and the present research will survey young drivers regarding their beliefs about penalties for driving whilst fatigued, and examine the relationship between such beliefs and self-reported driving whilst fatigued.

Perceived risk of crashing & being injured or killed

Perceived risk of crashing and being injured or killed is likely to be critical to our next efforts to deter people from driving whilst fatigued.

Several well-supported theories of health-relevant behaviour- especially the Health Belief Model (Boer & Seydel,1996; Janz & Becker,1994), Protection Motivation Theory (Rogers,1983; Connor & Norman,1996), and the Precaution Adoption Model (Weinstein,1988)- identify perceived risk of harm to the self as a precursor to self-protective (or safe) behaviour. Thus, a belief that driving whilst fatigued poses a real risk to personal safety should discourage driving whilst fatigued. Further, behavioural research conducted both in Australia and worldwide provides compelling evidence that risk perception is pivotal to behaviour change (for a review see Helweg-Larsen & Shepperd, 2001).

People's understanding of the risks associated with driving whilst fatigued may be inaccurate for several reasons, each pointing toward potential strategies for targeting driver fatigue.

[4] Heavy vehicles drivers are regulated in terms of how many hours they can work and drive and how many hours they have to rest, and these regulations are enforced employing logbooks and the Safe-T-Cam network (RTA, 2001).

First, the risks posed by driving whilst fatigued are arguably not as obvious as the risks posed by drink driving and speeding, and “anti-fatigue-driving” messages have been flawed in conveying the risks of fatigue. For most people, the risk of crashing as a result of driver fatigue is perceived to be very serious but very remote (RTA, 2001). In the Community Attitude Survey conducted throughout Australia in March 2003 (Pennay, 2004) fatigue was named spontaneously as the leading cause of serious crashes by 9% of the NSW sample, and included in the top 3 causes by 27%. In contrast, speeding was included in the top 3 causes by 63% of the sample and drink driving by 45% of the sample. Nonetheless, this latter finding also reminds us that responses to this question reflect people’s perception of the frequency of the behaviour as well as its riskiness, because drink driving might be regarded as more dangerous than speeding but also as less common. In any case, it appears to be important that the crash risks of driving whilst fatigued be conveyed.

Second, people tend to underestimate their own risk relative to others, and this appears to have a direct impact on behaviour. "Illusory invulnerability" (a.k.a. “optimism bias”) refers to individuals' common belief that unpleasant events are less likely to happen to them than to their peers (for a review see Weinstein, 1989a). Stated another way, it is the belief that “it won’t happen to me”. Risks are perceived but not personalised. For example, in the road safety context, people believe that compared to their average peer they are less likely to be injured or killed in a car crash (DeJoy,1989; 1992), they are less likely to be booked for speeding (and other offences) (Job, Hamer & Walker, 1995), they are better and safer drivers (Job, 1990; Job et al., 1995; Svenson, Fishhoff & MacGregor, 1985), and they run red lights less frequently (Morgan & Job, 1995) (for a review, see Job,1999). Optimism bias regarding road trauma is proposed to promote risk-taking on the road (e.g. Weinstein, 1988, 1989a, 1989b, 1993). Although the theories of health behaviour discussed above emphasise perceived *personal* risk, we are apt to assess ourselves against others, and experimental evidence confirms that perceived *relative* risk influences behaviour at least as much as perceived *personal* risk (Klein, 1997), and this is also supported by cross-sectional data (e.g. Svenson et al., 1985; Weinstein, 1982), although some cross-sectional data is inconsistent. Thus, for example, if a driver thinks that they are less likely than their peers to become fatigued whilst driving, or that they are less likely to crash as a consequence, they could be expected to be prepared to drive whilst fatigued. Thus, it is important that the crash risks emphasised in anti-fatigued-driving campaigns are not simply applied to others, but rather that they are *personalised*; “it can happen to anyone, including me”. Simply providing information about others may do little to reduce optimism bias (see Weinstein and Lachendro, 1982).

Third, evidence suggests that people may have erroneous beliefs about behaviours and situations that protect them from the risks posed by driving whilst fatigued. In the Community Attitude Survey conducted throughout Australia in March 2003 (Pennay, 2004), when asked what drivers should do if they experience fatigue or tiredness whilst driving, responses included have a coffee (2%), wind down the window (2%), turn on music (2%) and various other inappropriate behaviours (6%) (although modal responses did involve taking a break from driving). These figures suggest some improvement from the 2002 survey (coffee: 8%; window: 5%; music: 4%; other; 15%; Mitchell-Taverner, 2002). When asked what drivers could do to reduce the likelihood of becoming tired or drowsy responses were mostly appropriate (including having sufficient rest beforehand, factoring in rest breaks, or breaks from driving) (Pennay, 2004). However, there appeared to be little awareness of the relevance of activities (other than sleep, rest or drinking alcohol) prior to the trip and 2 hours of driving seemed to be treated as a magical threshold

for fatigue (although evidence suggests that fatigue can occur within the first 2 hours of driving). Further, people may have self-serving biases (akin to illusory invulnerability; for a relevant review see Harris, 1996) in their perception of the extent to which both appropriate and inappropriate fatigue-management behaviours protect them from fatigue-related crashes.

As regards protective situations, people may think:

- of fatigue as resulting mainly from extended driving, whereas previous sleep and activity, and time of day are also important (RTA, 2005b);
- that fatigue-related crashes occur only on long trips (whereas such crashes also occur on relatively short trips). In the Community Attitude Survey conducted throughout Australia in March 2003 (Pennay, 2004), 52% of respondents who reported having fallen asleep at the wheel most recently did so on a trip of less than 2 hours' duration.
- that fatigue-related crashes only occur on country roads, when in fact in 1998-2002 21% of fatigue-related crashes occur on metropolitan roads in Sydney, Newcastle, or Wollongong (RTA, 2005b; see also Dalziel & Job, 1997a, 1997b, 1998; Fell & Black, 1997). In the Community Attitude Survey conducted throughout Australia in March 2003 (Pennay, 2004), 30% of respondents who reported having fallen asleep at the wheel most recently did so in an urban location.
- that fatigue-related crashes occur mostly late at night. In fact, fatigue-related crashes are overrepresented in the early morning (between 4am and 8am, 32% of all fatal crashes in 1996-2000), and between 12pm and 2pm (21% of all fatal crashes in 1996-2000) (RTA, 2001). Further, in 1996-2000, 55% of fatigue-related fatal crashes occurred between 6am and 6pm, because this is when most people are on the road (and when most fatal crashes occur) (RTA, 2001). In the Community Attitude Survey conducted throughout Australia in March 2003 (Pennay, 2004), 36% of respondents who reported having fallen asleep at the wheel most recently did so between midnight and 6am, although there was a fairly even spread of other times.
- that only particular types of drivers (e.g. heavy truck drivers) have fatigue-related crashes, whereas the problem is not limited to heavy truck drivers (Dalziel & Job, 1997a, 1997b, 1998; Fell & Black, 1997) and in 1996-2000 86% of the vehicles driven by fatigued drivers involved in fatigue-related crashes were cars or light trucks (RTA, 2001).

The present research will assess young people's perceptions regarding their likelihood of becoming fatigued whilst driving, and the extent to which driving whilst fatigued poses a risk to their safety. Perceptions of *relative* risk will also be assessed. Finally, the extent to which young people endorse erroneous beliefs about behaviours and situations that protect them from the risks posed by driving whilst fatigued will also be assessed. Relationships of all these risk perception variables with self-reported driving whilst fatigued will be examined.

Perceived risk of social censure

The Theory of Planned Behaviour (Madden, Ellen, & Ajzen, 1992) and its predecessor, the Theory of Reasoned Action (Ajzen & Fishbein, 1980), propose that health-relevant behaviour is influenced partly by people's expectations about the consequences of their behaviour in terms of other people's opinions. Thus, if a driver perceives a risk of social censure for drink driving, then they could be expected to avoid this behaviour. Indeed,

much of the impact of Random Breath Testing owes to its success in changing social norms regarding drink driving (Prabhakar, Lee, & Job, 1994). Rather than being thought acceptable, or even desirable (as it once was), drink driving is now thought stupid, irresponsible, criminal, even murderous (Job et al, 1993). Consequently, one of the perceived risks of drink driving is social censure. There also appears to be a slow shift in social norms regarding speeding (see Hatfield & Job, 2004; Mitchell-Taverner 2000, 2001, 2002). Shifts in social norms may be associated with changes in the perceived threat of the behaviour; as a driving behaviour is recognised to pose a threat to the driver and others, it may come to be regarded as more unacceptable. Little is known about social norms regarding driving whilst fatigued (but perhaps social censure of fatigued driving is limited to the extent that the danger it poses is underestimated). Consequently, little is known about the extent to which a perceived risk of social censure reduces people's preparedness to drive whilst fatigued.

The present research will assess social norms regarding driving whilst fatigued, and their relationship with self-reported driving whilst fatigued.

Previous public education campaigns targeting driver fatigue in NSW

Public education campaigns targeting driver fatigue in NSW rely heavily on emotional messages about the fatal consequences of driving while fatigued (RTA, 2001).

In 1996, the RTA "placed fatigue on the road safety agenda" (RTA, 2001, p.23) with the television commercial "Nightshift". This commercial depicted a young couple in a Volkswagen Kombi driving all night, drifting over the centreline and crashing into a truck. Whilst this advertisement may have raised public awareness of driver fatigue as a road safety issue, it is likely to have produced alienation and denial rather than a more accurate perception of the crash risks of driving fatigued. First, the advertisement depicted levels of tiredness that people seldom experience, let alone drive with. Thus, viewers are likely not to have identified with the characters in the advertisement, but rather to have viewed these characters as stereotypical victims of a fatigue-related crash. Research demonstrates that misperception of risk is most likely to occur where there is a stereotypical victim of an event (see Weinstein, 1980) with which one does not identify (Murphy, 2005); "only people who are that tired have fatigue-related crashes, and so it won't happen to me". Second, the advertisement depicted a horrific crash, and research suggests that use of high fear levels in public health advertising may induce denial, especially when no recommendations for appropriate behaviours are made to reduce fear (and provide reinforcement, see Job, 1988).

In 1998 a campaign featuring the television commercial "Deadly boring" aimed to communicate that "the tedious nature of driving, particularly for two hours or more can lead to loss of concentration, which can result in a crash" (RTA, 2001, p.24). This time the campaign had a clear behavioural message: "Every two hours. Stop. Revive. Survive". However, the campaign may have created two related (and potentially dangerous) myths: that it is the act of driving that results in fatigue (independent of other circumstances and previous activities), and that fatigue is not a problem before 2 hours of driving.

December 2001 saw the launch of the "microsleeps" campaign featuring Dr Karl Kruszelnicki. This campaign showed the consequences of microsleep while driving *from*

the driver's point of view, and urged drivers to recognise the early warning signs of fatigue (which were identified) and to Stop Revive Survive (RTA, 2005a). This advertisement is more likely than the previous advertisements to result in drivers *understanding* and *personally identifying* with the risks of driving fatigued, which are both important in motivational terms. Again, a clear behavioural message was included.

A campaign building on the "microsleeps" campaign was launched in April 2003 and explained that the risk of a fatal fatigue crash is four times greater between 10pm and 6am than for the rest of the day because circadian rhythms are programming the body to sleep (RTA, 2005a). There may be some concern that this propagates a myth that fatigue-related crashes do not happen during the day.

Driver fatigue issues are also addressed within the NSW Road Safety Education program which supports the delivery of road safety education through the Personal Development, Health and Physical Education curriculum that is compulsory in all NSW schools from Kindergarten to Year 10. The resources offered as part of this program essentially "define driver fatigue and describe strategies to avoid it". Again, motivational issues appear to be given inadequate attention.

Few campaigns provide explicitly *personalised* information of the likelihood of crashing if driving when fatigued.

Strategies such as the Driver Reviver Program (commencing formally around 2000) may address motivational issues to some extent; reducing costs associated with *not* driving whilst fatigued by giving drivers something to do, and something to eat and drink, while they rest.

The limited efficacy of these campaigns is suggested by trends in the proportion of crashes attributed partly to fatigue since 1996 taken in conjunction with the history of relevant campaigns outlined above [see Table 1, Column 1].

Table 1: Percentage of fatal crashes for which fatigue was identified as a factor (from RTA statistical reports), and percentage of Community Attitude Survey NSW sample naming fatigue as leading contributing factor, or amongst top 3 contributing factors to serious crashes, for the years 1996-2002

Year and associated advertising campaign	Percentage of fatal crashes for which fatigue was identified as a factor	Percentage of sample naming fatigue as leading factor in CAS, 2003 (NSW)	Percentage of sample including fatigue in top 3 factors in CAS, 2003 (NSW)
1995	16%	n/a	n/a
1996; "Nightshift"	16%	n/a	n/a
1997	18%	n/a	n/a
1998; "Deadly boring"	19%	n/a	n/a
1999	18%	13	39
2000	20%	10	34
2001; "Microsleeps"	15%	14	33
2002	19%	15	40
2003; "Circadian rhythms"	14%	9	27

NSW crash data [see Table 1, Column 2] does not suggest any reduction in the percentage of fatal crashes for which fatigue was identified as a factor in consequence of the “Nightshift”, “Deadly boring”, or “Microsleeps” campaign. Of course, any reduction may be masked by other (possibly correlated) influences, such as increased police awareness resulting in more frequent identification of fatigue as a factor. Data regarding community awareness of fatigue as a road safety issue are available from the Community Attitude Survey only from 1999 onwards (Mitchell-Taverner, 2001, 2002; Pennay, 2004) [see Table 1, Column 3]. These data suggest some efficacy of the “Microsleeps” campaign. In 2000 fatigue was named spontaneously as the leading cause of serious crashes by 10% of the NSW sample, compared to 14% in 2001 and 15% in 2002. Fatigue was included in the top 3 causes by 34% of the NSW sample in 2000, by 33% in 2001 and by 40% in 2002. These data are mute regarding the issue of whether the perceived crash risks of fatigue are personalised. Neither crash data nor Community Attitude Survey data are available to give an indication of the efficacy of the 2003 “circadian rhythms” campaign.

Young drivers as a specific target audience

The motivational factors discussed above are likely to impact on young people differently than on older drivers, and indeed this may contribute partly to the over-involvement of young drivers in fatigue-related crashes, as well as in road trauma more generally.

The over-involvement of young people in road trauma may occur for a variety of reasons (for reviews see Jonah, 1986; Jonah & Dawson, 1987; Williamson, 2000). For example, because young drivers tend to be inexperienced drivers they may lack the skills to deal with difficult situations on the road. They may also have greater exposure to risk due to driving at dangerous times, such as late at night after going out (especially on Friday or Saturday nights). However, an important factor in the over-involvement of young drivers in road trauma is likely to be their tendency to engage in more risky driving behaviours than older drivers (Job, 1999; Jonah, 1986). This tendency may in turn owe to an inaccurate perception of risk (partly resulting from lack of experience) or different social pressures (for example from peers), as well as more positive attitudes toward risk (risk propensity; see Rohrmann, in preparation).

In the Community Attitude Survey conducted throughout Australia in March/April 2002 (Mitchell-Taverner, 2002) fatigue was named spontaneously as the leading cause of serious crashes by 11% of 15-25 year olds, compared to 16% of 25-39 year olds (but 10% of 40-59 year olds). Fatigue was included in the top 3 causes by 37% of 15-25 year olds, compared to 39% of 25-39 year olds (but 34% of 40-59 year olds).

Young people demonstrate illusory invulnerability in the road safety context, although whether more so than older people is unclear (for “yes” see Jonah, 1986; for “no” see Job 1995). Young people are particularly subject to social pressure from their peers (Hodgdon et al., 1981; Jessor et al, 1981; both cited in Jonah, 1986), and often the social norms operating in this group are pointedly different from those operating in society at large (possibly serving the role of expressing independence, rebellion against parents and authorities, and so forth; see Hodgdon et al., 1981; Jessor et al, 1981; both cited in Jonah, 1986).

Further, lifestyle factors may contribute to the tendency to drive whilst fatigued, and again young people are likely to differ from older people in terms of such factors. For example,

amongst long distance truck drivers, fatigue and vigilance are influenced by drug use (de Geir,1995; Starmer, Mascord, Tattam & Vine,1993) and by long periods of solo driving (YCHW, Dalton, & Fell,1992). Both of these factors, and others, may be particularly prominent amongst young drivers (compared to older drivers), as may involvement in fatigue-inducing activities such as sports and partying. Such lifestyle factors will be investigated in the present research program.

Because of differences between young and older drivers in terms of several factors that may influence fatigue, interventions should be specifically targeted at young people to counter driving whilst fatigued in this (over-represented) group. The present research program aims to collect information *from young people* regarding their beliefs, attitudes, lifestyle factors, and behaviours relating to driving whilst fatigued (in Study 1). This information will be used, in conjunction with existing theory and evidence, to develop messages that are *specifically targeted at young people* to reduce their tendency to drive whilst fatigued (which will be evaluated in Study 2). It is anticipated that these messages will focus strongly on correcting misperceptions about the risks associated with driving whilst fatigued.

Aims of the present research program

The present research project aims to:

1. Examine young people's familiarity with basic information about driving whilst fatigued (e.g. early warning signs) (Study 1);
2. Assess young people's beliefs about penalties for driving whilst fatigued (Study 1);
3. Assess young people's perceptions of the crash and injury risk associated with driving whilst fatigued (Study 1);
4. Assess young people's perceptions of the crash and injury risk associated with driving whilst fatigued *relative to their peers* (illusory invulnerability) (Study 1);
5. Assess young people's perceptions regarding their likelihood of becoming fatigued whilst driving, as well as their *relative* likelihood (Study 1);
6. Investigate the extent to which young people endorse erroneous beliefs about behaviours and situations that protect them from the risks posed by driving whilst fatigued (Study 1);
7. Assess young people's perception of social norms regarding driving whilst fatigued (Study 1);
8. Examine the extent to which young people report driving whilst fatigued, and under which circumstances (Study 1);
9. Examine the extent to which young people report having experienced a crash or near-crash, and investigate the perceived contributing factors;
10. Examine the relationship of self-reported driving whilst fatigued and experience of fatigue-related incidents, with the beliefs and attitudes outline above.
11. Investigate differences between young people from metropolitan and rural areas in terms of the variables outlined above. The possibility of differences is evident in the findings of the Community Attitude Survey conducted annually throughout Australia usually around March (Mitchell-Taverner, 2001, 2002; Pennay, 2004). In 2002 fatigue was named spontaneously as the leading cause of serious crashes by 28% of the participants from capital cities, compared to 43% of other participants;
12. Identify factors that may be manipulated in order to reduce the tendency of young people to drive whilst fatigued;

13. Develop messages that are *specifically targeted at young people* to reduce their tendency to drive whilst fatigued, based on Study 1 results, as well as relevant theory and research relating to risk perception;
14. Evaluate these messages amongst young people in terms of changes in attitudes, beliefs and intended behaviours (Study 2).

Study 1

Methods

Sampling & participants

At random, pages were selected from the Sydney metropolitan phonebook, and an equal number of pages from various regional telephone books. Starting from the first number on each page, interviewers called every third listing, excluding businesses. At least half of the calls were outside work hours, but not before 9.30am on Saturdays, or before 10.00am on Sundays. Interviewers asked for a person living at the residence aged between 17 and 25 who holds a current drivers license to participate in a study investigating "attitudes to driving" for the University of Sydney. Potential participants were told that the interview would take between 20 and 25 minutes.

A number was abandoned at the first call if no licensed driver or rider lived at residence, if no driver living at the residence was in the required age range, if the person answering or the target person had insufficient English to understand the interviewer, if the person answering refused to proceed, or if the target person refused to proceed (and these outcomes were recorded as "no L", "Wrong age", "No E", "Refuse A", and "Refuse T", respectively). Three calls back were made (preferably over two days, and separated by at least one hour) if an appropriate target lived at the residence but was unavailable, or if the number was engaged, not answered, or answered by an answering machine. "Unavailable target" or "No answer" was recorded after each of these outcomes being repeated 3 times.

With exclusions for all of the reasons provided above, as well as refusals, the response rate was 25.37%.

259 NSW drivers with a mean age of 20.99 years participated in the study. 46.1 % of participants were male and 64.9 % lived in the Sydney metropolitan area.

Materials

Telephone interview record sheet

A telephone interview record sheet was constructed to record each telephone number called, and the corresponding name and page in the telephone book, the outcome of the call (e.g. "No E"), and the final outcome for the number (e.g. "Unavailable target") [see Appendix A]. Possible outcomes are described in the "Sampling and participants" Section.

Structured interview protocol & record form

A structured telephone interview was designed specifically for this study, and measured young drivers' risk perceptions, attitudes, and behavioural practices in relation to road safety in general, and to driver fatigue specifically [see Appendix B]. Data was also collected regarding socio-demographic variables and aspects of driving experience.

After two initial questions designed to obtain an unprompted indication of the perceived "fatigue problem" [Q1 and Q2, described below], fatigue was defined to participants as "feeling fatigued or tired". While a more precise definition of fatigue is necessary to

properly investigate and combat it (Job and Dalziel, 2000), this lay definition seemed appropriate for the present purposes.

Knowledge of, and attitudes toward, penalties for driving whilst fatigued were assessed by asking respondents whether any of a fine, demerit points, a jail term, loss of license, restricted license or a warning applied (all Yes/No). For any relevant penalties, respondents were asked to indicate the magnitude of the penalty [Q10]. Respondents indicated whether police could detect a driver being too fatigued to drive for the respondent (Yes/No), or for the "average driver of their age and sex" (Yes/No) [Q14]. Respondents then indicated which of 7 methods police use to detect fatigue in drivers [see Table 2]. Respondents were also given the opportunity of responding "nothing", or listing any other methods [Q15]. Respondents rated their chances of being pulled over by police for negligent driving due to fatigue, compared to the "average driver of your age and sex" [Q17]. Response options were: much lower than average, lower than average, the same as average, higher than average, or much higher than average.

Table 2: Methods by which police detect driver fatigue offered in Study 1 interview

Breath testing
Reflex testing
Saliva testing
Eye exams
Pulling you over and talking to you
Urine sample
Judgment of your driving manner

Several questions tapped *crash risk perceptions*. For the sake of parallel with the Community Attitude Surveys, and to obtain an unprompted indication of the extent to which driver fatigue is perceived as a road safety problem *for young drivers*, participants *first* listed "the three most common causes of serious crashes involving young drivers, beginning with the most common" [Q1]. As discussed earlier responses are likely to reflect the perceived frequency of the behaviour as well as its perceived riskiness. Participants then indicated the percentage of all serious crashes involving young drivers caused by each of driver fatigue, speeding, drink driving, inexperience on the road, poor road conditions, and using a mobile phone [Q2]. Later in the interview, respondents indicated the extent to which they felt that driving whilst fatigued increases the chances of having a car crash [Q6]. Possible responses were: not at all, slightly, moderately, or considerably.

Perceived relative crash risks were measured by asking respondents to rate their chances of crashing when not fatigued, or crashing when fatigued, compared to an average peer [Q17]. Response options were: much lower than average, lower than average, the same as average, higher than average, or much higher than average. Using the same responses, participants indicated their relative driving safety and their driving skill, both when fatigued and not fatigued, as well as their amount of driving experience [Q17].

For each of 11 "*techniques people use to keep themselves alert whilst driving*" [see Table 3] respondents indicated whether they had ever used the technique, and how they thought it alters the risk of having a crash: lowers risk, increases risk, or makes no difference [Q7]. Respondents also indicated whether they had ever taken public transport, asked a friend or relative to drive, delayed or abandoned a trip, or used a Driver Reviver Station "in order

to avoid driving because you were fatigued", and listed other techniques they could think of [Q8].

Table 3: Techniques to keep alert whilst driving offered in Study 1 interview

Wind down the window to feel a breeze
Turn the music up or sing
Chew gum or eat whilst driving
Drive faster
Chat with others in the car
Talk on a mobile phone
Stop on the side of the road and have a rest
Drink or take caffeine (coffee, coke, red bull, guarana tablets)
Think about other things
Try to keep your eyes wide open
Take drugs to keep you awake or alert

Participants were invited to agree that driver fatigue mainly affects one of 4 types of driver offered [see Table 4], or that driver fatigue can affect anyone [Q16]

Table 4: Types of drivers that mainly experience driver fatigue offered in Study 1 interview

People driving long distances
People driving on country roads
Older drivers
Drivers without skill or experience

Respondents indicated how many hours and/or minutes they could drive before feeling fatigued, "provided you have had a good night sleep and have been awake for a few hours before starting to drive" [Q12]. Respondents answered a parallel question in relation to "the average driver of your age and sex" [Q13]. Respondents also rated their chances of becoming fatigued when driving short distances and when driving long distances compared to the "average driver of your age and sex" [Q17]. Response options were: much lower than average, lower than average, the same as average, higher than average, or much higher than average.

Normative attitudes to driving whilst fatigued, driving with a blood alcohol concentration of 0.07 rather than 0.05, and speeding at 80km/hr in a 60km/hr zone were assessed by asking respondents to describe a young driver knowingly doing each of these behaviours, using only one of the following terms (in each case): sensible, "just doing what everyone else does", a little bit silly, stupid, irresponsible, criminal, or a potential murderer [Q9]. Respondents answered questions relating to the penalties that *should* apply, that were parallel to the earlier questions about which penalties *do* apply [Q11], again indicating normative attitudes.

In order to assess *perceived symptoms of fatigue*, participants were asked which of 10 possible symptoms they had experienced [see Table 5], and to list any others [Q3].

Table 5: Symptoms of driver fatigue offered in Study 1 interview

Sore eyes
Headache
Heavy eyelids
Slower reflexes
Nodding off at the wheel
Hard to concentrate
Feeling bored
You experience a microsleep
Can't see very well
Oversteering

Frequency of driving whilst fatigued was reported for the self, the "average driver" and "the average driver of the same age and sex" [Q4a-c]. Possible responses were: three or more times a week, once or twice a week, once or twice a month, less than once a month, or never.

Respondents indicated whether, when driving whilst fatigued, they had ever had a crash (Yes/No) or a near-crash (Yes/No) [Q5a-b]. If respondents answered "Yes" to either, they were asked which of 7 factors contributed to their feeling fatigued [see Table 6], and to list any others [Q5c].

Table 6: Factors contributing to driver fatigue that resulted in crash offered in Study 1 interview

Work
Nightclubbing
Socialising with friends
Studying
Driving for a long time
Lack of sleep
Nothing in particular

Respondents indicated via which of 9 media [see Table 7] they had heard about driver fatigue [Q18], and listed any others.

Table 7: Media via which respondents heard about driver fatigue offered in Study 1 interview

Television ads
Road signs
Billboard or roadside posters
Magazines or newspapers
Websites
School programs
Public venues
Cinema ads
In the news

Data was then collected regarding socio-demographic variables (e.g. age, gender, main language spoken at home, highest level of education, occupation and employment situation e.g. shiftwork, and postcode) and aspects of driving experience (e.g. driver's license status, year and month of receiving Learner license, time spent driving per week, and ownership of usual vehicle).

Finally, the interviewer asked for the name of the participant to facilitate call-backs for data verification purposes.

The average duration of the interview was approximately 20 minutes.

Procedure

Third year Health Psychology students were trained to administer the telephone survey according to the standard interview protocol. The telephone survey was conducted according to the procedure described in "Sampling and participants". Results of each phone call were coded and recorded systematically in the telephone interview record sheet. Responses to the interview were recorded by the interviewer on the interview record form. For data quality assessment, 10 per cent of all surveys were verified by the supervising researcher calling and checking responses to key questions.

Statistical analysis

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS). For all statistical comparisons a Type I error rate of .05 was adopted.

First, descriptive statistics are provided to characterise the sample.

Then, for each variable relating to driving whilst fatigued, descriptive statistics are provided for the whole sample, before statistics are reported for age, gender, and region (rural versus metropolitan) comparisons. For age, the 20-22 year age group was compared to the 17-19 year age group and to the 23-25 year age group, separately. For categorical dependent variables (e.g. existence of penalties) the analysis employed was the Mann-Whitney U-test (a non-parametric independent samples test). For continuous dependent variables (e.g. magnitude of penalties) the analysis employed was ANOVA (with planned contrasts).

Associations with self-reported frequency of driving whilst fatigued were assessed employing ANOVA (categorical variables) or Pearson product-moment correlations (continuous variables). Associations with self-reported experience of fatigued-related incidents (crash or near-crash) were assessed employing ANOVA (continuous variables) or Mann-Whitney U-test (categorical variables).

Results and discussion

Sample characteristics

Table 8 presents descriptive information regarding the personal characteristics and driving experience of the sample employed for Study 1.

Table 8: Personal characteristics and driving experience of the sample employed for Study 1

Characteristic	Number (%)
Age (years)	
17-19	78 (31.1)
20-22	87 (34.7)
23-25	86 (34.3)
Mean (s.d.)	*20.99 (2.51)*
Gender	
Female	139 (53.9)
Male	119 (46.1)
Highest level of education	
Primary school only	0
Year 7-9	7 (2.7)
School certificate	44 (17.2)
HSC	57 (22.3)
Tafe or equivalent	33 (12.9)
Tertiary	115 (44.9)
Occupation	
Student	113 (44.0)
Professional/managerial	35 (13.7)
Tradesperson	34 (13.3)
Clerical	16 (6.3)
Retail/sales	15 (5.9)
Manual/factory worker	5 (2.0)
House duties	3 (1.2)
Truck driver	3 (1.2)
Courier	1 (.4)
Other occupation	26 (10.2)
Unemployed	5 (1.9)
Hours worked	
Normal hours	179 (69.1)
Shiftwork	53 (20.5)
Nightshift	16 (6.2)
Hours not specified	11 (4.2)
Main language spoken at home	
English	221 (90.9)
Spanish	6 (2.5)
Greek	5 (1.9)
Arabic	4 (1.6)
Chinese	3 (1.2)
Other	4 (1.9)

Characteristic	Number (%)
Type of driver's license held	
Learners	20 (7.8)
Old P's	3 (1.2)
Red P-plates	49 (19.0)
Green P-plates	43 (17.0)
Full license	133 (51.8)
Motorcycle	2 (0.8)
Large vehicle	4 (1.6)
License disqualified	2 (0.8)
Years since Learner's obtained	
Mean (s.d.)	*4.44 (2.38)*
Mean number of hours spent driving each week	
<5	64 (25)
5-9	59(23.0)
10-14	58 (22.7)
15-20	46 (18.0)
>20	29 (11.3)
Mean (s.d.)	*11.98 (11.96)*
Vehicle ownership	
Own vehicle	163 (63.9)
Leased vehicle	4 (1.6)
Borrowed vehicle	78 (30.6)
Company vehicle	10 (3.9)

The sample achieved a reasonably balanced distribution across age and gender. The education level and socioeconomic status of the sample may be somewhat higher than those of the general population of young drivers.

Several unsurprising associations with age were observed. Compared to older drivers, younger drivers were more likely to have a Learner license (17-19 vs.20-22: Z= -8.16; p<.001; 20-22 vs. 23-25: Z=-2.396, p=.017), held their license for fewer years ($F_{.05, 2, 243}$=183.68, p<.001), and were less likely to own their own vehicle (17-19 vs. 20-22 only; Z=-3.64, p<.001; 49.4% vs. 66.3%). 20-22 year olds were more likely to have reached university than 17-19 year olds (Z=-3.496, p=.000; 51.2% vs. 26.9%), but did not differ significantly from 23-25 year olds (Z=-.307, p=.759). Compared to 20 – 22 year olds, significantly more 17-19 year olds reported being students (Z=-3.64, p<.001; 45.3% vs. 73.1%), but significantly fewer 23-35 year olds did (Z=-3.25, p=.001; 45.3% vs. 19.0%). No significant association with age was observed for hours driven per week, language spoken or work hours, or (all p's >.26).

Males reported a significantly higher number of hours spent driving per week than females ($F_{.05, 1, 254}$=5.35, p=.021; 13.82 hours vs. 10.38 hours). Females were more likely than males to have reached university (Z=-1.996, p=.046; 50.4% vs. 38.7%). No significant association with gender was observed for license classification, number of licensed years, vehicle ownership, language, occupation, or hours worked (all p's >.12).

Urban respondents had attained a higher level of education than rural respondents (Z=-3.841, p=.000; 51.8% university vs. 31.5%), and were less likely to speak English at home (Z=-2.20, p=.028; 87.7% vs. 96.6%). No significant association with region was observed

for hours driven per week, license classification, number of licensed years, vehicle ownership, occupation, or hours worked (all p's >.12).

Knowledge of, & attitudes towards, penalties for driving whilst fatigued

Existence & magnitude of penalties

Figure 1 presents the percentage of respondents reporting a belief in the existence of each of 6 offered types of penalty for driving whilst fatigued, as well as the percentage reporting the existence of "no penalty" or "don't know".

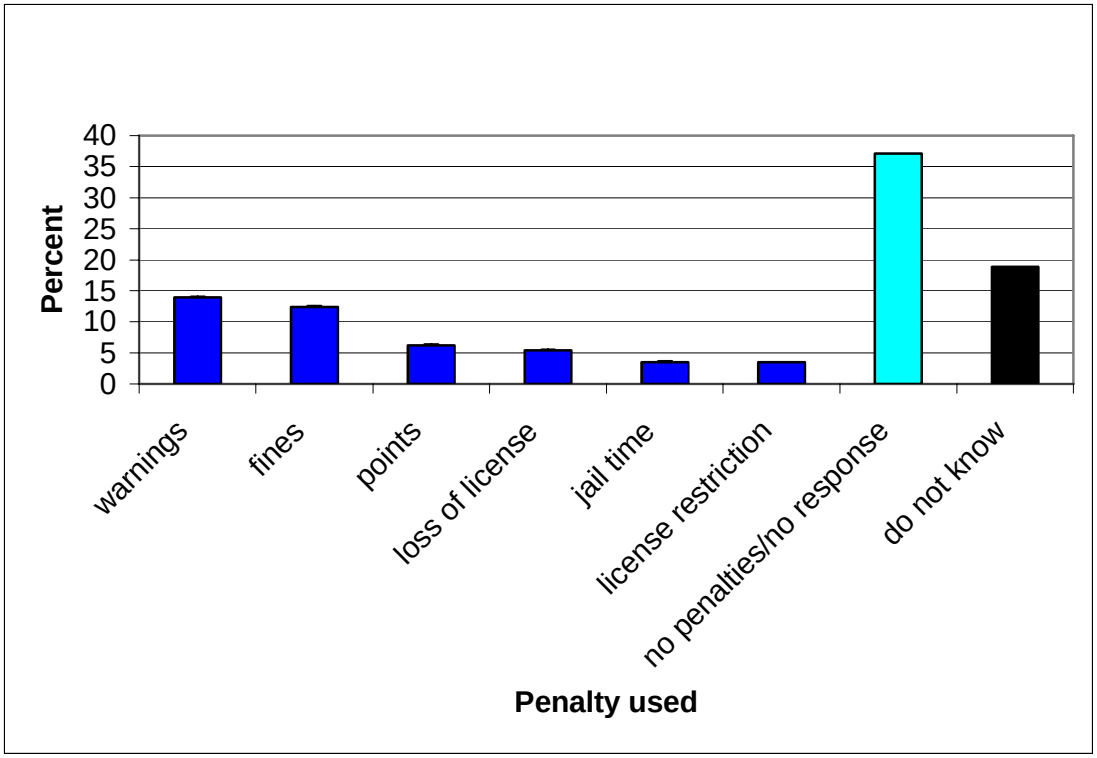


Figure 1: Percentage of respondents reporting a belief in the existence of each of 6 offered types of penalty for driving whilst fatigued, as well as the percentage reporting the existence of "no penalty" or "don't know"

Over 35% of respondents were aware that there are no penalties for driving whilst fatigued.

20-22 year olds were significantly more likely to report that there are no penalties for driving whilst fatigued than were 17-19 year olds (Z=-2.68, p=.007; 84.4% vs. 57.9%) or 23-25 year olds (Z=-2.13, p=.033; 84.4% vs. 65.4%). Males were significantly more likely than females to report that there are no penalties for driving whilst fatigued (Z=-2.25, p=.025; 78.8% vs. 61.1%). Metropolitan respondents were significantly more likely than rural respondents to report that they didn't know whether there are penalties for driving whilst fatigued (Z=-4.26, p<.001; 84.2% vs. 37.8%). There was no further significant

difference in beliefs regarding the existence of penalties by age (all p's >.114), gender (all p's >.105), or region (all p's > .095).

Amongst those who reported believing that there is a fine for driving whilst fatigued, the average estimate for the fine was $461 (range: $63 - $4,000). Amongst those who reported believing that there are demerit points for driving whilst fatigued, the average estimate for the demerit points was 2 (range: 1 – 3 points). Amongst those who reported restriction of license as a penalty for driving whilst fatigued, the average estimate for the period of license restriction was 77 days (range: 1 – 365 days). Amongst those who reported loss of license as a penalty for driving whilst fatigued, the average estimate for the period of license suspension was 29 days (range: 6 – 72 days). Amongst those who reported a jail term as a penalty for driving whilst fatigued, the average estimate for the period of incarceration was 17 days (range: 1 – 90 days).

Age, gender, and region comparisons of penalty magnitudes were not conducted because of the low numbers of respondents who identified a penalty (and so estimated a penalty magnitude).

These results suggest a moderate level of awareness that no penalties currently apply for driving whilst fatigued. This awareness was highest amongst 20 - 22 year olds, and amongst males.

Ability of police to detect fatigue in drivers

36.3% of respondents reported that police were able to detect if they were too fatigued to drive, and 35.9% reported that police were able to detect if their average peer were too fatigued to drive. Responses to this question did not differ significantly by age, gender or region (all p's > .08).

Thus, only around one third of the sample believed that police can detect a fatigued driver, and some of these respondents may not believe there are penalties anyway.

Methods used by police to detect fatigue in drivers

Figure 2 presents the percentage of respondents reporting a belief in the use of each of 7 offered methods used by police to detect fatigue in drivers, as well as the percentage reporting "no current method".

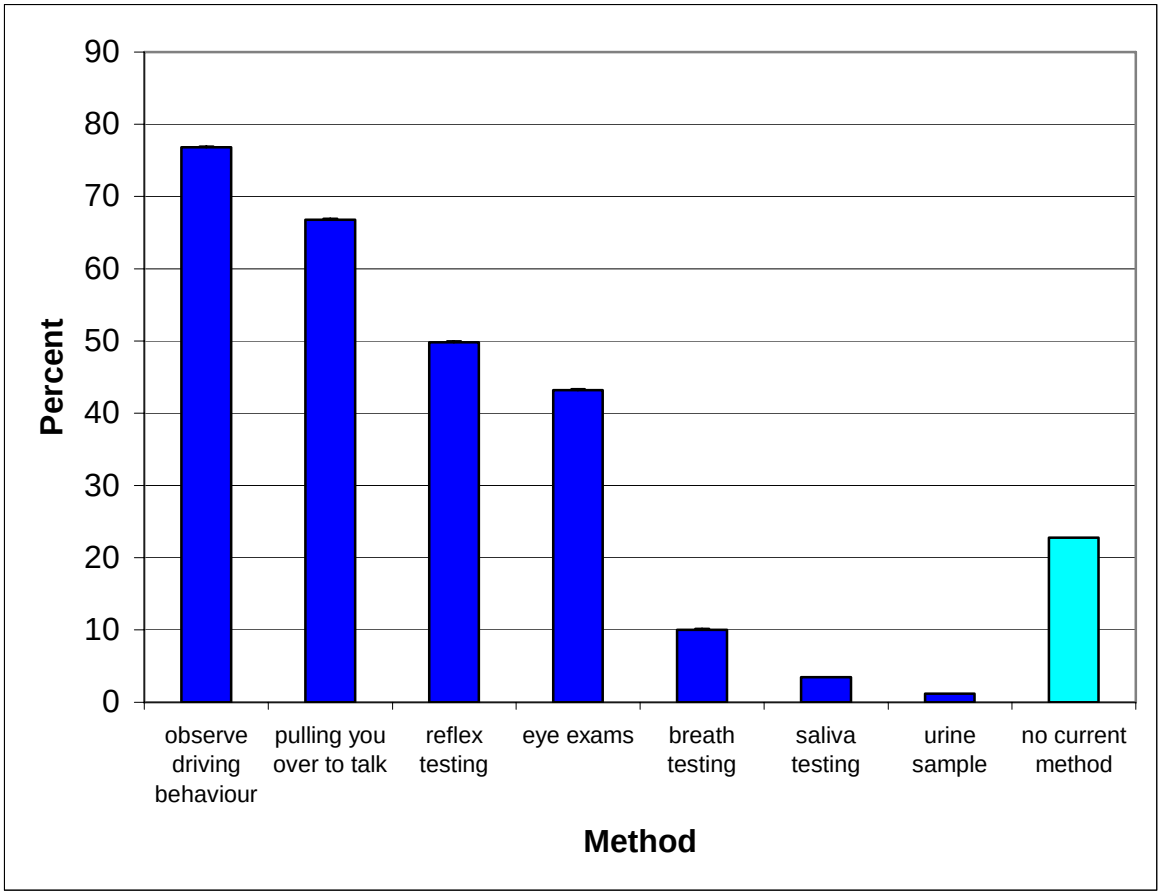


Figure 2: Percentage of respondents reporting a belief in the use of each of 7 offered methods used by police to detect fatigue in drivers, as well as the percentage reporting "nothing".

About one fifth of the sample believed that police are not currently using any method to detect fatigue. Although quite large numbers of respondents thought that various methods are being used, these methods must be regarded as rather ineffective (given that only about one third of the sample think that police can detect a fatigued driver).

20-22 year olds were significantly less likely than were 17-19 year olds to report the use of reflex testing (Z=-2.56, p=.010; 45.7% vs. 66.2%) and eye exams (Z=-2.625, p=.009; 39.8% vs. 60.8%). Males were significantly more likely than were females to report that no fatigue detection techniques were employed (Z=-2.72, p=.006; 62.5% vs. 37.5%), and significantly less likely to report the use of an eye exam (Z=-1.974, p=.048; 40.2 % vs. 53.1%). No further differences in reported police fatigue detection methods were observed by age (all p's >.051), gender (all p's >.104), or region (all p's >.102).

Relative risk of being pulled over for negligent driving due to driving whilst fatigued

Respondents mean estimate of their chances of being pulled over for negligent driving due to driving whilst fatigued compared to their average peer was 2.47 (s.d.=1.01) on a scale from 1 (much lower than average) to 5 (much higher than average). Because this score

was significantly lower than 3 (the same as average; $t_{.05, 252}$ =-8.30, p<.001), an optimistic bias was present in the sample, which would be likely to undermine any deterrence from driving whilst fatigued (see Weinstein, 1989). There were no differences in responses to this question by age, gender, or region (all p's>.07).

Taken together, the results regarding penalties and detection suggest that perceived risk of penalty is unlikely to be a strong deterrent to driving whilst fatigued amongst young people.

Crash risk of driving whilst fatigued

The 3 most common causes of serious crashes involving young drivers

Driver fatigue/inattention was identified as the most common cause of serious crashes involving young drivers by 9.1% of the sample, third after both speeding (41.3%) and drink driving (29.8%). The proportion naming fatigue corresponds to that observed in the 2003 Community Attitude Survey (Pennay, 2004).

In fact, of 181 fatal crashes involving young drivers (17 – 25 years old) on NSW roads in 2003, 11% were held to involve fatigue, compared to 33% for speed and 20% for drink driving (RTA, 2004a). Thus, the 41.3% of the sample naming speed as the most common cause are "correct" (assuming the accuracy of the RTA classifications).

Driver fatigue/inattention was included amongst the 3 most common by 47.5% of the sample, third after both drink driving (85.3%) and speeding (74.4%) [see Figure 3]. It is probably accurate to include fatigue amongst the 3 most common causes of serious crashes amongst young drivers.

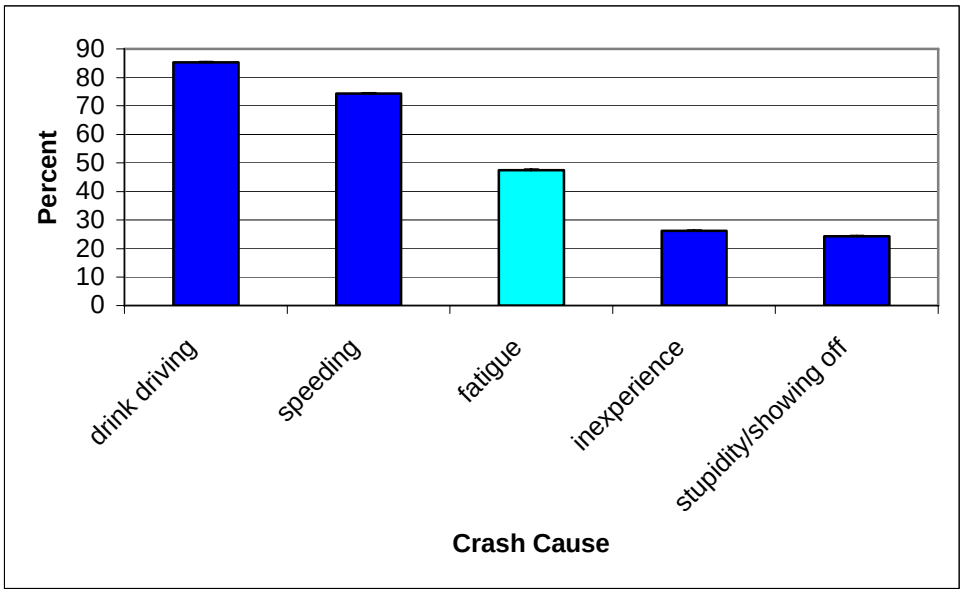


Figure 3: Percentage of respondents including fatigue amongst the 3 most common causes of serious crashes involving young drivers

34.8% of 17-19 year olds included fatigue amongst the 3 most common causes of serious crashes involving young drivers, making it the 4th most commonly included factor after drink driving (92.7%), speeding (63.0%) and stupidity (36%). Fatigue was included by 54.1% of 20-22 year old drivers, making it the 3rd most commonly included factor after drink driving (87.1%) and speeding (79.7%). Fatigue was included by 52.8% of 23-25 year olds, making it the 3rd most commonly included factor after drink driving (79.5%) and speeding (78.6%).

Fatigue/driver inattention was included by 50.1% of males, following speeding (70.7%) drink driving (62.3%). For females, fatigue/driver inattention was included by 45.2%, following drink driving (86.6%) and speeding (77.3%).

Fatigue/driver inattention was included by 47.7% of urban participants, following drink driving (87.9%) and speeding (75.5%). For rural participants, fatigue/driver inattention was included by 46.7% of respondents, following drink driving (81.2%) and speeding (71.2%).

17-19 year olds were less likely than 20-22 year olds to included fatigue amongst the 3 most common causes of serious crashes involving young drivers ($Z = -2.29$, $p=.02$; 26.9% vs. 44.2%). No further differences in this variable were observed by age, gender, or region (all p's >.43).

On balance, these results suggest some awareness that fatigue is an important contributor to serious crashes, as well as a recognition that fatigue is not as frequent a contributor as speeding or drink driving. 17-19 year olds may be less likely than slightly older "young drivers" to recognise the risks posed by fatigue. Recognition of the risk posed by a behaviour is an important first step in deterring the behaviour, however it is important that the risk be personalised (see Weinstein, 1989), and these data are mute regarding the extent to which the risks posed by driving whilst fatigued are personalised.

Percentage of serious crashes involving young drivers caused by various factors (including driver fatigue)

Figure 4 presents the percentage of serious crashes involving young drivers estimated to be caused by each of 6 offered factors.

On average, fatigue was estimated to be the cause of 28.26% of serious crashes (s.d.=18.27%), compared to 45.87% for speeding (s.d.=18.99), 34.10% for drink driving (s.d.=19.40), 23.29% from driver inexperience (s.d.=19.37), 16.32% poor road conditions (s.d.=16.63) and 18.55% mobile phone use (s.d.=19.01).[5]

Again, of 181 fatal crashes involving young drivers (17 – 25 years old) on NSW roads in 2003, 11% were held to involve fatigue, compared to 33% for speed and 20% for drink driving (RTA, 2004a). Thus, respondents were fairly accurate in their ordering of crash causes, but overestimated the percentages- a common error when people are asked to manipulate percentages.

[5] The percentages total over 100%, although theoretically they should total 100% or less. However, participants were not removed from analyses if the total of their responses exceeded 100%, in order to avoid biased selection for intelligence.

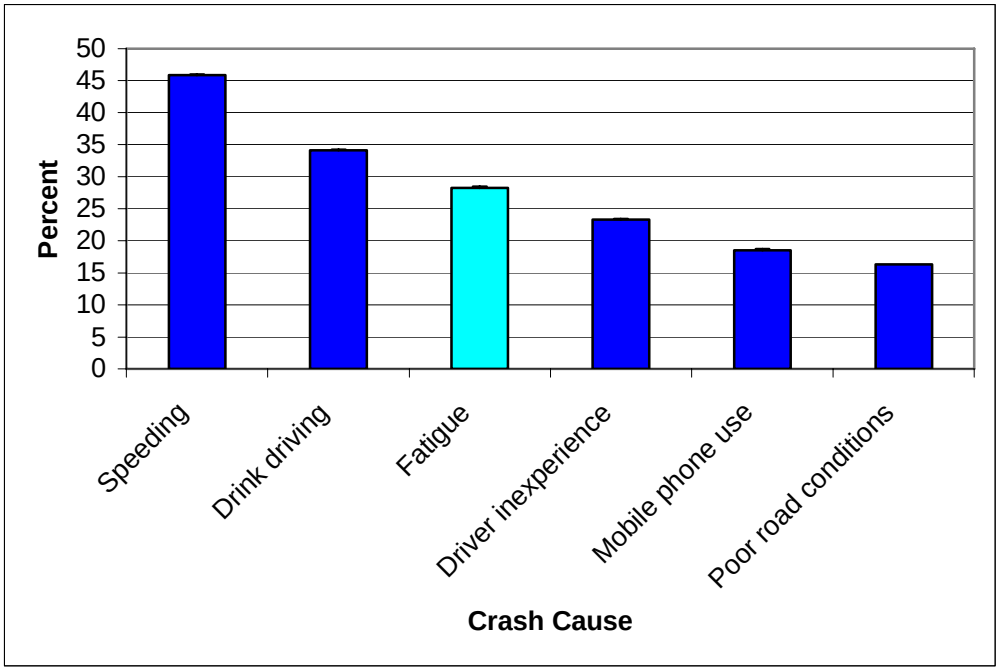


Figure 4: Mean percentage of serious crashes involving young drivers estimated to be caused by each of 6 offered factors.

20-22 year olds rated inexperience as contributing to a lower percentage of serious crashes than did 17-19 year olds ($t_{1,143.29}$= 2.15, p=.033; 19.20% vs. 25.19%) or 23-23 year olds ($t_{1,148.52}$= -2.25 , p=.026; 19.20% vs. 25.73%). Males rated drink driving, road conditions, and mobile phone use, as contributing to a lower percentage of serious crashes than did females (36.80% vs. 31.26%, $F_{.05, 1, 256}$=5.32, p=.022; 18.75% vs. 14.06%, $F_{.05, 1, 254}$=5.08, p=.025; 21.96% vs. 15.83%, F.05, 2, 254=6.56, p=.011, respectively). There were no further significant differences in percentage of serious crashes attributable to any factor by age (all p's >.565), gender (all p's >.405), or region (all p's >.310). Thus there were no differences regarding fatigued driving by age, gender, or region.

Thus, again, fatigue appears to be recognised as an important contributor to serious crashes. Again, it is not clear whether this risk is personalised.

Increase in crash risk due to driving whilst fatigued

Respondents' mean estimate of the extent to which driving whilst fatigued increases the chances of having a car crash "in good conditions" was 2.18 (s.d.=.89) on a scale from 0 (not at all) to 3 (considerably), corresponding most closely to a rating of 'moderately'. There was no significant difference in responses to this question by age, gender or region (all p's > .155).

Again, there appears to be recognition that driving whilst fatigued increases crash risk, although there may be room to strengthen this perception.

Taken together, results suggest that fatigue is recognised as a contributor to crash risk, though (probably appropriately) not as frequent a contributor as speeding or drink-driving.

Direct assessment of the extent to which fatigue is perceived to increase crash risk suggests some room for improvement. These results do not indicate the extent to which the perceived crash risks associated with fatigue are personalised.

Perceived relative crash risks of driving whilst fatigued, & self-serving biases

Respondents' mean estimate of their chances of crashing when fatigued compared to their average peer was 3.19 (s.d.=.89) on a scale from a scale with 1 (much lower than average) to 5 (much higher than average). Because this score was significantly higher than 3 (the same as average; $t_{.05,\ 251}$ =3.48, p=.001), a pessimistic bias was present in the sample. There were no differences in responses to this question by age, gender or region (all p's >.25).

Respondents' mean estimate of their chances of crashing when not fatigued compared to their average peer was 2.19 (s.d.=.86) on the same scale. Because this score was significantly lower than 3 (the same as average; $t_{.05,\ 252}$ =-14.98, p<.001), an optimistic bias was present in the sample.

There was a significant difference between the relative ratings of chance of crashing when not fatigued compared to crashing when fatigued ($t_{.05,\ 281}$=-15.63, p<.001), with a mean difference between the relative ratings of -1.00 (s.d=1.02).

Respondents' mean estimate of their driving safety when fatigued compared to their average peer was 2.84 (s.d.=.84) on the same scale. Because this score was significantly lower than 3 (the same as average; $t_{.05,\ 252}$ =-3.08, p=.002), a self-deprecating bias was present in the sample.

Respondents' mean estimate of their driving safety when not fatigued compared to their average peer was 3.57 (s.d.=.87) on the same scale. Because this score was significantly higher than 3 (the same as average; $t_{.05,\ 253}$ = 9.07, p<.001), a self-enhancing bias was present in the sample.

There was a significant difference between relative ratings of driving safety when not fatigued compared to driving safety when fatigued ($t_{.05,\ 252}$=10.114, p<.001), with a mean difference between the relative ratings of .75 (s.d.=1.17).

Respondents' mean estimate of their driving skill when fatigued compared to their average peer was 2.83 (s.d.=.86) on the same scale. Because this score was significantly lower than 3 (the same as average; ($t_{.05,\ 250}$ =-3.15, p=.002), a self-deprecating bias was present in the sample.

Respondents' mean estimate of their driving skill when not fatigued compared to their average peer was 3.62 (s.d.=.87) on the same scale. Because this score was significantly higher than 3 (the same as average; $t_{.05,\ 251}$ =11.17, p<.001), a self-enhancing bias was present in the sample.

There was a significant difference between relative ratings of driving skill when not fatigued compared to driving skill when fatigued ($t_{.05,\ 250}$=11.09, p<.001), with a mean difference between the relative ratings of.78 (s.d.=1.12).

Respondents' mean estimate of their driving experience compared to their average peer was 3.41 (s.d.=.99) on the same scale. Because this score was significantly higher than 3 (the same as average; $t_{.05,\ 251} = 6.57$, $p<.001$), a self-enhancing bias was present in the sample.

23-25 year olds estimated there relative chance of having a crash while fatigued lower than did 20-22 year olds ($t_{.05,\ 242}=2.23$, p=.027; 1.99 vs. 2.28). Urban drivers estimated their relative driving safety when fatigued higher than did rural drivers ($F_{.05,\ 1,\ 250}=6.58$, p=.011; 2.93 vs. 2.65). Thus, 23-25 year olds and urban drivers demonstrated a weaker self-deprecating bias regarding the likelihood of crashing when fatigued. No further significant difference in responses to these questions was observed by age group (all p's > .075), gender (all p's>.05), or region (all p's >.084).

For the difference between relative ratings of crash likelihood (while fatigued versus not fatigued), 20-22 year olds showed closer ratings than did 23-25 year olds ($t_{.05,\ 241}=2.75$, p=.006; -.79 vs. -1.22). No further significant difference was observed by age, gender, or region (all p's >.21). Age, gender, and region demonstrated no significant association with the difference between relative ratings of driving safety (while fatigued versus not fatigued; all p's >.10) or the difference between relative ratings of driving skill (while fatigued versus not fatigued; all p's >.09). Thus, 20-22 year olds demonstrated less impact of fatigue on relative crash likelihood (compared to 23-25 year olds).

In summary, the typical self-enhancing biases are observed for situations not involving fatigue, but for the same situations involving fatigue self-deprecating bias was observed. In the context of fatigue also being seen to worsen each situation, this pattern may reflect a tendency to view oneself as "more extreme than average". However, this pattern may also reflect a response bias introduced by always asking about the situation involving fatigue immediately after asking about the situation not involving fatigue. Respondents may have adjusted their responses to show an awareness of the impact of fatigue without appreciating the logic of the comparative judgement. If the risks posed by driving whilst fatigued really were personalised (if the results are genuine), then the observed rate of using inappropriate techniques to continue driving, and the reported rates of driving whilst fatigued are surprising high (see section Frequency of driving whilst fatigued, and associated factors").

Techniques used to avoid driving whilst fatigued

Figure 5 presents the percentage of respondents who reported the use of each of 11 offered techniques for keeping “alert whilst driving”.

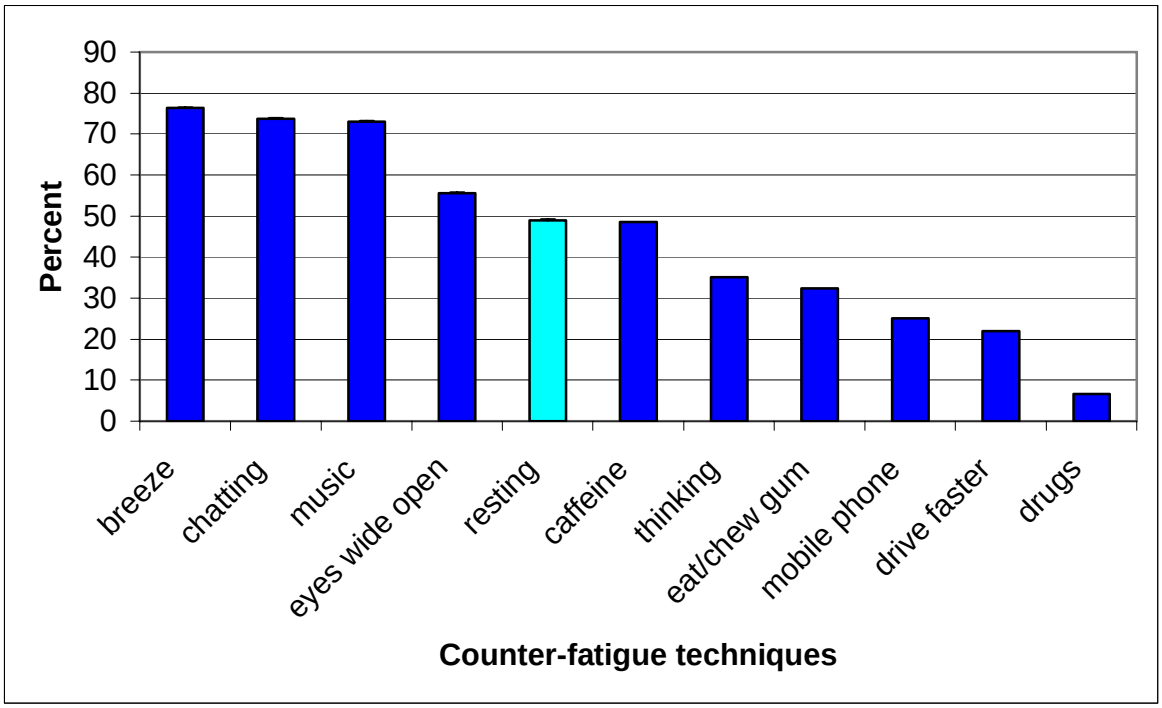


Figure 5: Percentage of respondents who reported the use of each of 11 offered techniques for keeping “alert whilst driving”.

6 people (2.3%) reported using alternative methods e.g. moving around, acupressure etc.

Observed rates are substantially higher than those observed in the 2003 Community Attitude Survey (Pennay, 2004; 2% each for breeze, music, and caffeine) in response to the question “What should drivers do if they experience fatigue or tiredness whilst they are out driving?”. Clearly, the question of what drivers *should* do may incorporate perceived efficacy of these techniques, as well as social norms. Our results indicate that many people do what they think they shouldn’t.

Thus, of the 10 offered inappropriate techniques, 9 were performed by 20% of respondents, and 4 (winding the window down to feel a breeze, chatting with passengers, turning up the music or singing, and trying to keep eyes wide open) were performed by a greater percentage of respondents than was the appropriate counter-fatigue technique of resting. Using caffeine was employed almost as often as resting.

20-22 year olds were more likely than 17-19 year olds to report caffeine use (Z=-2.254, p=.024; 53.5% vs. 35.9%), and less likely than 23-25 year olds to report stopping and resting (Z=-2.96, p=.003; 44.8% vs. 67.5% vs.). Females were less likely than males to report stopping and resting (Z=-2.305, p=.021; 42.6% vs. 57.1%). No further significant difference in technique use was observed by age (all p’s > .08), gender (all p’s > .06), or region (all p’s >.06).

Figure 6 depicts, for each of the offered techniques, the percentage of respondents judging the technique to lower crash risk (-1), to have no effect on crash risk (0), or to increase crash risk (1).

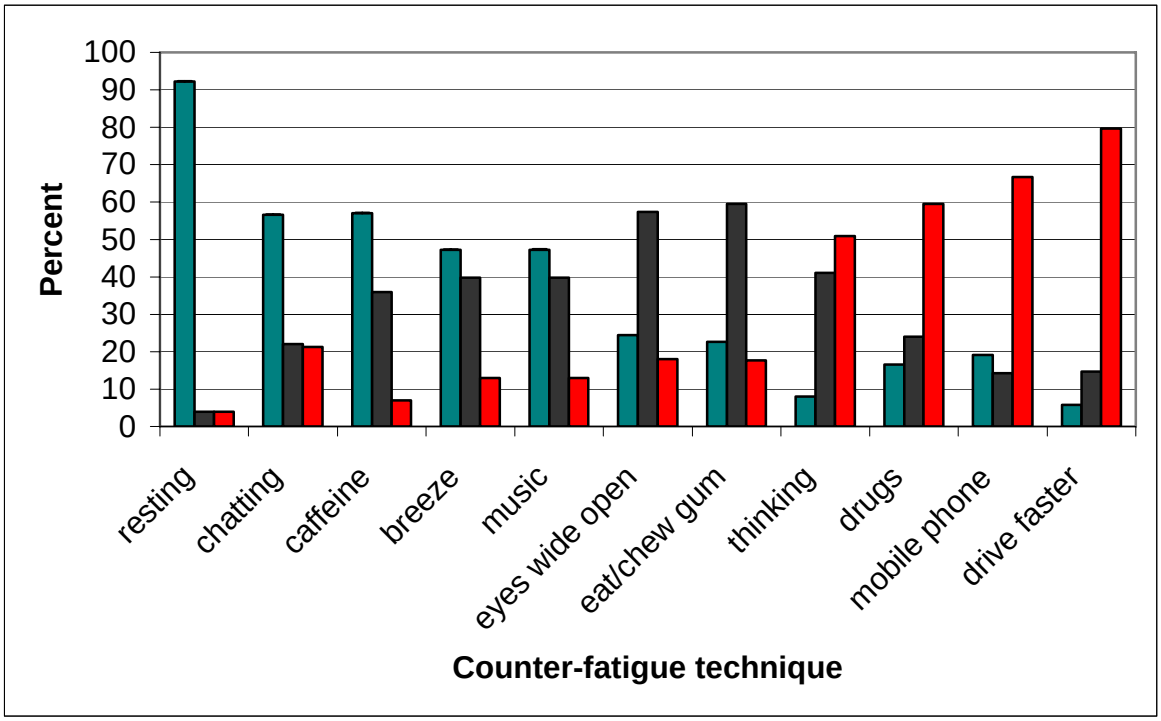


Figure 6: Percentage of respondents judging each of 11 offered techniques for keeping "alert whilst driving" to lower crash risk (green), to have no effect on crash risk (black), or to increase crash risk (red).

Thus, resting is clearly recognised to be an effective counter-fatigue technique by the vast majority of respondents. "Decreases risk" was also the modal response for chatting with passengers, using caffeine, winding the window down to feel a breeze, and turning up the music or singing. Although over 50% of respondents report doing it, "trying to keep eyes wide open" is recognised to have no impact on crash-risk by a similarly large percentage of respondents. Several counter-fatigue measures were believed to increase crash risk by the larger proportion of respondents (especially using stimulants, talking on the mobile phone, or driving faster).

20-22 year olds judged that using drugs increased crash risk of driving whilst fatigued to a significantly lower extent than did 23-25 year olds ($t_{.05,\ 192}$=2.70, p=.008; .58 vs. .23). Males judged that driving faster increased crash risk of driving whilst fatigued to a significantly lower extent than did females ($F_{.05,\ 1,\ 223}$=7.13, p=.008; .63 vs. .82). Males judged that using caffeine decreased crash risk of driving whilst fatigued to a significantly higher extent than did females ($F_{.05,\ 1,\ 226}$=4.81, p=.029; -.60 vs. -.41). There was no further observed significant effect of age (all p's > .13), gender (all p's> .08), or region (all p's >.22).

Figure 7 presents the percentage of respondents who reported having performed each of 4 offered behaviours in order to avoid driving when they felt fatigued.

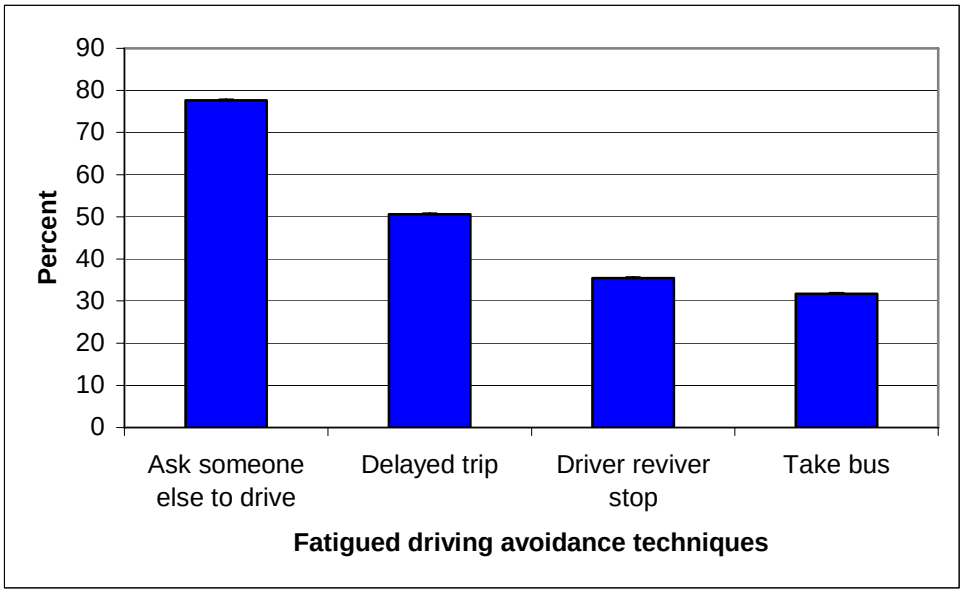


Figure 7: Percentage of respondents who reported having performed each of 4 offered behaviours in order to avoid driving when they felt fatigued.

Respondents did not identify any other behaviours that they had performed in order to avoid driving when they felt fatigued.

Thus, results suggest some use of appropriate behaviours to avoid driving whilst fatigued, although the percentage of respondents who reported employing these behaviours was lower than the percentage of respondents who reported employing many of the inappropriate counter-fatigue techniques.

17-19 year olds were less likely than were 20-22 year old drivers to report stopping at a driver reviver station (Z=-2.40, p=.016; 23.1% vs. 40.7%). No further significant differences in responses to these questions were observed by age (all p's > .13), gender (all p's >.073), or region (all p's >.11).

In summary, results indicate extensive use of inappropriate techniques to continue driving whilst fatigued, although only four of these are believed to effectively reduce fatigue-related crash risk: chatting with passengers, using caffeine, winding the window down to feel a breeze, and turning up the music or singing. The appropriate technique of resting is more commonly regarded as effective, but no more commonly performed. Several techniques for avoiding driving whilst fatigued in the first place have been employed by at least 30% of respondents- albeit a lower proportion than have employed many of the inappropriate counter-fatigue techniques.

Beliefs regarding relevance of driving whilst fatigued to certain drivers

Figure 8 presents the percentage of respondents reporting that driver fatigue mainly affects one of 4 offered types of driver, or that "driver fatigue can affect anyone".

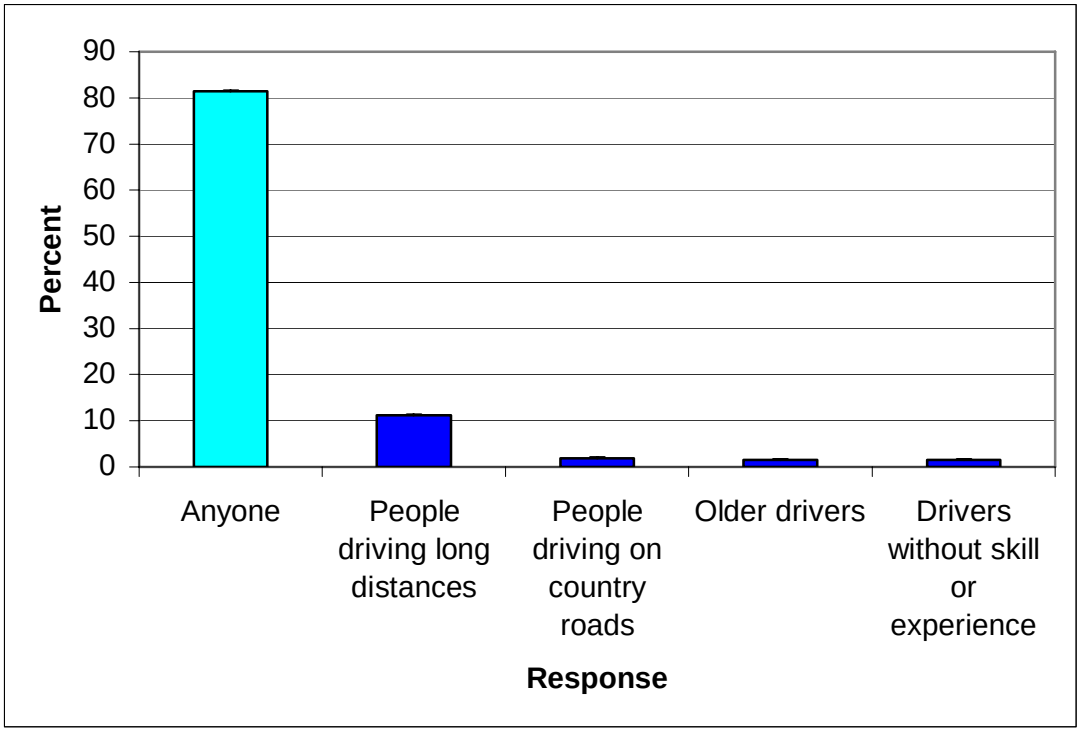


Figure 8: Percentage of respondents reporting that driver fatigue mainly affects one of 4 offered types of driver, or that "driver fatigue can affect anyone".

Urban drivers were less likely than rural drivers to report that "driver fatigue can affect anyone" (Z=-2.50, p=.013; 79.1% vs. 91.0%). No significant difference in responses to this question were observed by age (all p's >.747) or gender (p=.98).

Thus, the greater percentage of respondents recognised that fatigue can affect anyone. Nonetheless, the belief that fatigue mainly affects people driving long distances was endorsed by just over 10% of the sample.

Ability to drive without becoming fatigued

Respondents' mean estimate of the amount of time that they could drive without feeling fatigued was 3.86 hours (s.d.=2.73), whereas the corresponding estimate for their average peer was 3.40 hours on average (s.d.=1.90). These scores were significantly different ($t_{.05, 250}$=3.92, p<.001), indicating the presence of self-enhancing bias in the sample.

20-22 year olds estimated a significantly longer driving period for themselves than did 17-19 years ($t_{.05, 1, 244}$=-2.75, p=.006; 4.36 hours vs. 3.20 hours). 20-22 year olds also demonstrated a significantly greater difference in their estimates of time for themselves versus peers than did 17-19 year olds ($t_{.05, 250}$=-3.04, p=.003; .88 vs. -.020). Males estimated a significantly longer driving period for themselves than did females ($F_{.05, 1, 252}$ = 14.02, p=0; 4.74 hours vs. 3.31 hours). Males also demonstrated a significantly greater difference in their estimates of time for themselves versus peers than did females ($F_{.05, 1, 248}$=7.30, p=.007; =.91 hours vs. -.19hours). No further significant difference was observed by age (all p's > .29) or region (all p's >.85).

Respondents' mean estimate of their chances of becoming fatigued while driving short distances compared to their average peer was 2.27 (s.d.=.91) on a scale from 1 (much lower than average) to 5 (much higher than average). Because this score was significantly lower than 3 (the same as average; $t_{.05, 251}$ =-12.77, p<.001), an optimistic bias was present in the sample.

In contrast, respondents' mean estimate of their chances of becoming fatigued while driving long distances compared to their average peer was 3.27 (s.d.=.91) on the same scale. Because this score was significantly higher than 3 (the same as average; $t_{.05, 241}$ =2.12, p=.035), a pessimistic bias was present in the sample. This result, taken with the earlier findings for relative crash risks, suggests that fatigue is seen to be more involved in long than short drives (either producing "more extreme than average" reasoning, or adjustment of responses to indicate an awareness of the impact of fatigue, as discussed earlier).

20-22 year olds estimated their relative chance of becoming fatigued while driving long distances lower than did 17-19 year olds ($t_{.05, 241}$ =2.12, p=.035; 3.14 vs. 3.45). No further significant differences in responses to these questions was observed by age (all p's > .075), gender (all p's>.05), or region (all p's >.084).

In summary, results suggest a belief that driver fatigue is most likely to be a problem on longer drives, and indicate a self-enhancing bias regarding the ability to drive without becoming fatigued. Estimates of driving time before fatigue sets in are somewhat longer than, but close to, the much-advertised "2 hours". Self-enhancing bias was evident for these estimates as well as the chance of becoming fatigued for "short drives" (suggesting fatigue is not seen to be involved in short drives). The finding of a self-deprecating bias for "long drives" suggests that fatigue is seen to be involved in these drives (given the earlier findings regarding relative crash risks).

Normative attitudes toward driving whilst fatigued

Figure 9 presents the percentage of respondents describing a young driver knowingly driving 1) whilst fatigued; 2) over the legal BAC (.07); and 3) at a speed of 80km/hr in a 60km/hr zone, as either sensible, just doing what everyone else does, a little bit silly, stupid, irresponsible, criminal, a potential murderer.

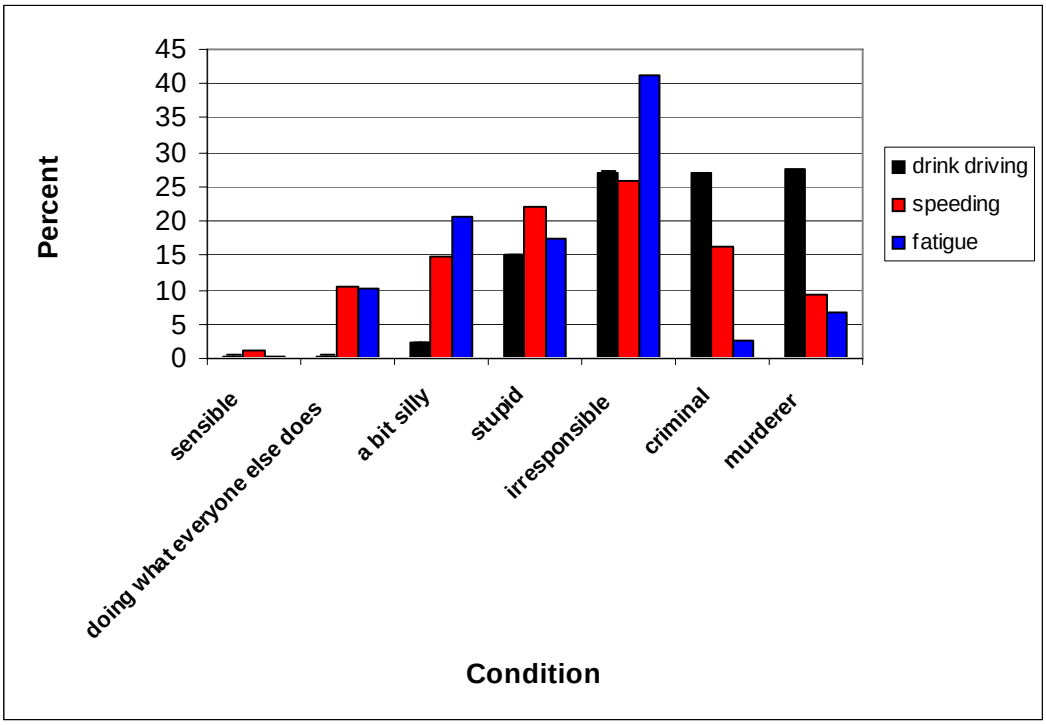


Figure 9: Percentage of respondents describing a young driver knowingly driving 1) whilst fatigued (blue); 2) over the legal BAC (black); and 3) at a speed of 80km/hr in a 60km/hr zone (red), as either of 7 offered descriptions.

Thus, "irresponsible" is the modal description of a fatigued young driver, as well as a speeding young driver. For a speeding young driver, over 25% of respondents used one of the last two descriptors. For a drink-driving young driver, over 50% of respondents used one of the last two descriptors. For a fatigued young driver, just over 10% of respondents used the last two descriptors. It is interesting to note that this ordering of these 3 risky behaviours matches the ordering of contribution to road trauma (top 3 contributors only; speeding was the most frequently named first).

Respondents were significantly more lenient in their descriptions of the young fatigued driver, than of the young drink driver ($F_{.05,\ 1,\ 257}$=208.19, p<.001; 4.21 vs. 5.60) or the young speeding driver ($F_{.05,\ 1,\ 257}$=6.95, p=.009; 4.21 vs. 4.47).

20-22 year olds were significantly more lenient than were 23-25 year olds in their descriptions of the fatigued young driver ($F_{.05,\ 1,\ 247}$=-3.37, p=.001; 3.94 vs. 4.63). 20-22 year olds were also significantly more lenient in their descriptions of the young drink driver than were either 17-19 year olds ($F_{.05,\ 1,\ 247}$ = 2.374, p=.018; 5.30 vs. 5.73) or 23-25 year

olds ($F_{.05, 1, 247}$ = 2.37, p=.005; 5.30 vs. 5.80). Males were significantly more lenient than females in their descriptions of the young speeding driver ($F_{.05, 1, 254}$ = 4.04, p=.045; 4.28 vs. 4.64). There were no further significant differences in responses to this question by age (all p's >.068), gender (all p's >.101), or region (all p's>.189).

Figure 10 presents the percentage of respondents reporting that each of 6 offered types of penalty would be deserved for driving whilst fatigued.

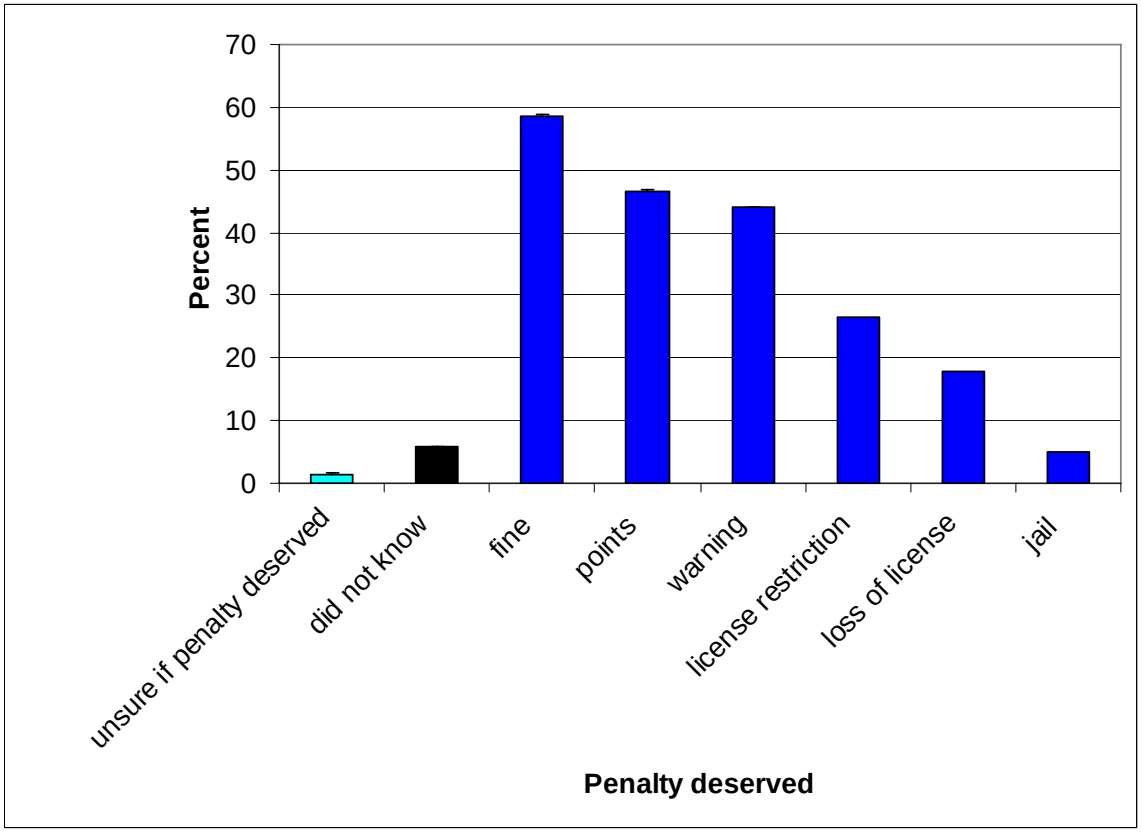


Figure 10: Percentage of respondents reporting that each of 6 offered types of penalty would be deserved for driving whilst fatigued.

17-19 year olds were more likely than 20-22 year olds to report that loss of license should be incurred for fatigued driving (Z=-2.17, p=.03; 26.4% vs. 12.5%). Females were more likely than males to report that license restriction should be incurred for fatigued driving (Z=-2.45, p=.014; 36.4% vs. 21.6%). No further significant differences were observed for any of the penalties by age, gender, or region (all p's >.06).

Amongst those who reported that a fine is deserved for driving whilst fatigued, the average suggestion for the fine was $301 (range: $0 - $5,000). Amongst those who reported believing that demerit points are deserved, the average suggestion for the demerit points was 2 (range: 1 – 6 points). Amongst those who reported restriction of license is deserved, the average suggestion for the period of license restriction was 8 days (range: 1 – 180 days). Amongst those who reported loss of license is deserved, the average suggestion for the period of license suspension was 11 days (range: 1 – 180 days). Amongst those who reported a jail term is deserved, the average suggestion for the period of incarceration was

4 days (range: 1 – 12 days). No significant difference in proposed magnitude of penalties was observed by age group, gender or region (all p's >.07).

In summary, these results indicate that there is some social censure of driving whilst fatigued, with a modal description of a young fatigued driver as "irresponsible" and support for various penalties for driving whilst fatigued. The finding that only around 10% of respondents used one of the worst two descriptors ("criminal", "potential murderer") for a fatigued young driver, compared to over 50% for drink-driving and over 25% for speeding, taken together with earlier findings of crash risk for these behaviours, suggests that social censure of driving whilst fatigued could be strengthened. Further, these results suggest that perceived crash risk and social censure may be related.

Experience of symptoms of fatigue

Figure 11 presents the percentage of respondents reporting that they had experienced each of 10 offered symptoms of driver fatigue.

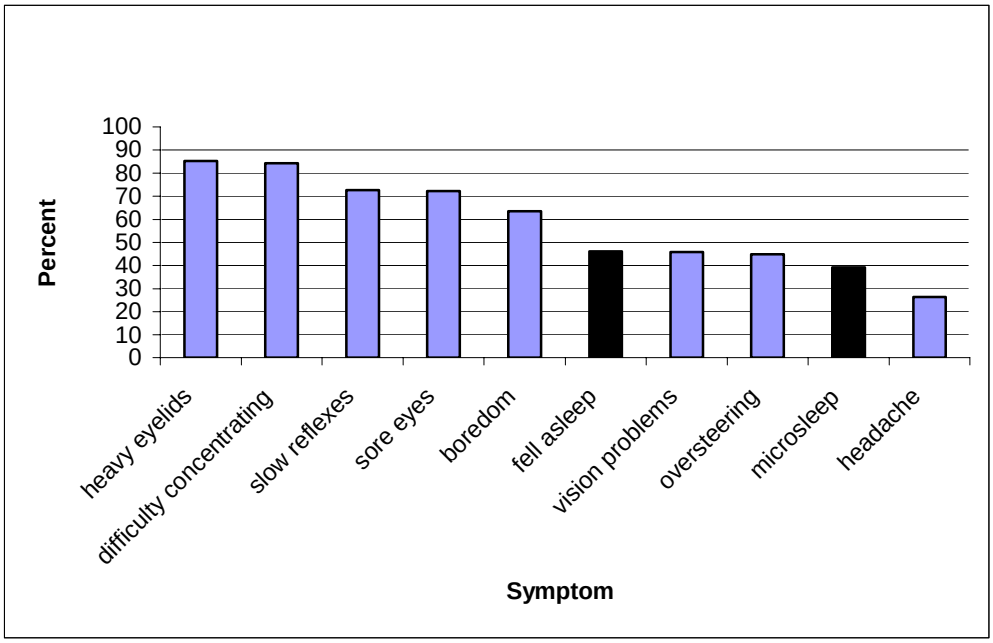


Figure 11: Percentage of respondents reporting that they had experienced each of 10 offered symptoms of driver fatigue.

In addition, one respondent reported having felt restless as a symptom of driver fatigue. Another respondent reported having experienced an additional symptom without specifying the symptom.

20-22 year olds were less likely than 17-19 year olds to report having experienced sore eyes (Z=-2.09, p=.037; 63.9% vs. 78.9%), and less likely than 23-25 year olds to report having experienced difficulty concentrating (Z=-2.19, p=.028; 77.4% vs. 89.3%) or oversteering (Z=-1.995, p=.046; 40.0% vs. 55.4%). Males were less likely than females to report having experienced sore eyes (Z=-3.01, p=.003; 63.5% vs. 80.1%), heavy eyelids (Z=-2.31, p=.021; 79.5% vs. 89.9%) and vision problems (Z=-2.77, p=.006; 36.5% vs.

54.1%). Urban respondents were less likely than rural respondents to report having experienced difficulty concentrating (Z=-2.80, p=.005; 80.2% vs. 92.9% vs.), boredom (Z=-2.90, p=.004; 57.1% vs. 75.9% vs.) and oversteering (Z=-2.59, p=.010; 39.3% vs. 56.5%). No further significant difference in response to these questions was observed by age (all p's>.068), gender (all p's >.164), or region (all p's>.135).

Thus, reported experience of various symptoms of driver fatigue was high, hinting at a relatively high frequency of driving whilst fatigued. The pattern of age and gender differences, in conjunction with age and gender differences in other variables, suggests that less frequent reporting of a symptom may reflect less frequent recognition of that symptom rather than less frequent experience of it. For example, 20-22 year olds were less likely than other age groups to report several symptoms, but otherwise show a profile consistent with more frequent driving whilst fatigued (e.g. more likely to know that there are no penalties, more likely to use caffeine, less likely to stop and rest, more lenient in their description of a fatigued young driver, able to drive for longer before becoming fatigued, and more likely to have had a fatigue-related crash).

Frequency of driving whilst fatigued, & associated factors

Respondents rated frequency of driving whilst fatigued for themselves, for the "average driver", and for their average peer. The percentage of respondents providing each response is shown in Figure 12.

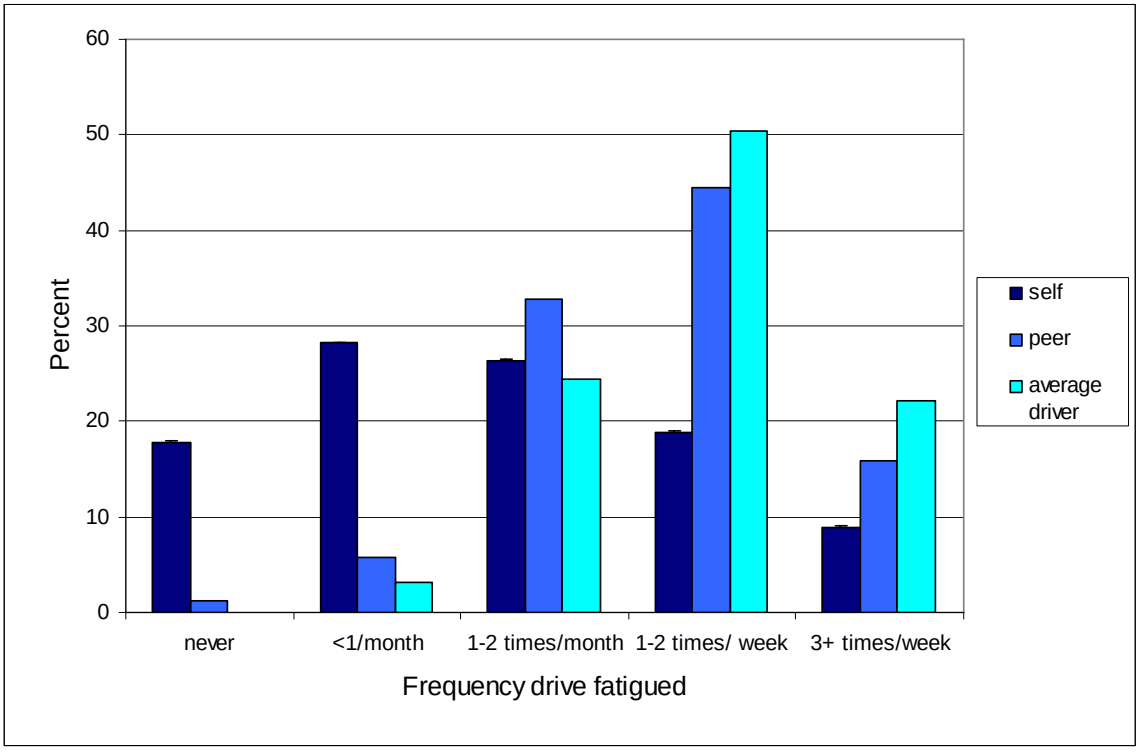


Figure 12: Percentage of respondents providing each response for frequency of driving whilst fatigued for themselves, for the "average driver", and for their average peer.

Thus, over 80% of respondents report driving whilst fatigued at least sometimes, and over 25% report doing it at least once per week.
Respondents' mean response for themselves (M=1.7, s.d.= 1.21) lay between "less than once a month" and "once or twice a month". The mean rating for the average driver (M=2.9, s.d.= .76) and for the average peer (M=2.69, s.d.= .85) lay between "once or twice a week" and "once or twice a month". No significant difference in responses to these questions were observed by age, gender, or region (all p's >.13).

Higher self-reported frequency of driving whilst fatigued was significantly associated with higher self-reported education level (r=.143, p=.002), higher number of years licensed (r=.110, p=.092), more hours per week spent driving (r=.209, p=.001), lower estimated percent of crashes cause by fatigue (r=-.138, p=.027), higher relative driving safety when fatigued (r=.169, p=.007), higher relative driving experience (r=.189, p=.003), and belief that fatigue-related crash risks are reduced by taking drugs (r=-.139, p=.049), ignoring it (r=-.176, p=.008), using a mobile (r=-.161, p=.017) or eating gum or food (r=-.223, p<.001). Further, self-reported frequency of driving whilst fatigued was significantly higher amongst those who use music ($F_{.05, 1, 253}$=15.04, p<.001; M=1.90 vs. M=1.24), those who use eating/chewing gum ($F_{.05, 1, 250}$=4.72, p=.031; M=1.95 vs. M=1.60), those who use driving faster ($F_{.05, 1, 258}$=10.52, p=.001; M=2.18 vs. M=1.59) those who use chatting ($F_{.05, 1, 252}$=7.45, p=.006; M=1.84 vs. M=1.37), those who use mobile phone ($F_{.05, 1, 246}$=7.83, p=.006; M=2.08 vs. M=1.59), those who use caffeine ($F_{.05, 1, 253}$=5.26, p=.023; M=1.90 vs. M=1.55), those who try to ignore it and think of other things ($F_{.05, 1, 258}$=6.118, p=.014; M=1.98 vs. M=1.59), and those who use keeping eyes wide open ($F_{.05, 1, 259}$=11.73, p=.001; M=1.94 vs. M=1.42). Those who believe that anyone can be affected by fatigue reported that they drive fatigued more frequently than those who gave alternative responses ($t_{.05, 248}$=-2.37, p=.018; M=1.8 vs. M=1.3). Self-reported frequency of driving whilst fatigued was significantly lower amongst those who supported demerit points ($F_{.05, 1, 233}$=5.22, p=.023; 1.55 vs. 1.90), jail time ($F_{.05, 1, 230}$=7.28, p=.008;.85 vs. 1.77), license loss ($F_{.05, 1, 232}$=7.36, p=.007; 1.28 vs. 1.82), or license restriction ($F_{.05, 1, 230}$=5.48, p=.020; 1.84 vs. 1.44).

Self-reported frequency of driving whilst fatigued demonstrated no significant association with the belief that no penalties exist for driving whilst fatigued (p=.60), the belief that police can detect driver fatigue in the respondents (p=.29), perceived impact of fatigue on crash likelihood (.06), all remaining relative ratings (being pulled over, crashing, and driving skill *when fatigued*; p's >.07), the difference between relative ratings when fatigued vs. not fatigued for crashing, driving safety and driving skill (all p's >.36), employing stopping and resting, drugs, or "breeze' to combat fatigue (although for breeze p=.054, with those who use the technique slightly more likely to drive fatigued, all other p's >.45), the extent to which fatigue-related crash risks are reduced by breeze, music, driving faster, chatting, stopping and rest, caffeine, and keeping eyes wide open (all p's >.08), use of effective fatigue avoidance measures (i.e. take a bus, ask a friend to drive, stop at a driver reviver station, or delay the trip; all p's>.48), the belief that driver fatigue mainly affects people driving long distances (p=.56), the description of a young fatigued driver (p=.15), support for a fine, support for a warning, or belief that no penalty is deserved (all p's >.30), or exposure to counter-fatigue messages in any media (all p's >.24).

Thus, in order to reduce driving whilst fatigued it appears particularly important to target perceived driving safety whilst fatigued, the use and perceived efficacy of inappropriate techniques to combat fatigue, as well as social norms.

Experience of fatigue-related incidents whilst driving, & associated factors

5% of the sample reported having had a crash due to driving while fatigued, while 29% reported almost having had a crash due to driving while fatigued. 20-22 year olds were more likely to report crash experience (crash or near crash) than 17-19 year olds ($t_{.05, 247}$=-2.20, p=.028; 39.1% vs. 23.1%). Self-reported experience of a fatigue-related incident demonstrated no further difference by age (p=.18), gender (p=.084), or region (all p's >.18).

Respondents who reported having had a crash or a near crash, reported which of 7 offered factors contributed to their feeling fatigued when the incident occurred. Figure 13 presents the percentage of these respondents who endorsed each factor.

Figure 13: Percentage of respondents who have had a fatigue-related crash or near-crash who endorsed each of 7 offered factors as having contributed to their feeling fatigued when the incident occurred.

In addition, one respondent mentioned children keeping them awake at night, and another mentioned boredom.

Males were more likely than females to report clubbing (Z=-2.20, p=.028; 47.5% vs. 22.9%) or socialising (Z=-2.11, p=.035; 59.0% vs. 34.3%) as a contributor to the fatigue that caused an incident. In contrast, females were more likely than males to cite studying (Z=-2.06, p=.039; 42.9% vs. 20.5%), or to mention "nothing in particular" (Z=-2.08, p=.037; 20.0% vs. 3.1%). Rural respondents were more likely than urban respondents to report clubbing (Z=-2.20, p=.028; 53.8% vs. 28.0%), socialising (Z= -2.60, p=.009; 68.0% vs.

36.0%), or “nothing in particular” (Z=-2.64, p=.008; 27.8% vs. 4.4%) as a contributor to the fatigue that caused an incident. No further significant difference in these responses was observed by age, gender, or region (all p’s >.07).

Whilst there is some recognition of factors besides driving contributing to driver fatigue, socialising, partying and studying were recognised by less than 15% of respondents.

Those who self-reported the experience of a fatigue-related incident (crash or near crash) reported driving significantly more hours per week ($F_{.05, 1, 253}$=11.79, p=.001; M=15.82 vs. M=10.32). Further, those who self-reported the experience of a fatigue-related incident (crash or near crash) were significantly less likely to wind a window down to feel a breeze (Z=-2.03, p=.042; 74.2% vs. 85.7%), use music (Z=-3.03, p=.002; 68.9% vs. 87.0%), chew gum or eat (Z=-2.60, p=.009; 28.4% vs. 45.3%), talk on their mobile (Z=-2.87, p=.004; 21.1% vs. 38.9%), use caffeine (Z=-2.54, p=.011; 44.4% vs. 61.8%) or keep their eyes wide open (Z=-2.34, p=.019; 52.8% vs. 68.9%) to combat fatigue.

Self-reported experience of a fatigue-related incident (crash or near crash) was not significantly associated with self-reported education level attained or years licensed by crash experience (all p’s >.33), belief that no penalties exist for driving whilst fatigued (p=.170), belief that police can detect fatigue in the respondents (p=.964), estimated percent of crashes cause by fatigue (p=.546), perceived impact of fatigue on crash likelihood (p=.513), any relative ratings (being pulled over, crashing, driving safety, and driving skill *when fatigued*, or experience; p’s >.114), difference between relative ratings when fatigued vs. not fatigued for crashing, driving safety and driving skill (all p’s >.480), use of stopping and resting, chatting, ignoring it, driving faster or using drugs to combat fatigue (all p’s >.073), extent to which fatigue-related crash risks are reduced by all inappropriate techniques (all p’s<.077), use of appropriate avoidance techniques (all p’s >.30), description of a young fatigued driver (p=.331), support for a fine, support for a warning, or belief that no penalty is deserved (all p’s >.101).

The observed relationships with use of inappropriate techniques to combat fatigue are likely to be result of experiencing a fatigue-related incident. That is, drivers who have been involved in a fatigue-related incident may be more careful not to drive when fatigued.

Media in which messages regarding driving whilst fatigued have been seen

Figure 14 presents the percentage of respondents who indicated that they had been exposed to messages about driver fatigue via each of 9 forms of media.

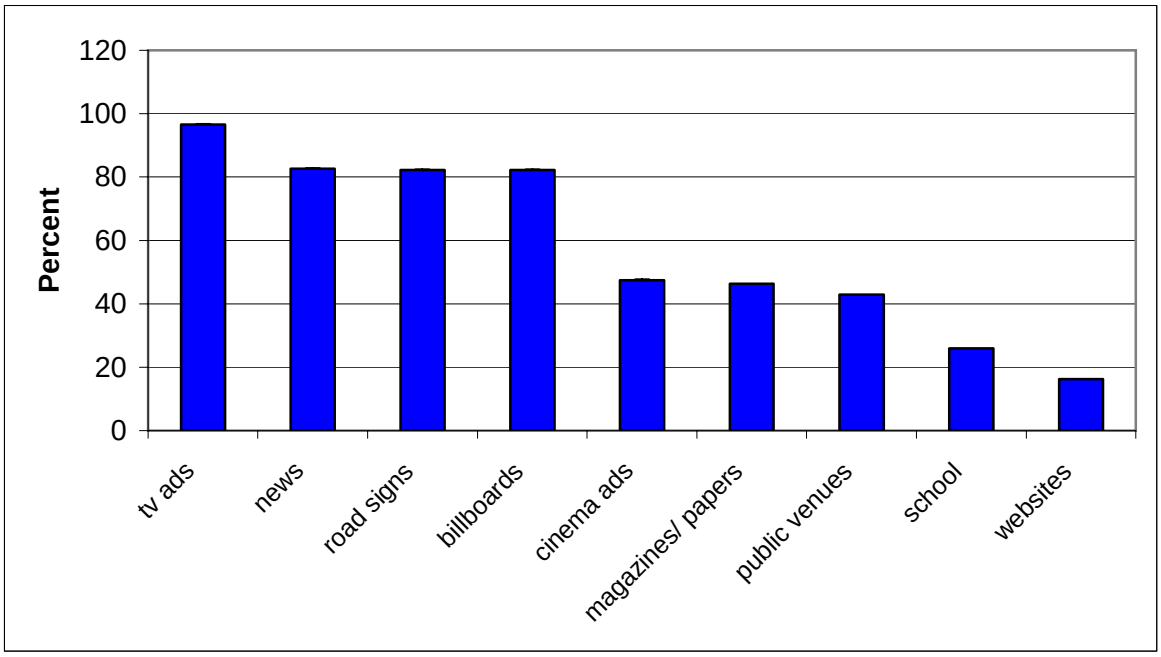


Figure 14: Percentage of respondents who indicated that they had been exposed to messages about driver fatigue via each of 9 forms of media.

17-19 year olds were more likely than 20-22 year olds to report being exposed to counter-fatigue messages in school programs (Z=-3.15, p=.002; 35.9% vs. 20.0%). 20-22 year olds less likely than 23-25 year olds to report being exposed to counter-fatigue messages in public venues (Z=-2.069, p=.039; 37.6% vs. 53.8%). Rural respondents were more likely than urban respondents to report being exposed to counter-fatigue messages on the news (Z=-2.03, p=.04; 90.7% vs. 80.8%). Compared to males, females were more likely to report being exposed to counter-fatigue messages in school programs (Z=-2.65, p=.008; 35.0% vs. 17.1%), but less likely to report being exposed to such messages in public venues (Z=-3.15, p=.002; 37.2% vs. 54.0%). No further significant differences in responses to this question were observed by age (all p's >.14), gender (all p's >.19), or region (all p's >.22).

Implications of findings for anti-fatigue message to be evaluated in Study 2

Content and presentation of anti-fatigue message

Several aspects of the results suggest that perceived risk of penalty is unlikely to be a strong deterrent to driving whilst fatigued amongst young people. Around 35% of respondents believed that there are no penalties for fatigue. Around 75% did not believe that police could detect a fatigued driver, suggesting low perceived efficacy for various methods of detection that a relatively large proportion of the sample believed are currently being used. Further, respondents demonstrated optimism bias regarding their chances of being pulled over for negligent driving due to fatigue. There may be scope to utilise perceived risk of penalty in anti-fatigue messages, given that some respondents believed that there are penalties for fatigue, felt that police could detect a fatigued driver, and/or identified methods of detection. However, because there are currently no penalties or detection methods, and because we wanted to base our anti-fatigue message in fact, penalties and detection were not a component of the anti-fatigue message developed for the present research.

The anti-fatigue messages developed for the present research program provide risk information in order to build on and extend the recognition of crash risks associated with fatigue that was observed in Study 1. Direct assessment of the extent to which fatigue is perceived to increase crash risk suggested scope for improvement. All messages identify that “like drink driving” fatigue impairs driving skills and ability, so increasing the chances of a crash. Drink-driving is used as an anchor because it was recognised as a more frequent and familiar contributor to crashes than fatigue in Study 1. All messages also provide statistics regarding the likelihood of a young driver (17 – 25 years old) being the driver in a fatigue-related crash, with a graphical representation of these statistics [see Figure 15]. Two versions of the message also included a “Risk ladder” (specifically designed for Study 2) in order to facilitate interpretation of risk information [see Figure 16].

The information was presented so as to personalise risks. Although Study 1 results suggested pessimism bias, rather than optimism bias, regarding crash risk, driving safety and driving skill, when fatigued, this may have reflected a response bias (which is to be addressed in Study 2). Further, self-reported rates of driving whilst fatigued and of use of inappropriate techniques to combat fatigue suggests that fatigue-related crash risks are not personalised. The pamphlet was entitled “Driver fatigue and you”, and was largely phrased in the second person (e.g. “Driving when you are fatigued means that you and your passengers are more likely to be involved in a crash). Statistics were given for young drivers in particular (sometimes in comparison with older drivers), and the “Risk ladder” (included in two versions of the message) identified their consequent relevance with the statement: “The statistics shown in the diagram apply to YOU because they are based on information about 17 – 25 year olds”. Finally, the failure of driving skill to immunise against fatigue-related crash risk was emphasised in all anti-fatigue messages, and reiterated in the “Debunking common myths” Section included in some versions of the message.

Profound differences in perceptions of health risk have been found to exist depending on the way in which risk-relevant information is presented to young people (Kasparian & Job, 2002a, 2002b; Otten & van der Pligt,1996). Lipkus et al. (1999) provide an empirical basis

for several components of the anti-fatigue message that was developed for this research. First, heath-relevant interventions appear more accurate, trustworthy, and credible to receivers if they include specific information on risk factors (see also Rothman and Kiviniemi, 1999). Second, relatively simple manipulations of risk information (e.g. personalisation of information and provision of contextual cues) increase awareness of risk factors. Third, comparing the incidence of a target event (e.g. crashes due to driver fatigue) with other similar events (e.g. crashes due to speeding or drink driving) improve understanding of risk information. The use of graphical presentation tools is likely to enhance this effect.

The anti-fatigue messages emphasised that crash risks could not be reduced through using various inappropriate counter-fatigue techniques, and offered advice regarding appropriate means of minimising fatigue-related crash risk. The inappropriate counter-fatigue techniques selected for specific target in the anti-fatigue messages were those which Study 1 respondents most often reported using *and* most often identified as decreasing crash risk: getting some breeze, chatting, listening to music, and using caffeine. Further, the effectiveness of resting was emphasised in these messages. Inappropriate techniques were addressed in the "Debunking common myths' section included in some versions of the message. In addition, all messages included the statement "A lot of people use strategies to keep driving when they are tired. None work. If you are fatigued while you are driving, the only thing you can do to ensure that you don't crash is stop and rest". All messages also advocated the use of approaches to avoiding driving whilst fatigued: "share the driving", "plan your drivers", and "take a break from driving".

The anti-fatigue messages also aimed to undermine perceived immunity from crash risk on the basis of being a particular type of driver, in order to strengthen the recognition observed in Study 1 that driver fatigue "can affect anyone". All messages identified that "Driver fatigue can affect anyone, regardless of age, driving skill, or experience". In Study 1, 10% of respondents endorsed the view that driver fatigue is mainly a problem for people driving long distances, the mean estimated driving time before becoming fatigued at around 4 hours, and self-enhancing bias was observed regarding the chance of becoming fatigued on short drives. Thus, all messages identified that driver fatigue "is determined by more than just the amount of time you have been driving" and "is NOT just a problem for truck drivers". The "Debunking common myths" section that was included in some versions of the message identified that "driver fatigue is not only a problem that happens on long drives".

Further, the anti-fatigue messages aimed to improve understanding of factors that contribute to driver fatigue. The messages targeted contributors that were recognised by less than 15% of respondents in Study 1- socialising and partying (in the "Debunking common myths" section) and studying (in all messages). Although recognised by a greater percentage of respondents in Study 1, lack of sleep and work were also addressed in all messages, as was strenuous activity.

Social censure of driving whilst fatigued was not directly addressed in the anti-fatigue messages. Study 1 results suggest that some social censure already exists, but it is not as strong as for drink-driving and speeding, possibly because these behaviours are thought to contribute to more crashes. Thus, if the anti-fatigue messages increase perceived crash risk of driving whilst fatigued, they may also increase social censure of this behaviour. Social norms were also harnessed in the statements "Driving when you are fatigued

means that you and your passengers are more likely to be involved in a crash", and "You know you shouldn't let a friend drink drive, so why would you let them… drive while fatigued?" (which appeared in all messages).

Need to target specific audiences

Study 1 results suggested no need to design different messages for specific subgroups of young people, although observed relationships suggested that some groups may be *at risk*.

20-22 year olds generally demonstrated a profile consistent with more frequent driving whilst fatigued, compared to at least one other age group. 20 – 22 year olds were more likely to know that there are no penalties for driving whilst fatigued, less likely to report that police use detection techniques (reflex testing and eye exams), more likely to use caffeine and less likely to stop and rest (to combat fatigue), more lenient in their description of a fatigued young driver, less likely to report (or recognise) several symptoms of fatigue, and more likely to have had a fatigue-related crash. In addition, they judged that stimulant use (to combat fatigue) increased crash risk to a lesser extent, estimated a longer driving time before feeling fatigued, and demonstrated a stronger self-enhancing bias regarding this driving time. They demonstrated a weaker self-deprecating bias regarding the likelihood of becoming fatigued on long drives.

Compared to females, males were more likely to know that there are no penalties, more likely to report that police use no detection techniques and less likely to report that police use eye exams, and less likely to report (or perhaps recognise) several symptoms of fatigue. In addition, they judged that using caffeine decreased fatigue-related crash risk to a greater extent, that driving faster (to combat fatigue) increased crash risk to a lesser extent, and estimated a longer driving time before feeling fatigued. However, females were less likely to stop and rest (possibly because of associated dangers).

Because age and gender were not significantly associated in our sample, these patterns are unlikely to be confounded.

Beliefs, attitudes, and behaviours relating to driving whilst fatigued demonstrated *very* few further associations with age, gender, and region (and most of our sample was English-speaking).

Thus, the anti-fatigue messages were designed to be appropriate for 20 – 22 year olds, and males, but it did not appear necessary to modify these for use with females, and other age groups.

Concerns with self-report

Because our research investigated beliefs and attitudes, it necessarily employed self-report. Further, although objective measures of behaviour are possible, self-reported measures are far more efficient and convenient. Nonetheless, the use of self-report is always accompanied by concerns regarding the accuracy of recall, and reporting. Very few questions placed substantial demand on respondents' memories. The questions regarding their experience of fatigue-related crashes or near-crashes as a driver, required only that they remembered the period of their licensure (an average of only 4.5 years in our

sample). Concerns regarding socially desirable responding are perhaps more valid, although, again, only in relation to some questions (mostly regarding behaviour). However, such concerns are allayed considerably by relatively high rates of reported “undesirable” behaviours (such as use of inappropriate counter-fatigue techniques, and driving whilst fatigued). Although we had initially planned to include the Balanced Inventory of Desirable Responding (BIDR; Paulus, 1984) to measure the tendency to respond in a socially desirably fashion, this questionnaire was omitted in order to reduce the length of the questionnaire (to maximise response rate). Further, such questionnaires are of limited use. For example, a significant relationship between scores on the BIDR and self-reported may indicate that responses are biased by the tendency to respond in a socially desirable fashion, *or it may indicate that this tendency in fact influences real behaviour (so that responses are not inaccurate)*. The absence of a significant relationship may reflect accurate responding, or insufficient statistical power.

Summary

Study 1 results appear to offer a sound and useful basis for the development of anti-fatigue messages. On the basis of these results we have developed a set of anti-fatigue messages that will be evaluated in Study 2.

Study 2

Methods

Design

Participants were randomly allocated to one of 5 groups.

Group E (control group) participants received no "anti-fatigued-driving" message before completing questionnaires.

All other participants (Groups A-D, the "message" groups) received "Basic information" designed to mimic the information available in the better approaches to reducing fatigued driving (e.g. from the RTA website), but to make this information more specific to young drivers. The "Basic information" (described in detail in the "Materials" section) included statistical risk information regarding crashes attributed to the fatigue of a young driver, as well as behavioural recommendations.

About one quarter of "message" participants (Group A) received no further information. Group B (also about one quarter of "message" participants) were given a "Risk ladder" designed to provide a context to aid interpretation of the risk information, and so to enhance the motivating effects of this information. Group C (again about one quarter of "message" participants) were given material to dispute common myths about avoiding driver fatigue, again to increase the perceived risk posed by this behaviour (and so to increase motivation to avoid it via appropriate means). Group D (the remaining "message" group participants) received *both* the information given to Group B as well as the information given to Group C.

Table 9 summarises the content of the material given to Groups A-E. A detailed explication of the contents of each message component is provided in the "Materials" section.

Table 9: Content of material given to Groups A-E

	Message Component			
Group	*Basic information Part1*	*Risk Ladder*	*Myths Information*	*Basic information Part2*
A	X			X
B	X	X		X
C	X		X	X
D	X	X	X	X
E (CONTROL)				

"Basic information" Part1: Definition and information about driving whilst fatigued, including statistics for young people
"Basic information" Part 2: Appropriate behaviours to avoid driving whilst fatigued

Participants & sampling

230 participants (average age of 21 years, 51.7% female, and 43% rural) were recruited outside each of 7 RTA motor registries (5 Urban – Central, Castle Hill, Campbelltown, Ryde, Chatswood and 2 Rural – Coffs Harbour and Dubbo), chosen to achieve a range of socio-economic status. All people entering the grounds of the motor registry who appeared to be between 17 and 25 years old were approached. These people were invited to participate in a study about "young drivers' attitudes toward driver fatigue" being conducted by researchers from the NSW Injury Risk Management Centre at the University of NSW and the Motor Accidents Authority. Potential participants were told that they were selected in virtue of being a driver attending a motor registry; and asked two screening questions to ensure that they were between 17 and 25 years old and held a current NSW drivers license. They were instructed that they would be asked to read a brief information pamphlet and complete a short questionnaire, taking about 15 to 20 minutes, while waiting for service in the registry; and that they would be offered the opportunity to answer a question about the information pamphlet to go in a draw for one of 10 prizes (each 2 movie tickets). Potential participants were assured that their involvement was entirely voluntary, that they could withdraw at any time, and that their responses would be confidential. This methodology has the advantages of allowing approach to a wide sector of the driving public, and a high and apparently unbiased response rate. The refusal rate was approximately 30%, however, approximately 15% of remaining questionnaires were substantially incomplete and so not included in the sample.

Initially, participants were randomly assigned to the 5 groups outlined in the "Design" section, by handing out corresponding brochures (and questionnaires) consecutively. That is, for every 5 people agreeing to participate, researchers handed out a Group A brochure, followed by a Group B brochure, then a Group C brochure and then a Group D brochure, each with a questionnaire, and then just a questionnaire to a Group E participant. Toward the end of recruitment, targeted sampling was employed to ensure equal proportions of males versus females, and 17-19 vs. 20-22 vs. 23-25 year olds, in each of the 5 groups. The final sample comprised 50 participants in Group A, 50 participants in Group B, 41 participants in Group C, 42 participants in Group D, and 44 participants in Group E (plus 3 participants for whom condition was not recorded, who were excluded from most analyses).

Materials

Participant information statement & consent forms

When participants were approached to participate in the study they were given a Participant Information Statement that outlined the aims and procedures involved in the study (as described in "Participants and Sampling" Section), and emphasised information relating to ethical considerations (random selection, confidentiality, voluntary participation, right to withdraw, and procedure for complaints and enquiries) [see Appendix C]. Attached were a "Consent form" and "Revocation of consent form" [see Appendix C].

"Anti-fatigued-driving" brochure

The cover of the "anti-fatigued-driving" brochure read: "Driver Fatigue and You", in keeping with the theme throughout the brochure of personalising risks. The basic content and

ordering of the message is described in the "Design" Section. The complete version of the "anti-fatigued driving" brochure that was given to Group D is presented in Appendix D.

Basic information (Groups A-D)

All "message" group participants (Groups A-D) received "Basic information" designed to mimic the information available in the better approaches to reducing fatigued driving (e.g. RTA 2005a, 2005b), but to make this information more specific to young drivers. Specifically, the "Basic information" included

1. a definition and description of driver fatigue;
2. a reminder that it can affect anyone;
3. several reminders that driver fatigue increases the chance of crashing;
4. an account of why driving whilst fatigued is dangerous (e.g. impaired ability and judgement);
5. a reminder that one of the symptoms is a decreased ability to judge tiredness;
6. information about factors other than driving that contribute to driver fatigue (e.g. amount of sleep the night before, previous activities, time of day);
7. statistical risk information specifically related to young drivers (presented in both written and pictorial formats.

The risk information that was provided was[6]:

- In 2001, 3398 crashes on NSW roads were caused by driver fatigue, in which 2002 people were either killed or injured
- In 30% of these crashes a young person aged 17-25 was the fatigued driver at fault.
- 17-25 year olds have a 63% greater chance of being the driver at fault in a fatigue-related crash than a 40-49 year old
- 3 in every 10 fatigued drivers who kill or injure someone on NSW roads will be aged between17 and 25 years.

Figure 15 was provided to depict the statistics from the first two dot points above graphically.

The remainder of the "Basic information" offered explicit recommendations of appropriate behaviours to avoid driving whilst fatigued. These appeared at the end of the pamphlet in keeping with the theoretically ideal order for presenting motivational and behavioural information (see Job, 1988). The behavioural recommendations that were offered were:

If fatigued while driving:

- ☑ Stop and rest

Before starting to drive:

- ☑ Get at least eight hours of sleep the night before you leave.
- ☑ Avoid long drives after work, school, or strenuous activity.
- ☑ Check that any medications you are using will not cause side effects while you are driving.
- ☑ Plan your drives – determine how long you will travel and when (or where) you will take a break.
- ☑ Share the driving where possible.

[6] These figures differ slightly from those given in the "Background" section, because they are based on 2001 data (the most recent available when the brochure was designed; RTA, 2001).

- ☑ Take a break from driving at least once every 2 hours - breaks from driving help you to avoid the effects of fatigue and are even more helpful if taken early in a trip.
- ☑ Pull over and stop driving if you are feeling any of the signs of fatigue.

Finally, the "Basic information" offered the message- "You know you shouldn't let a friend drink and drive, so why should you let them… drive while fatigued?"- in keeping with the importance of using passengers to influence the driver (particularly in the absence of legislation and enforcement), as recognised by the RTA and reflected in a radio campaign of Easter 2001 (RTA, 2001).

Risk ladder (Groups B & D)

In order to contextualise and guide the interpretation of the risk information provided in the "basic message" by showing that fatigue-related car crashes are relatively common when compared to other negative life events, Groups B and D also received risk information regarding other generally known negative life events. This information was presented as a "Risk ladder" displaying driver fatigue as being near the top in a hierarchy of risk scenarios [see Figure 16]. This visual strategy has proven successful in reducing personal perceptions of invulnerability for other health concerns, such as cancer (Lipkus et al.,1999). Importantly, this research has shown associated improvement in behavioural practices.

The accompanying message was: "Fatigue related crashes may be more common for young drivers than you think… In [the] diagram you can see that the rate at which young drivers cause crashes due to fatigue is actually a lot higher than the rate of problems that you may think are the main killers of young people, like suicide and cancer. The statistics shown in the diagram apply to YOU because they are based on information about 17-25 year olds".

The statistics presented for speeding or drink driving were obtained by taking the number of crashes involving a particular contributing factor (speed or fatigue), and then calculating the proportion involving a 17-25 year old vehicle controller. Thus, in NSW in 2003 there were 8,452 crashes involving speeding and 3,548 17-25 year old vehicle controllers involved in a crash that was caused by speeding. Thus, young vehicle controllers were involved in approximately 42% of crashes caused by speeding, or roughly 4,000 in 10,000 speed-related crashes involved a young vehicle controller. Similarly, in NSW in 2003 there were 3,700 crashes involving fatigue and 1,088 17-25 year old vehicle controllers involved in a crash that was caused by fatigue. Thus, young vehicle controllers were involved in approximately 29% of crashes caused by fatigue, or roughly 2,000 in 10,000 fatigue-related crashes involved a young vehicle controller (perhaps we should have rounded *up* to 3,000 in 10,000). When the statistics are calculated in this way, the relativities between young controller involvement in speeding- versus fatigue-related crashes are accurate.

The other statistics in the "Risk ladder" are taken from *Australia's Young People: Their Health and Wellbeing* (Australian Institute of Health and Welfare. Australia's Young People: Their Health and Wellbeing 2003. AIHW Cat. No. PHE 50. Canberra: AIHW), an analysis of ABS 1997 National Survey of Mental Health and Wellbeing data by the Australian Institute of Health and Welfare (AIHW). Statistics represent the proportion of young people suffering from a particular health problem.

Figure 15: Diagram depicting young driver involvement in fatigue-related crashes

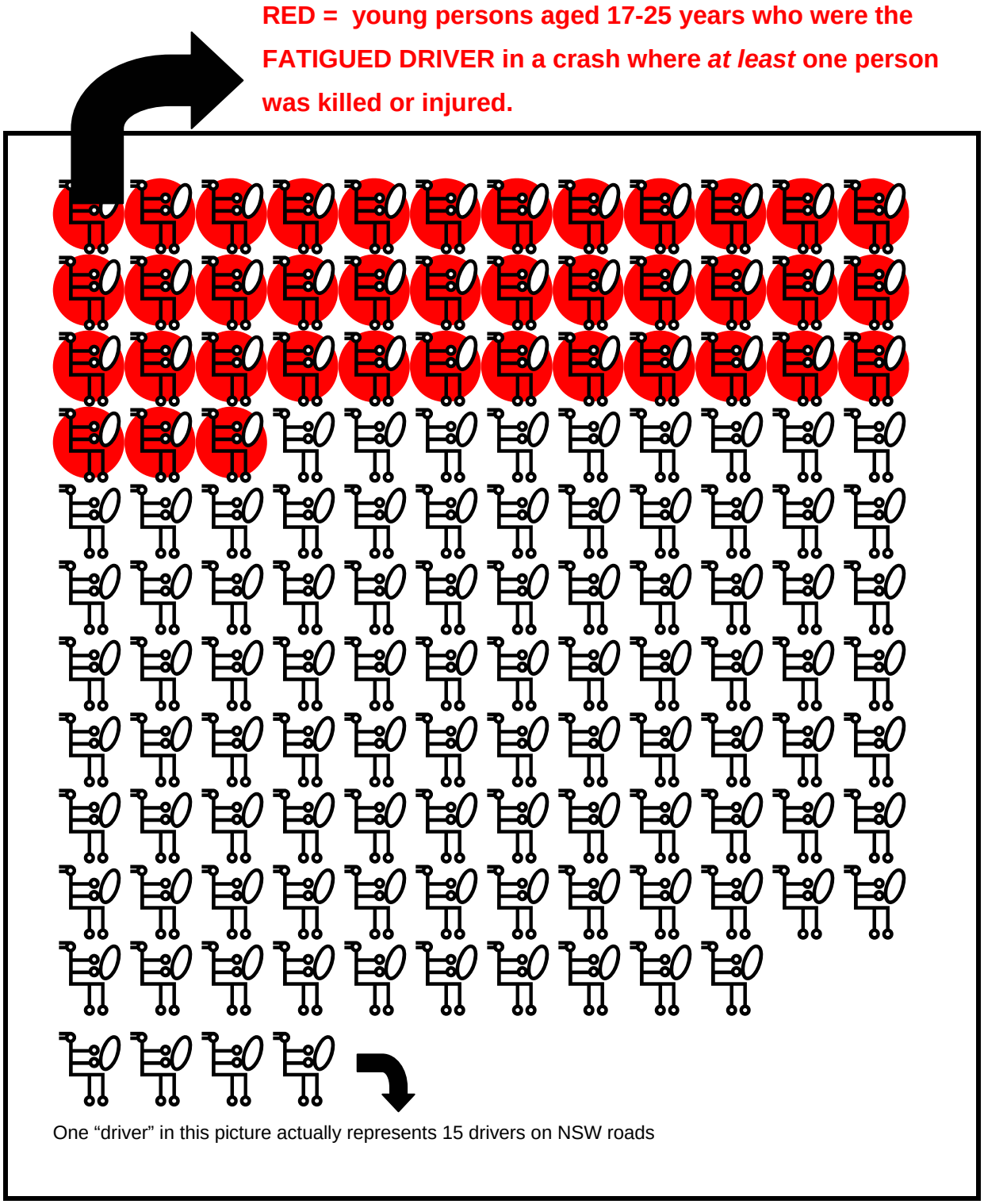
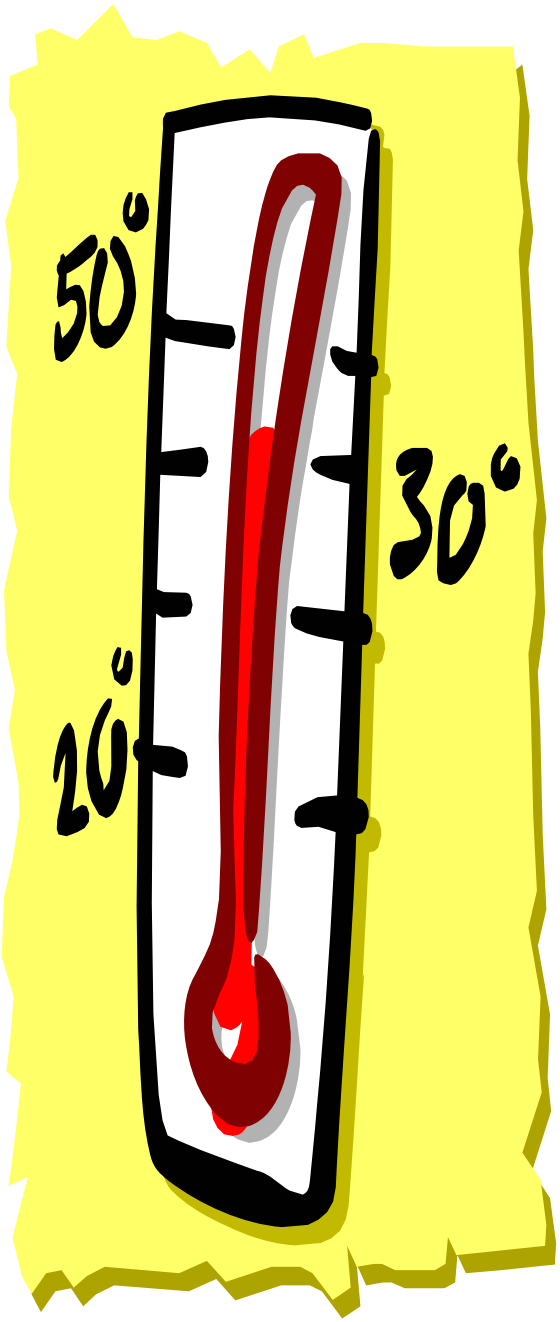


Figure 16: "Risk ladder" diagram depicting statistics relating to young driver involvement in fatigue-related crashes in the context of the involvement of young people in other negative events.

HIGH RISK!



4,000 in 10,000 crashes are caused by a young driver speeding

2,000 in 10,000 crashes are caused by a fatigued young driver

1,000 in 10,000 suffer from obesity

600 in 10,000 have depression

34 in 10,000 have Chlamydia, a Sexually Transmitted Disease

3 in 10, 000 have cancer

1 in 10,000 will commit suicide

REALLY LOW RISK

Some of the statistics in this 'Risk Ladder' are incorrect. This 'Risk Ladder' was designed for an experimental protocol and neither the 'Risk Ladder' nor the statistics contained within should be quoted or used as a public education resource.

Debunking common myths (Groups C & D)

Groups C and D received information to refute several common myths about situations that define the risks of driver fatigue, and so to enhance and personalise these risks. Myths included perceived efficacy of several inappropriate techniques for combating fatigue (as observed in Study 1). The myths, phrased in personal terms, and the corresponding refutations, were:

1. *Keeping my window open, chatting with friends in the car, or listening to music will keep me awake and alert*
   Fresh air might seem to make you feel better for a while, but only sleep will actually reduce your fatigue. Talking to friends or playing loud music are really just extra things for you to concentrate on when you're already too tired to concentrate.
2. *Coffee or energy drinks will keep me awake*
   The stimulating and performance enhancing effects of caffeine last for a short time only. After this, you become even more fatigued than before the caffeine.
3. *I'm a good driver, so I can handle my car and avoid crashing while fatigued*
   Even if you are a good driver, when you're fatigued you can easily misjudge your environment or not react as quickly as usual.
4. *I don't need much sleep or rest*
   Everyone needs sleep. Your body is programmed to feel fatigued after performing the same activity - like driving, working, or sport - over an extended period of time.
5. *Driver fatigue is only a problem that happens on long drives or country roads*
   Fatigue affects your driving wherever you are. Most fatigue-related crashes or near-crashes occur when drivers have actually been on the road for less than 2 hours. Remember, it's often what you did before the drive that causes fatigue (like not sleeping, or working, or partying), not the drive itself.
6. *Most fatigue-related crashes happen at night, when people should be sleeping*
   Fatigue can happen at anytime, depending on your lifestyle. Most fatigue-related crashes occur at night-time (10am-6am) or in the afternoon (1pm-3pm)

Questionnaire

The Study 2 questionnaire [see Appendix E] was modified slightly from the questionnaire employed in Study 1 in order to best detect changes achieved by the "anti-fatigued-driving" brochure. Importantly, questions regarding behaviour (frequency of driving whilst fatigued or of using inappropriate techniques to avoid driving whilst fatigued) were asked in terms of intended future behaviour.

In order to minimise the demand characteristic of participants simply parroting the message in the brochure, instructions on the questionnaire urged participants to "answer accurately and honestly as possible, based on what YOU know, your own experiences and opinions, and also the information you have just read. We really want to know what you think, so for each question please stop and think about what you really believe before you answer". Instructions also reminded participants of the need to read the brochure before answering the questionnaire, and told "message" group participants of the procedure for answering a related question in order to enter a prize draw.

Fewer questions were included regarding *knowledge of, and attitudes toward, penalties* for driving whilst fatigued. Respondents simply rated the chances of being pulled over by police for negligent driving due to fatigue, for themselves and for the "average driver of

your age and sex" [Q1d and Q2d]. Response options were: very low, low, average, high, very high.

Several questions regarding *crash risk perceptions* were also omitted. Nonetheless, respondents still indicated the extent to which they felt that driving whilst fatigued increases the chances of having a car crash under good conditions [Q9]. Possible responses were: not at all, slightly, moderately, or considerably. Respondents also rated their agreement with the statement "Driver fatigue isn't a problem in NSW" (strongly agree, agree, disagree, strongly disagree, don't know).

Because of the atypical pattern of optimism and pessimism bias observed in Study 1, participants were asked to report absolute risk assessments for themselves and their peers separately, rather than simply employing comparative risk perception items. Further, each situation involving fatigue was no longer presented immediately following the parallel non-fatigue situation

Perceived relative crash risks were measured by asking respondents to rate the chances of crashing when fatigued, or crashing when not fatigued for themselves and the "average driver of your age and sex" [Q1a,b, Q2a, rather than making a single comparative rating]. Response options were: very low, low, average, high, very high. Using the same responses, participants indicated, for themselves and the "average driver of your age and sex" (again separately), driving safety and their driving skill, both when fatigued and not fatigued, as well as their amount of driving experience, chances of crashing if speeding, and chances of crashing if drink driving [Q1e,f,g,h,I,k,l, Q2e,f,g,h,I,k,l].

Respondents indicated how likely they would be *in future* to use each of 11 *techniques to get through a drive if feeling fatigued* [see Table 10] [Q8]. Responses were: definitely not, highly unlikely, probably, highly likely, definitely.

Table 10: Techniques to keep driving whilst fatigued offered in Study 2 questionnaire

Wind down the window to feel a breeze
Turn the music up or sing
Chew gum or eat whilst driving
Drive faster
Chat with others in the car
Talk on a mobile phone
Stop on the side of the road and have a rest
Drink or take caffeine (coffee, coke, red bull, guarana tablets)
Try to ignore it or think about other things
Try to keep your eyes wide open
Take drugs to keep you awake or alert

Normative attitudes to driving whilst fatigued, were assessed by asking respondents to indicate how they, their friends, and their parents (separately) would describe a) "driving whilst fatigued, tired, or worn out"; and b) "pulling over to the side of the road when feeling tired". Response options were: safe, sensible, a waste of time, silly, or dangerous [Q10a-c, Q11a-c].

Respondents indicated how many minutes they could drive before feeling fatigued, "provided you have had a good night sleep and have been awake for a few hours before starting to drive" [Q5]. Respondents answered a parallel question in relation to "the average driver of your age and sex" [Q6]. Respondents also rated the chances of becoming fatigued when driving short distances and when driving long distances for themselves and the "average driver of your age and sex" [Q1b,c, Q2b,c]. Response options were: very low, low, average, high, very high.

Current frequency of driving whilst fatigued was measured (to be used as a covariate in analyses of behavioural intention) for the self and "the average driver of the same age and sex" [Q3, Q4]. Possible responses were: three or more times a week, once or twice a week, once or twice a month, less than once a month, or never.

Intended frequency of driving whilst fatigued was assessed by having participants rate the frequency with which they would perform the behaviours in the circumstances identified in Table 11 [Q7]. Responses were made by placing a vertical mark on a dimension anchored at 0%/Never, 50%/Sometimes, and 100%/Always.

Table 11: Intended behaviours offered in Study 2 questionnaire

When you have slept for less than 5 hours but need to drive somewhere, how often will you drive?
When you need to drive somewhere that is about 3 hours away, how often will you do the whole drive without a break?
When you are driving, and aware you feel fatigued, how often will you keep on driving?
When you have been driving for 2 hours or more (or you know that you are fatigued) and you pass a Driver Reviver Stop, how often will you keep on driving?

Respondents in the "message" groups rated the brochure in terms of ease of reading, interest, and personal relevance. Response options were: not at all, slightly, moderately, very, and completely. A slightly different version of the questionnaire given to Group E participants omitted these (for them irrelevant) questions.

Data was also collected regarding socio-demographic variables (e.g. age, gender, highest level of education, occupation and employment situation e.g. shiftwork and postcode) and aspects of driving experience (e.g. driver's license status, year and month of holding Learner license, hours spent driving per week).

Question to enter the prize draw

In order to promote participants in the "message" groups reading the messages attentively before completing questionnaires, they were told that when they returned their completed questionnaires to the researcher they would be given a question, a correct answer to which would put them in the prize draw (for one of 10 pairs of movie tickets). Control group participants were simply asked to provide their details to enter the prize draw. In fact, all participants who returned a completed questionnaire were entered into the draw.

Procedure

The research field team were trained in the field procedures (including approaching and recruiting participants, and collecting forms and questionnaires). Researchers attended the selected registries during peak times (e.g. lunchtimes) to achieve efficient data collection. They worked in pairs, and carried a mobile telephone at all times (to satisfy safety requirements of the UNSW Ethics Committee). Researchers positioned themselves on the footpath immediately outside registry grounds and approached potential participants as described in the “Sampling and participants” Section. Consenting participants were given the Participant Information Statement and “Revocation of consent form” to keep. Researchers gave consenting participants a brochure to read, and questionnaire to complete, while they waited for service. Allocation to groups depended on which brochure was provided (except for participants in the control Group E, who received no brochure, and a slightly different version of the questionnaire). For “message” groups researchers emphasised the need to read the brochure carefully before responding to the questionnaires (and reminded participants that when they returned the completed questionnaires they would be given an opportunity to answer a question about the brochure in order go into a prize draw). When participants in the “message” groups returned the completed questionnaire they responded to a question about the materials, and provided contact details, on a purpose-designed form. Participants in the control group simply provided their details to enter the draw. In fact, all participants were entered in the prize draw.

Statistical analysis

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS).

First, descriptive statistics are provided to characterise the sample.

Then, for each variable relating to driving whilst fatigued, descriptive statistics are provided for each of the 5 groups. Planned comparisons of the “no message” control group (Group E) with each of the 4 “message groups (Groups A – D, separately) are then reported. These planned comparisons were conducted employing univariate ANOVA Type 4 (which allows for missing cells and unequal groups sizes). If two “message” groups differed from the control group they were compared to each-other using the relevant contrast within ANOVA.

A Type I error rate of .05 was adopted for all statistical comparisons, and all tests were conducted two-tailed. It will also be noted when each of the 4 “message” groups differed *nonsignificantly* from the “no message” control group in a consistent direction. The probability of this outcome is .05.

Results and discussion

Sample characteristics

Table 12 presents descriptive information regarding the personal characteristics and driving experience of the sample employed for Study 2.

Table 12: Personal characteristics and driving experience of the sample employed for Study 2

Characteristic	Number (%)
Age (years)	
17-19	86 (37.4)
20-22	80 (34.8)
23-25	64 (27.8)
Mean (s.d.)	*20.71 (2.37)*
Sex	
Female	111 (48.3)
Male	119 (51.7)
Highest level of education	
Primary school only	1 (0.4)
Year 7-9	6 (2.6)
School certificate	48 (21.0)
HSC	59 (25.8)
Tafe or equivalent	43 (18.8)
Tertiary	72 (31.4)
Occupation	
Student	73 (32)
Professional/managerial	29 (12.7)
Tradesperson	45 (19.7)
Clerical	15 (6.6)
Retail/sales	30 (13.2)
Manual/factory worker	14 (6.1)
House duties	5 (2.2)
Truck driver	4 (1.8)
Courier	1 (0.4)
Other occupation	0
Unemployed	12 (5.3)
Type of driver's license held	
Learners	12 (5.2)
Old p's	6 (2.6)
Red P-plates	45 (19.6)
Green P-plates	73 (31.7)
Full license	87 (37.8)
Motorcycle	0.0
Large vehicle	4 (1.7)
License disqualified	3 (1.3)
Years since Learner's obtained	
Mean (s.d.)	*4.06 (2.30)*

Characteristic	Number (%)
Mean number of hours spent driving each week	
<5	37 (16.5)
5-9	39 (17.4)
10-14	48 (21.5)
15-20	62 (27.6)
>20	38 (17)
Mean (s.d.)	*16.13 (16.04)*
Hours worked	
Normal hours	120 (56.9)
Shiftwork	73 (34.6)
Nightshift	17(8.1)
Hours not specified	1 (.5)

The sample achieved a reasonably balanced distribution across age and gender. The education level of the sample may be somewhat higher than those of the general population of young drivers.

License status differed significantly between the groups %)($F_{.05, 4, 222}$=2.82, p=.026). The "no message" control group were more likely to have a Learner license than Group A (z=-2.658, p=.008; 13% vs. 0%). Length of licensure also differed between the groups ($F_{.05, 4, 221}$=2.53, p=.04). The "no message" control group had their licenses for a significantly shorter period than Group A ($t_{.05, 92}$=2.24, p=.027; 42.55 vs. 55.44). There were no significant group differences in age, number of hours driven/week, education level, occupation, hours worked or gender by condition (all p's >.06).

Chance of detection for driving whilst fatigued

The messages did not target chance of detection directly, but *did* mention impairment of driving skills, and so might increase perceived chance of detection. No prediction could be made regarding the impact on perceived relative chance of detection.

Figure 17 presents the mean ratings of the chance of being pulled over by police for negligent driving due to fatigue, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

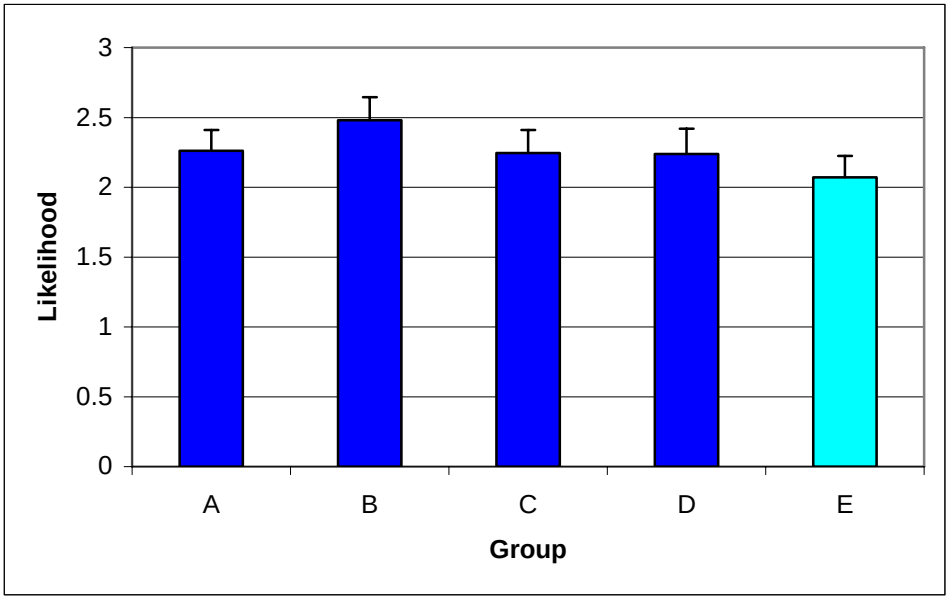


Figure 17: Mean ratings of the chance being pulled over by police for negligent driving due to fatigue, for each of the 5 groups.

Whilst there was a tendency for the "no message" control group to rate their chances lower than the message groups, none of the planned comparisons was significant (all p's >.07).

Relative ratings were computed by subtracting average peer ratings from self ratings (so that a more negative mean relative rating reflects greater optimism bias in the sample). Figure 18 presents the mean relative ratings of the likelihood of being pulled over by police for negligent driving due to fatigue, for each of the 5 groups.

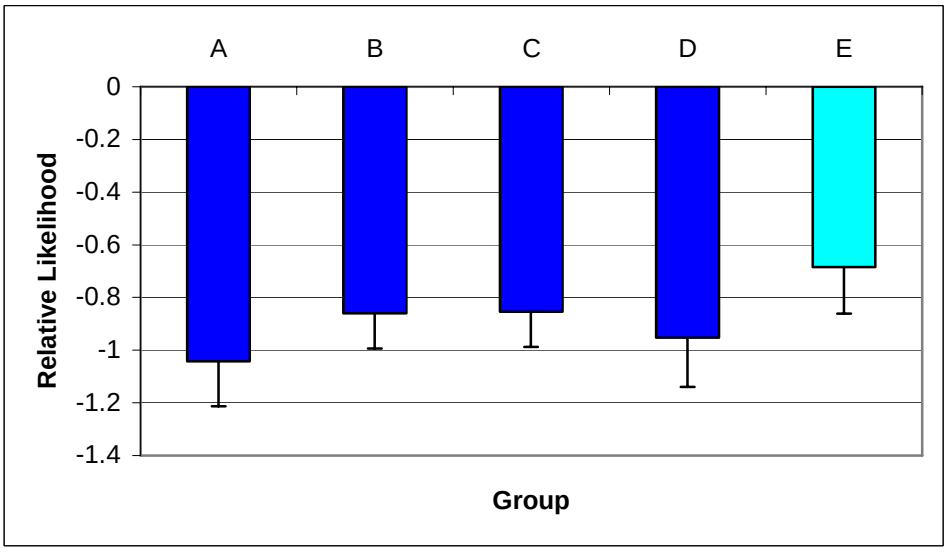


Figure 18: Mean relative ratings of the chance being pulled over by police for negligent driving due to fatigue, for each of the 5 groups.

Whilst there was a tendency for the “no message” control group to display less optimism bias than the message groups, none of the planned comparisons was significant (all p’s > .12).

Crash risk of driving whilst fatigued

Study 2 messages aimed to increase awareness of the crash risks posed by fatigue in particular. Additional information on interpreting risk information (as a “Risk ladder”) presented to Groups B and D may enhance this effect. Discussion of crashes and crash statistics may increase awareness of the crash risks associated with other risky driving behaviours, and mention of speeding in the “Risk ladder” might have particularly increased awareness of the crash risks associated with this behaviour in Groups B and D. Any effects on crash risk, may extend to “driving safety”, though less likely to “driving skill, and unlikely to “experience”.

Figure 19 presents mean estimates of the extent to which driving whilst fatigued increases the chances of having a car crash “in good conditions”, for each of the five groups. Responses were made on a scale from 0 (not at all) to 3 (considerable).

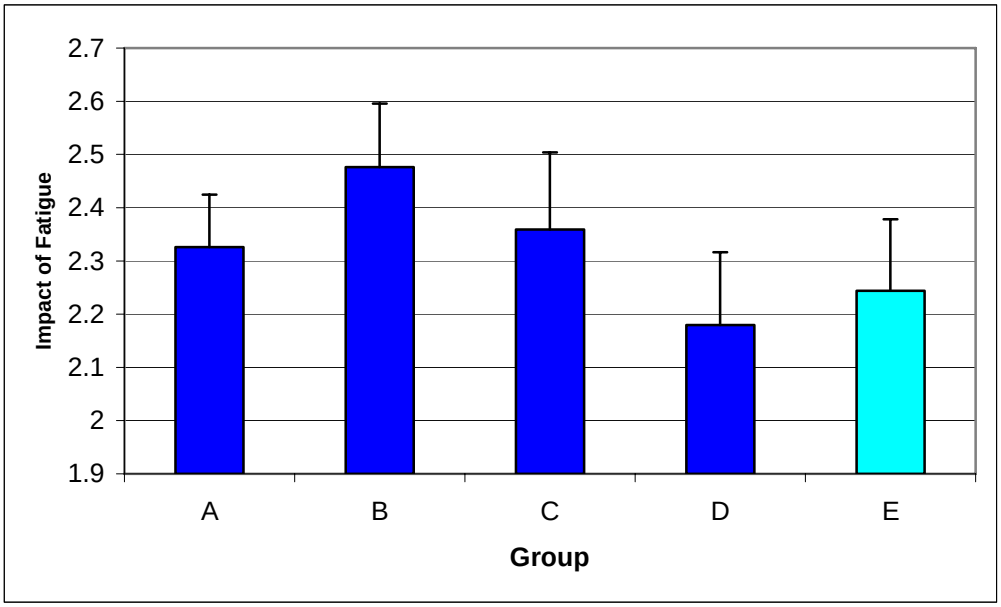


Figure 19: Mean estimates of the extent to which driving whilst fatigued increases the chances of having a car crash “in good conditions”, for each of the five groups.

None of the planned comparisons was significant (all p’s >.19).

Figure 20 presents the mean absolute personal ratings of the chance of having a crash when fatigued, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

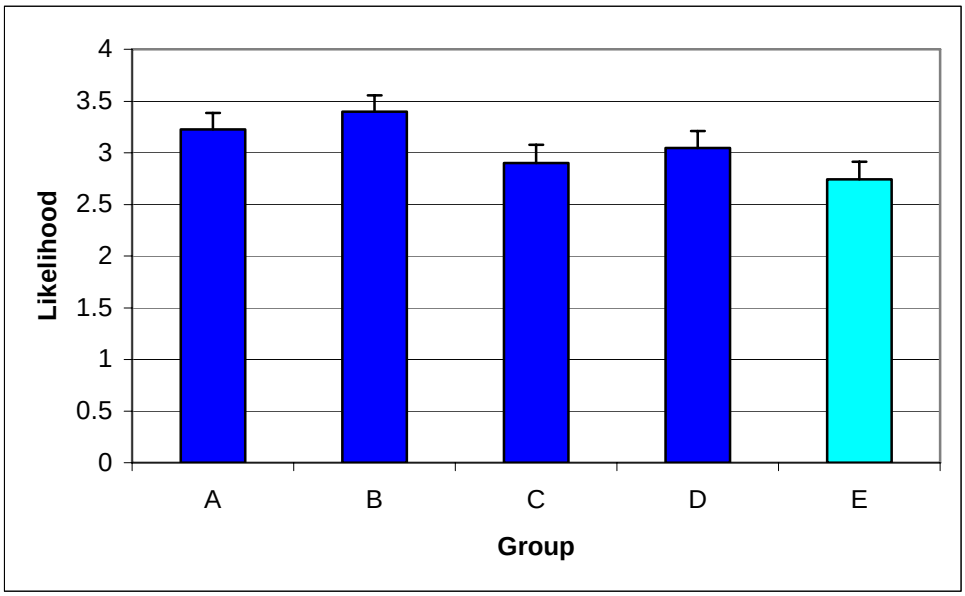


Figure 20: Mean absolute personal rating of the chance of having a crash when fatigued, for each of the 5 groups.

The "no message" control group rated their chances lower than did Group A ("Basic information" only; $t_{.05,\ 220}$= 2.08, p=.039) and Group B ("Basic information" plus "Risk ladder"; $t_{.05,\ 220}$= 2.86, p=.005). There was no significant difference between Groups A and B ($t_{.05,\ 220}$=-.791, p=.430). The tendency for the "no message" control group to rate their chances lower than did Group C and D did was not significant ($t_{.05,\ 220}$= .657, p=.512; $t_{.05,\ 220}$= 1.27, p=.207, respectively).

Figure 21 presents the mean absolute personal ratings of the chance of having a crash when not fatigued, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

None of the planned contrasts was significant, although the comparison with Group B produced a low p-value ($t_{.05,\ 220}$=1.855, p=.065; all other p's > .19).

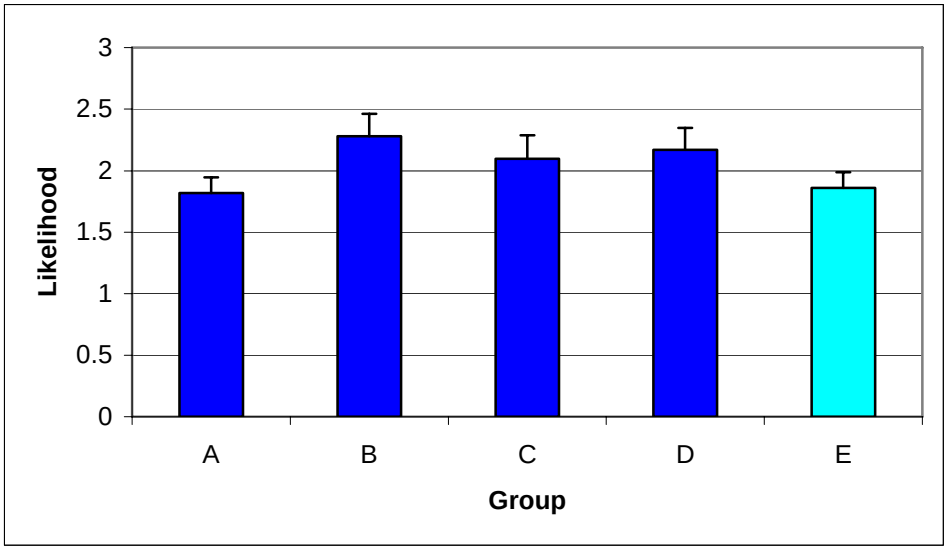


Figure 21: Mean absolute personal rating of the chance of having a crash when not fatigued, for each of the 5 groups.

Ratings of crash risk when fatigued were subtracted from ratings of crash risk when not fatigued in order to index the perceived impact of fatigue on crash risk [see Figure 22].

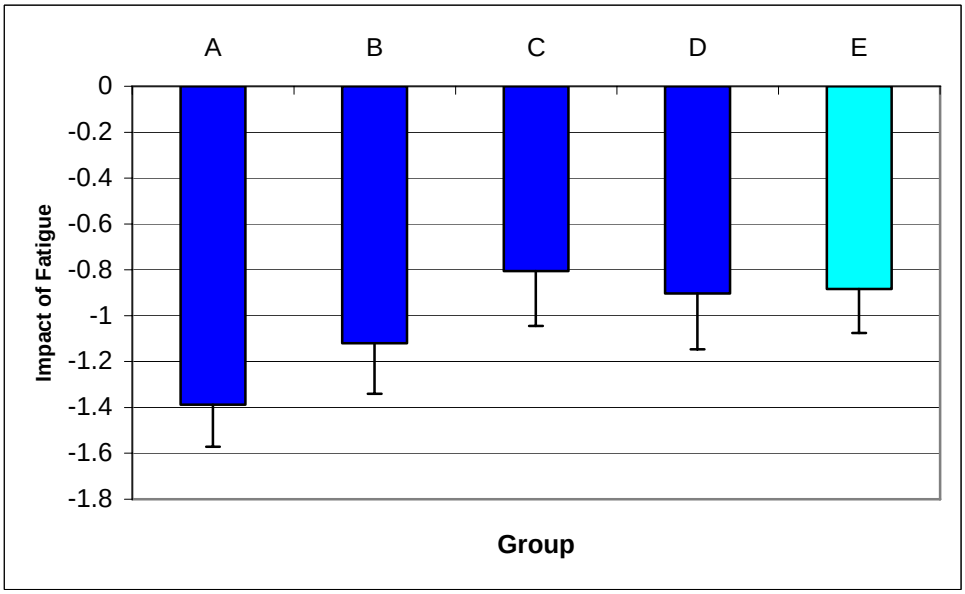


Figure 22: Mean difference between absolute personal ratings of the chance of having a crash when fatigued vs. when not fatigued, for each of the 5 groups.

None of the planned contrasts was significant, although the comparison with Group A produced a low p-value ($t_{.05,\ 220}$=-1.669, p=.097, all other p's >.43).

For the sake of comparison Figure 23 presents the mean absolute personal rating of the chance of having a crash when speeding, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

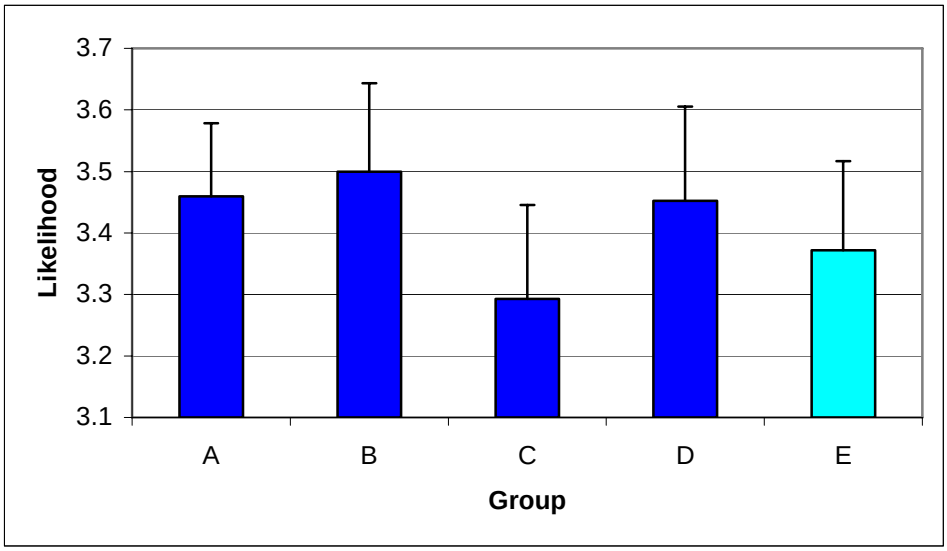


Figure 23: Mean absolute personal rating of the chance of having a crash when speeding, for each of the 5 groups.

None of the planned contrasts was significant (all p's > .52).

For the sake of comparison Figure 24 presents the mean absolute personal rating of the chance of having a crash when drink driving, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

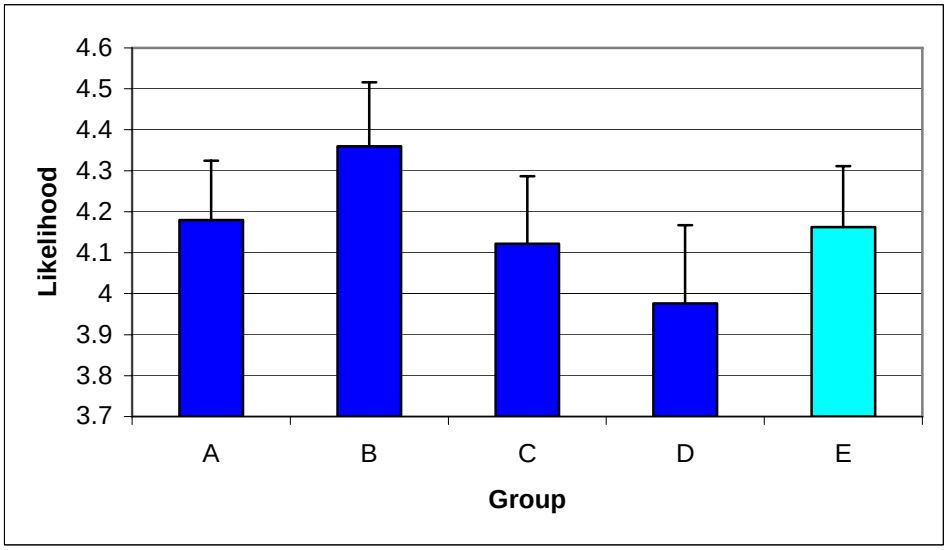


Figure 24: Mean absolute personal rating of the chance of having a crash when drink-driving, for each of the 5 groups.

None of the planned comparison was significant (all p's > .38).

Figure 25 presents the mean absolute personal rating of the ability to drive safely when fatigued, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

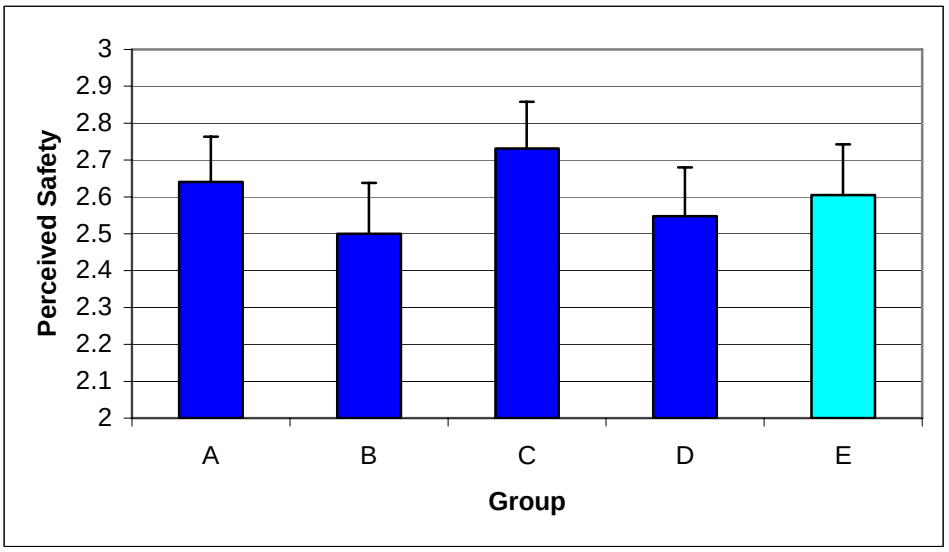


Figure 25: Mean absolute personal rating of driving safety when fatigued, for each of the 5 groups.

None of the planned comparison was significant (all p's >.51).

Figure 26 presents the mean absolute personal rating of the ability to drive safely when not fatigued, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

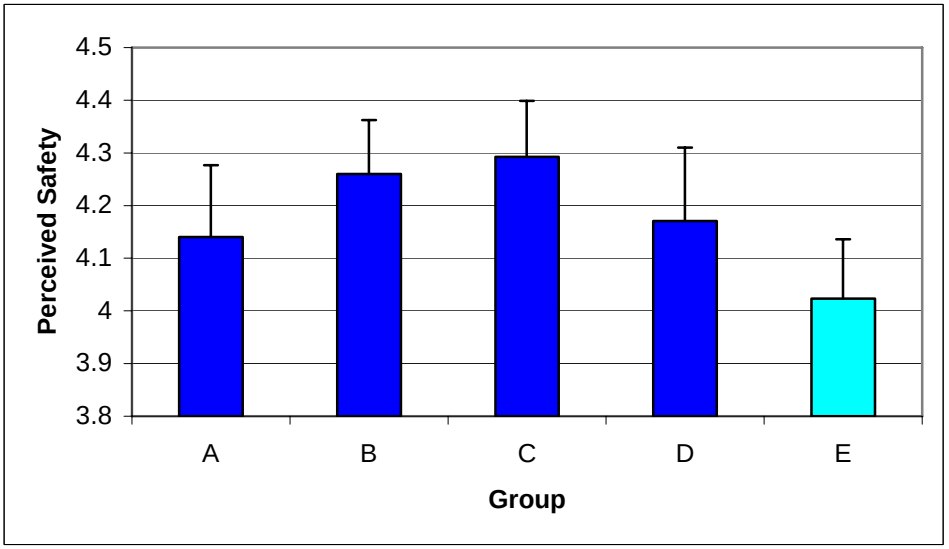


Figure 26: Mean absolute personal rating of driving safety when not fatigued, for each of the 5 groups.

The “no message” control group tended to rate their safety lower than did the “message” groups, but none of the planned contrasts was significant (all p’s >.13).

Ratings of ability to drive safely when fatigued were subtracted from the ratings of ability to drive safely when not fatigued to index the perceived impact of fatigue on driving safety [see Figure 27].

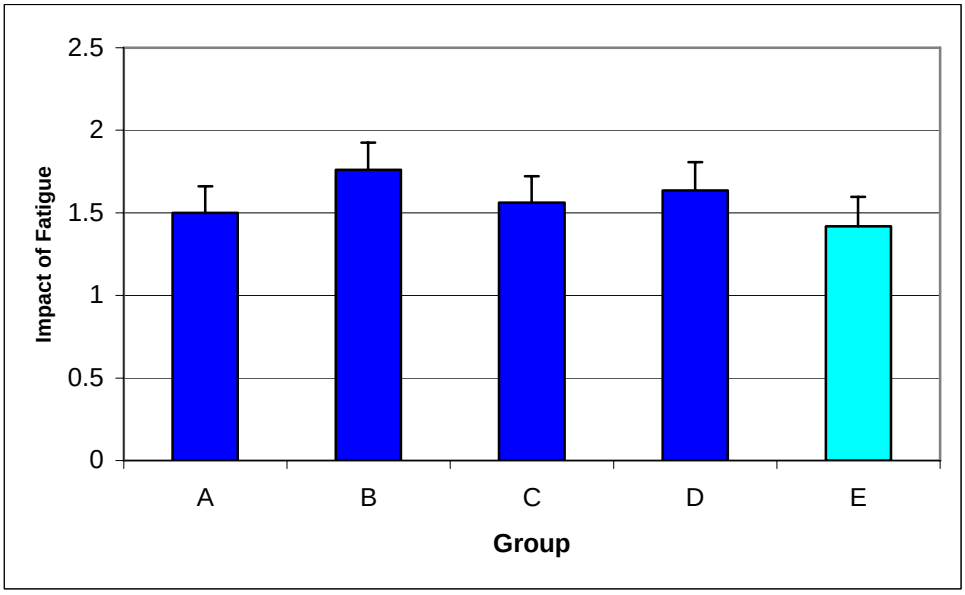


Figure 27: Mean difference between absolute personal ratings of driving safety when fatigued vs. when not fatigued, for each of the 5 groups.

The “no message” control group tended to estimate a lower impact of fatigue than did the “message” groups, but none of the planned contrasts was significant (all p’s >.14).

Figure 28 presents the mean absolute personal rating of driving skill when fatigued, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

None of the planned contrasts was significant (all p’s > .37).

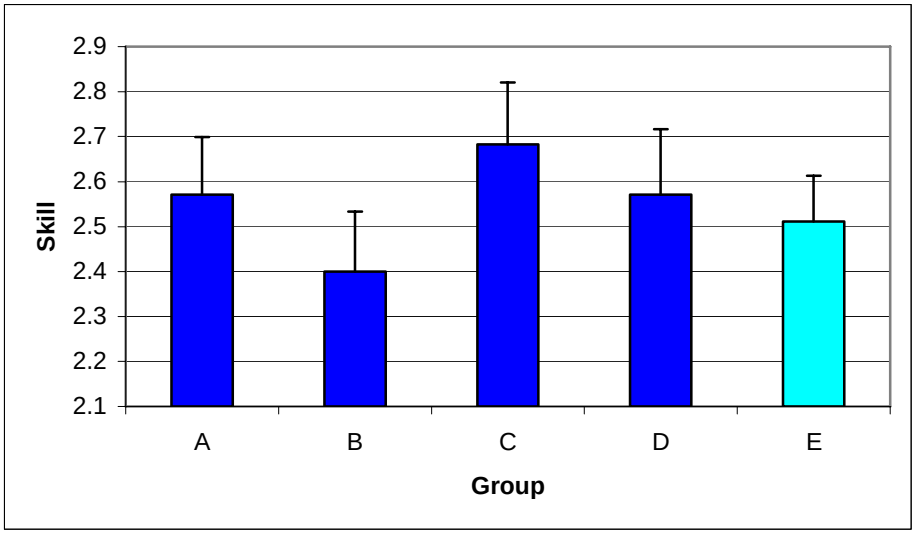


Figure 28: Mean absolute personal rating of driving skill when fatigued, for each of the 5 groups.

Figure 29 presents the mean absolute personal rating of driving skill when not fatigued, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

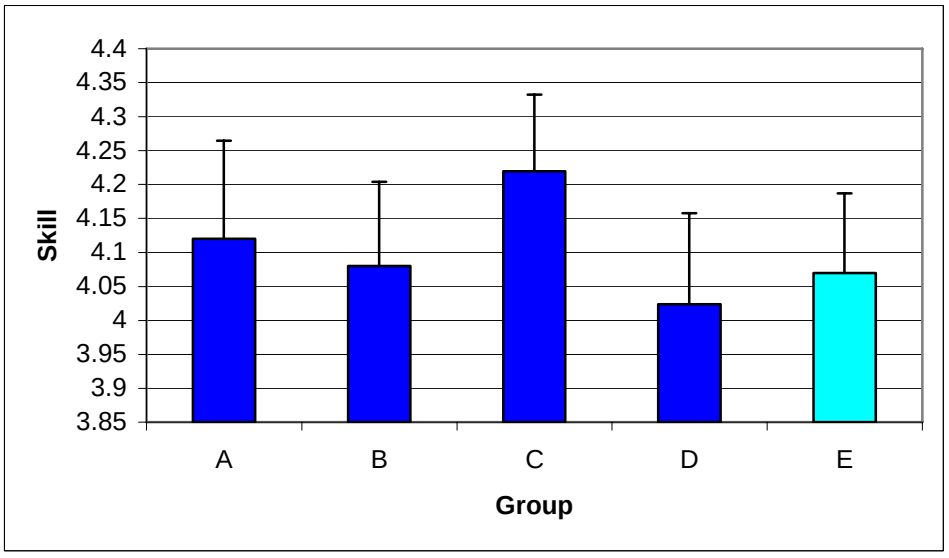


Figure 29: Mean absolute personal rating of driving skill when not fatigued, for each of the 5 groups.

None of the planned contrasts was significant (all p's >.42).

Ratings of driving skill when fatigued were subtracted from the ratings of driving skill when not fatigued to index the perceived impact of fatigue on driving skill [see Figure 30].

None of the planned comparison was significant (all p's >.63).

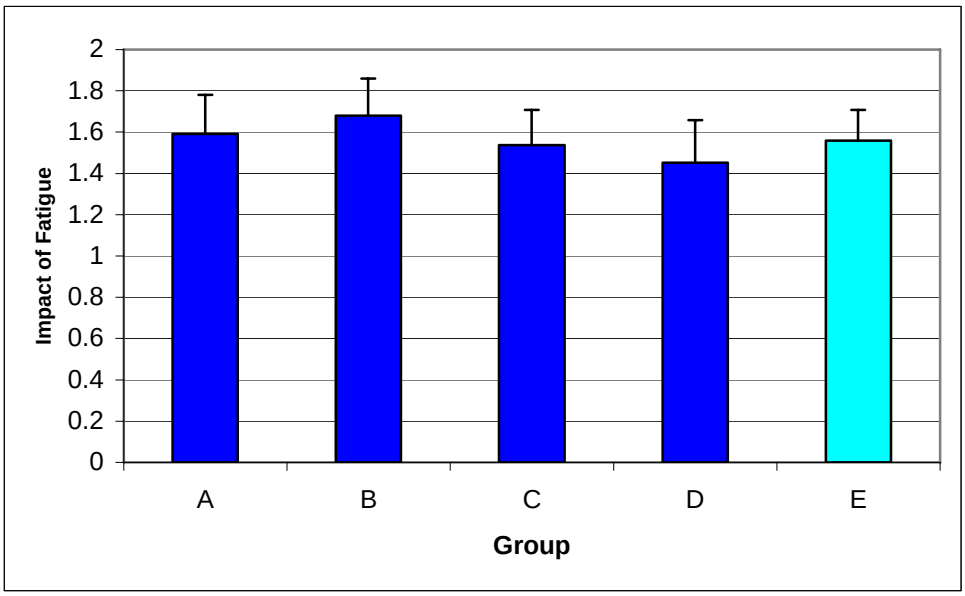


Figure 30: Mean difference between absolute personal ratings of driving skill when fatigued vs. when not fatigued, for each of the 5 groups.

Figure 31 presents the mean absolute personal rating of driving experience, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

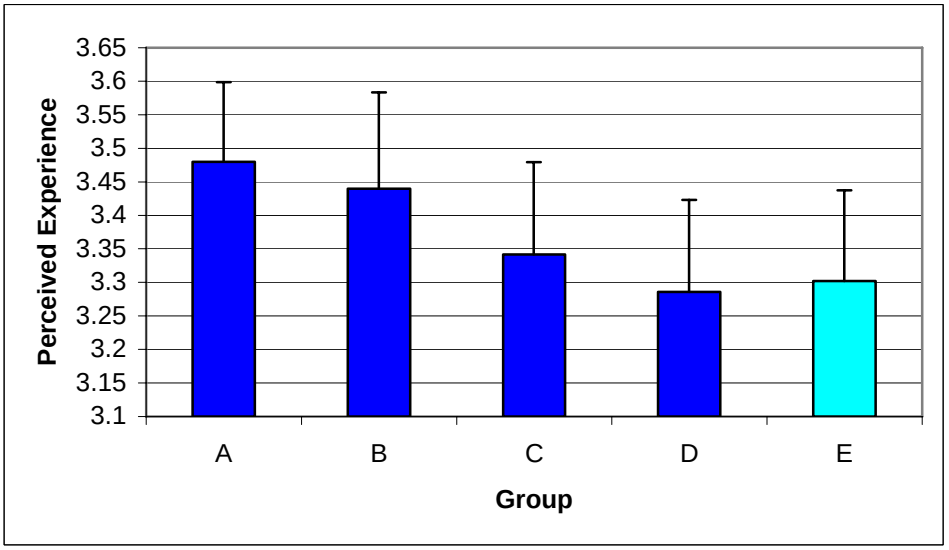


Figure 31: Mean absolute personal rating of driving experience, for each of the 5 groups.

None of the planned comparison was significant (all p's >.34).

Relative crash risks of driving whilst fatigued, & self-enhancing biases

Study 2 messages aimed to personalise the crash risks posed by fatigue (especially for Groups receiving the "Risk ladder", i.e. B and D), and so reduce self-enhancing bias[7] relative to controls. Again, some impacts on other risky driving behaviours, and on "driving safety" may also be observed.

Relative ratings were computed by subtracting average peer ratings from self ratings (so that a more negative mean relative rating reflects greater optimism bias for crashing, but a more positive mean relative rating reflects greater self-serving bias for safety, skill, and experience).

Figure 32 presents the mean relative ratings of the chance of having a crash when fatigued, for each of the 5 groups.

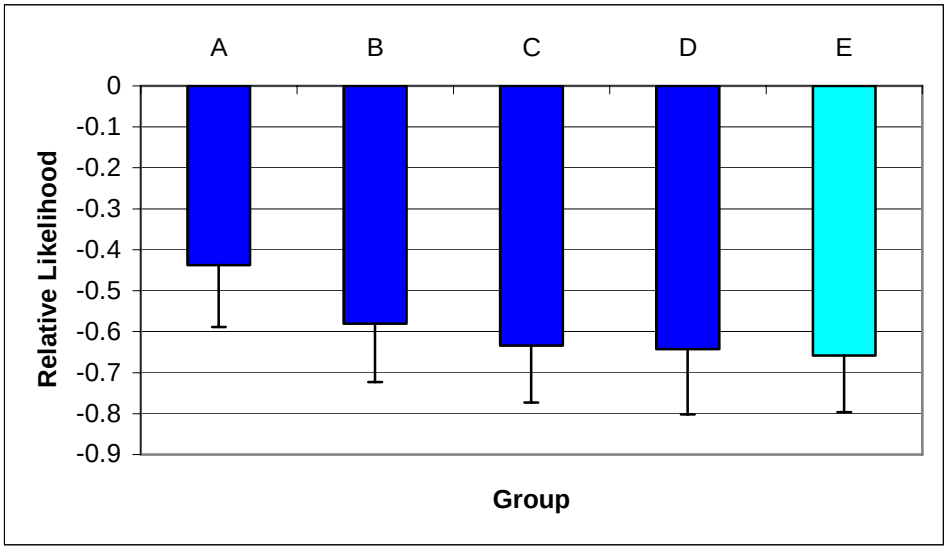


Figure 32: Mean relative ratings of the chance of having a crash when fatigued, for each of the 5 groups.

Significant optimism bias was evident ($t_{.05,\ 224}$= -9.02, p<.001).

The "no message" control group tended to demonstrate stronger optimism bias than did the "message" groups, but none of the planned contrasts was significant (all p's > .29).

Figure 33 presents the mean relative ratings of the chance of having a crash when not fatigued, for each of the 5 groups.

Significant optimism bias was evident ($t_{.05,\ 223}$= -6.19, p<.001).

[7] Although self-deprecating biases regarding situations involving fatigue were observed in Study 1, this may have reflected a response bias resulting from question format (which was adapted for Study 2).

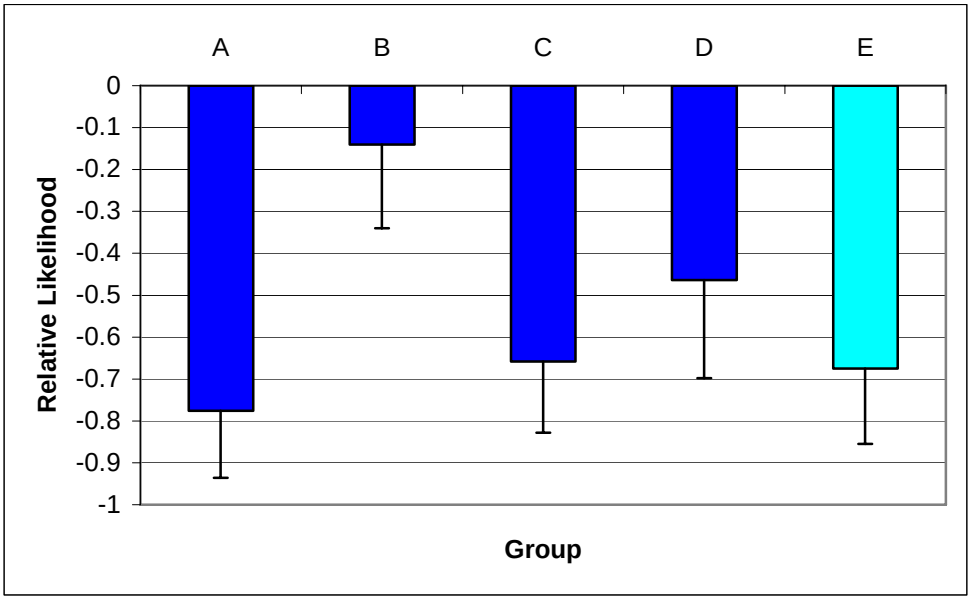


Figure 33: Mean relative ratings of the chance of having a crash when not fatigued, for each of the 5 groups.

The "no message" control group demonstrated significantly stronger optimism bias than did Group B ("Basic information" plus Risk ladder) ($t_{.05,\ 216}$=1.991, p=.048). No other planned comparison was significant (all p's >.45).

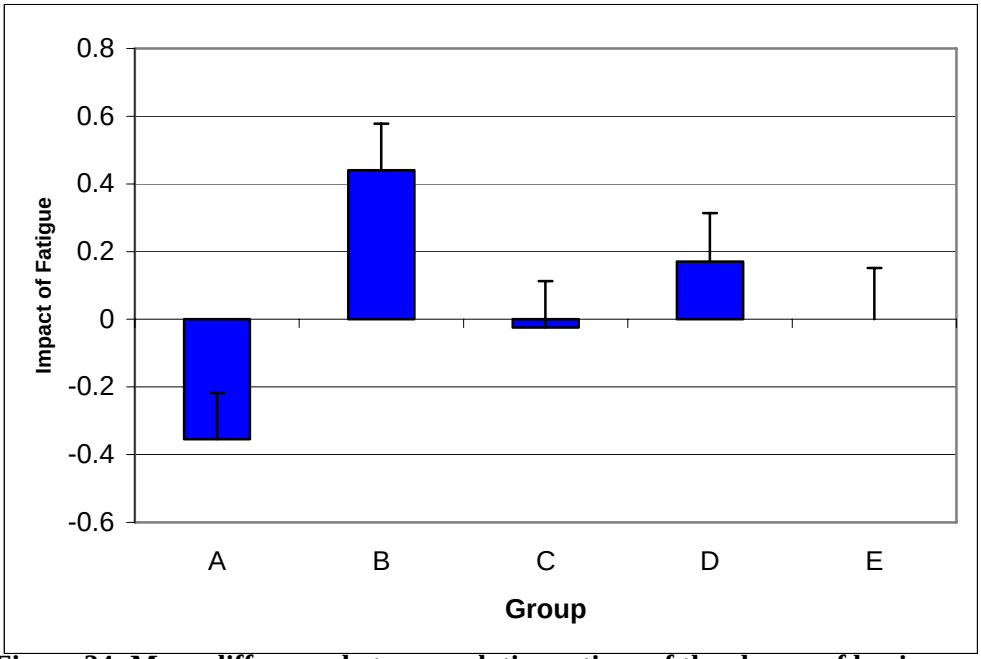


Figure 34: Mean difference between relative ratings of the chance of having a crash when fatigued vs. when not fatigued, for each of the 5 groups.

The relative ratings of likelihood of having a crash when fatigued were subtracted from the relative ratings of likelihood of having a crash when not fatigued to index the impact of fatigue on optimism bias regarding fatigue-related crashing [see Figure 34].

None of the planned comparison was significant (all p's >.15).

For the sake of comparison Figure 35 presents the mean relative ratings of the chance of having a crash when speeding, for each of the 5 groups.

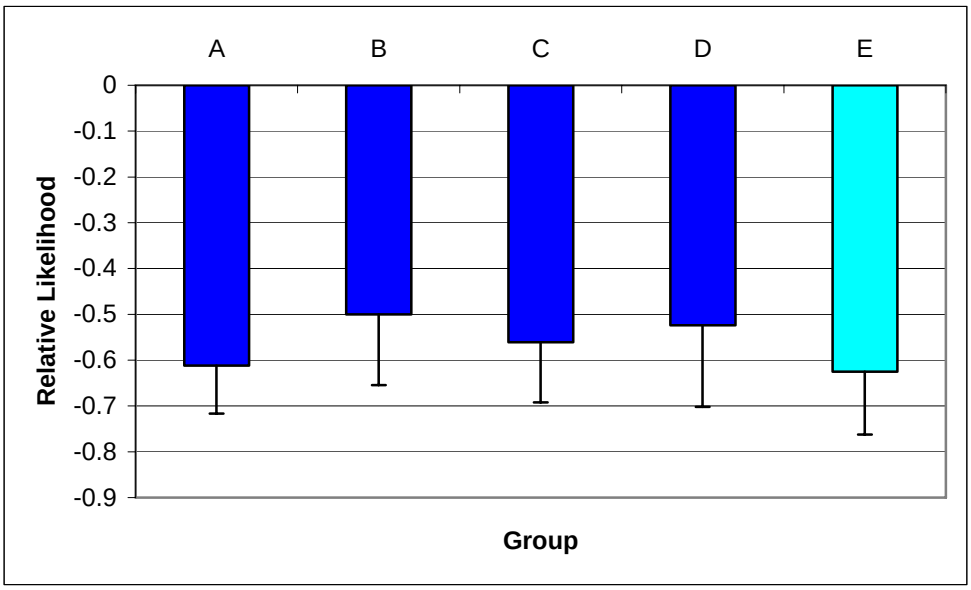


Figure 35: Mean relative ratings of the chance of having a crash when speeding, for each of the 5 groups.

Significant optimism bias was evident ($t_{.05,\ 224}$= -9.02, p<.001).

The "no message" control group tended to demonstrate stronger optimism bias than did the "message" groups, but no planned comparison was significant (all p's > .53).

Again, for the sake of comparison Figure 36 presents the mean relative ratings of the chance of having a crash when drink driving, for each of the 5 groups.

Significant optimism bias was evident ($t_{.05,\ 224}$=-2.85, p=.005).

None of the planned comparison was significant (all p's > .10).

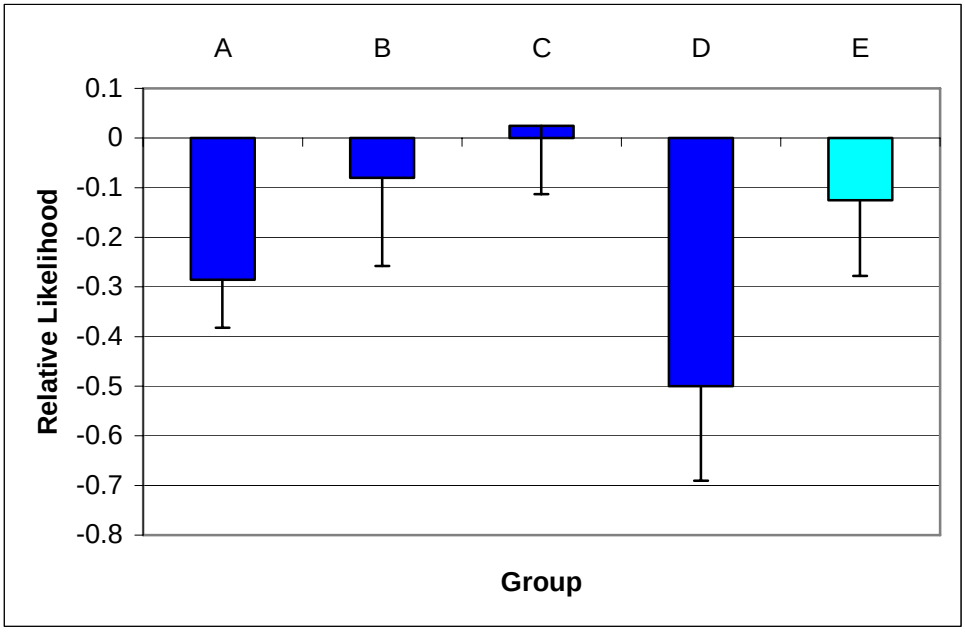


Figure 36: Mean relative ratings of the chance of having a crash when drink-driving, for each of the 5 groups.

Figure 37 presents the mean relative ratings of the ability to drive safely when fatigued, for each of the 5 groups.

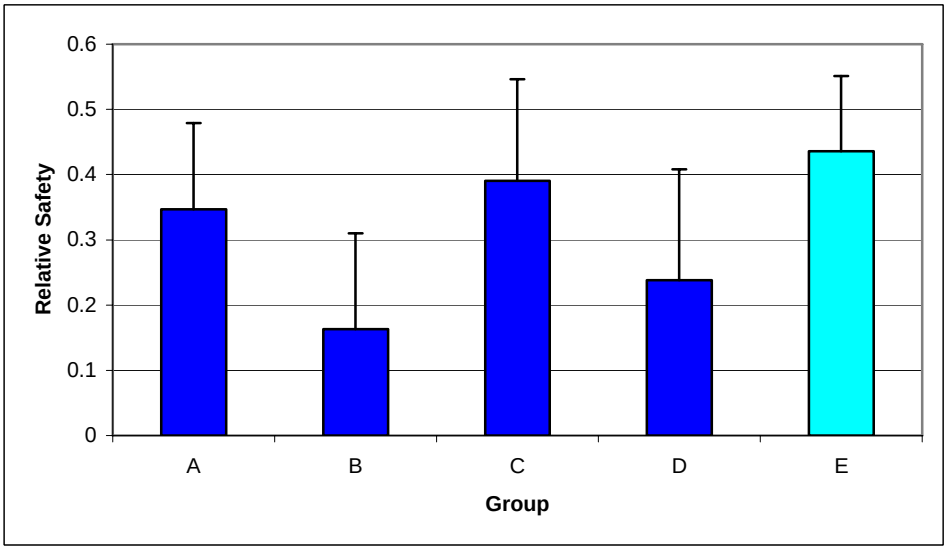


Figure 37: Mean relative ratings of driving safety when fatigued, for each of the 5 groups.

Significant self-enhancing bias was evident ($t_{.05,\ 224}$= 4.87, p<.001).

The “no message” control group tended to demonstrate stronger self-enhancing bias than did the “message” groups, but none of the planned contrasts was significant (all p’s > .19).

Figure 38 presents the mean relative ratings of the ability to drive safely when not fatigued, for each of the 5 groups.

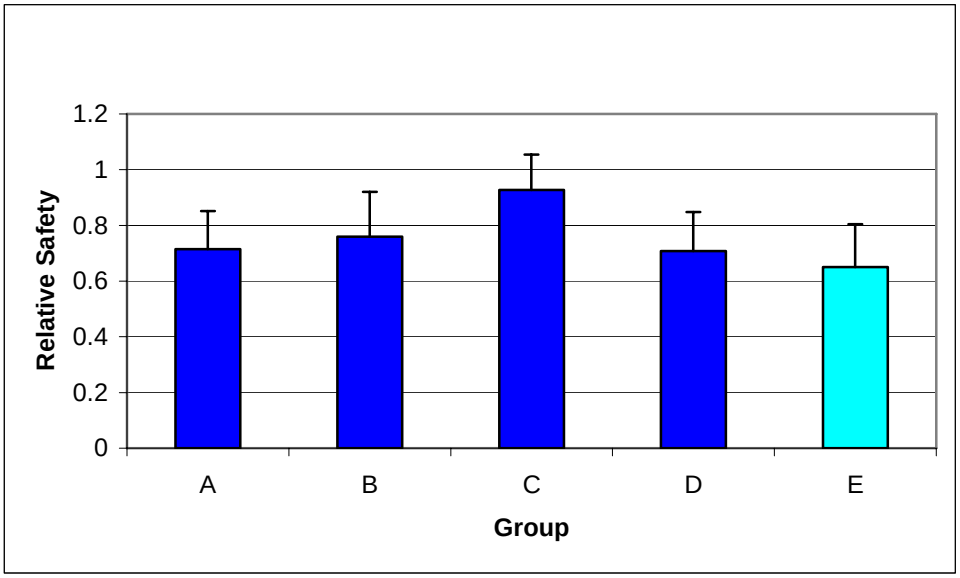


Figure 38: Mean relative ratings of driving safety when not fatigued, for each of the 5 groups.

Significant self-enhancing bias was evident ($t_{.05,\ 223}$= 11.62, p<.001).

The "no message" control group tended to demonstrate weaker self-enhancing bias than did the "message" groups, but no planned comparison was significant (all p's > .20).

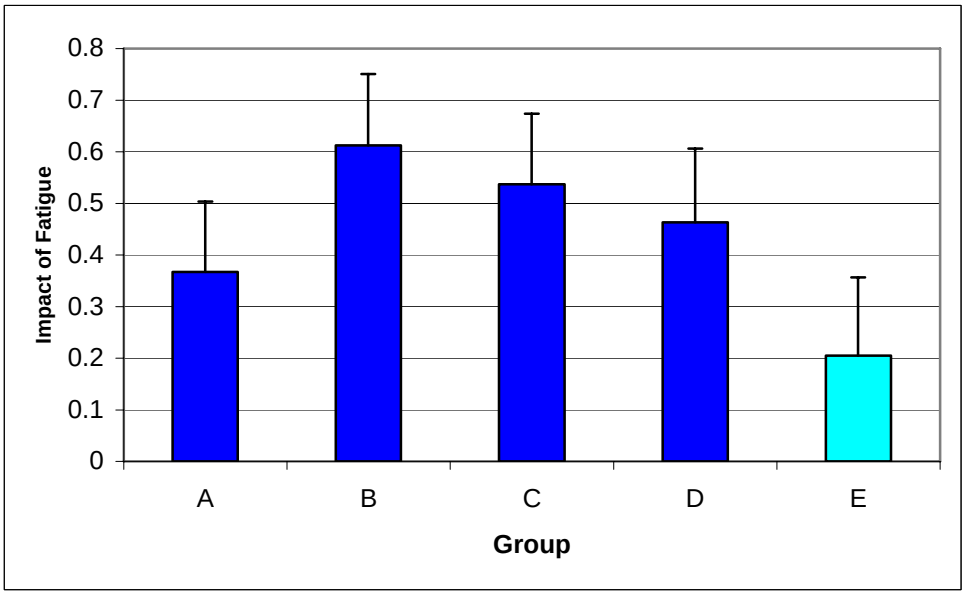


Figure 39: Mean difference between relative ratings of driving safety when fatigued vs. when not fatigued, for each of the 5 groups.

The relative ratings of driving safety when fatigued were subtracted from the relative ratings of driving safety when not fatigued to index the impact of fatigue on self-enhancing bias regarding driving safety [see Figure 39].

The “no message” control group tended to demonstrate a weaker impact of fatigue on self-enhancing bias regarding driving safety than did the “message” groups, but none of the planned contrasts was significant (all p’s >.11)

Figure 40 presents the mean relative ratings of driving skill when fatigued, for each of the 5 groups.

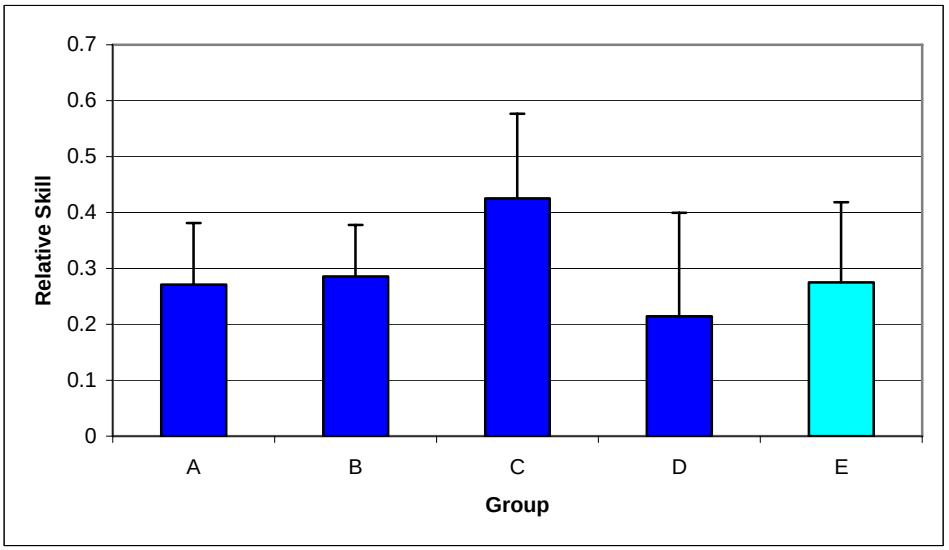


Figure 40: Mean relative ratings of driving skill when fatigued, for each of the 5 groups.

Significant self-enhancing bias was evident ($t_{.05,\ 224}$=4.79, p<.001).

None of the planned comparison was significant (all p’s > .45).

Figure 41 presents the mean relative ratings of driving skill when not fatigued, for each of the 5 groups.

Significant self-enhancing bias was evident ($t_{.05,\ 224}$= 11.60, p<.001).

None of the planned comparison was significant (all p’s > .58).

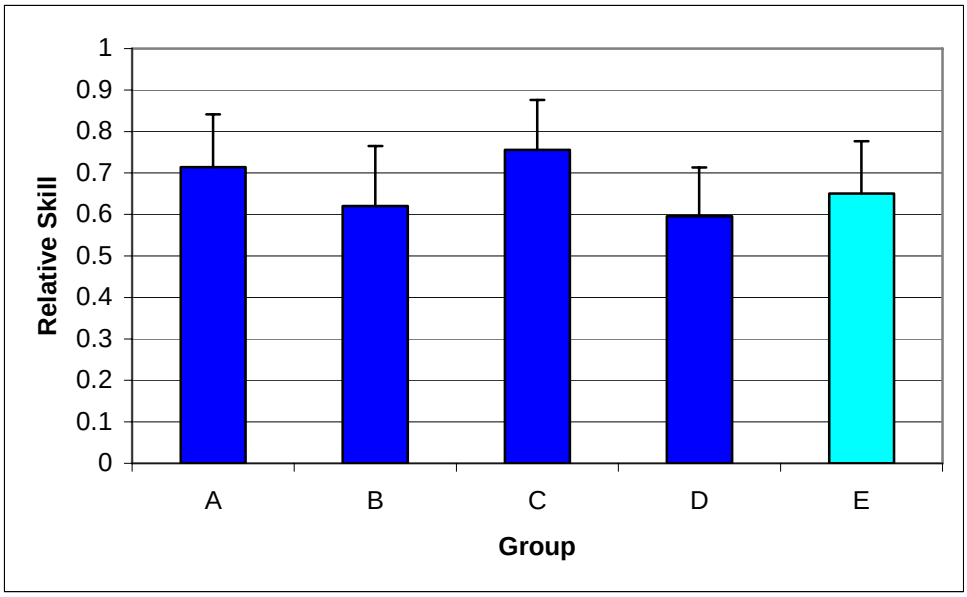


Figure 41: Mean relative ratings of driving skill when not fatigued, for each of the 5 groups.

The relative ratings of driving skill when fatigued were subtracted from the relative ratings of driving skill when not fatigued to index the impact of fatigue on self-enhancing bias regarding driving skill [see Figure 42].

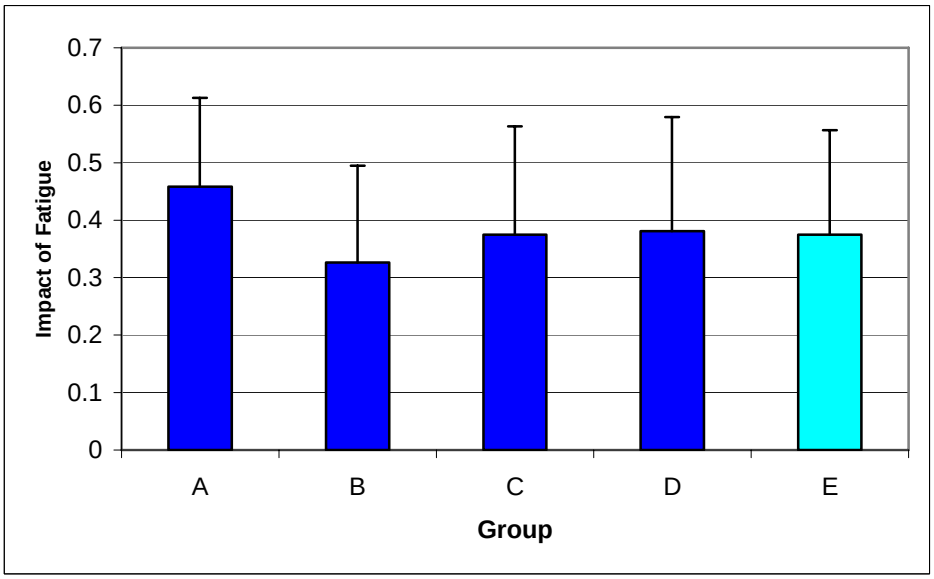


Figure 42: Mean difference between relative ratings of driving skill when fatigued vs. when not fatigued, for each of the 5 groups.

None of the planned contrasts was significant (all p's >.74).

Figure 43 presents the mean relative ratings of driving experience, for each of the 5 groups.

Significant self-enhancing bias was evident ($t_{.05,\ 223}$= 6.83, p<.001).

None of the planned comparison was significant (all p's > .20).

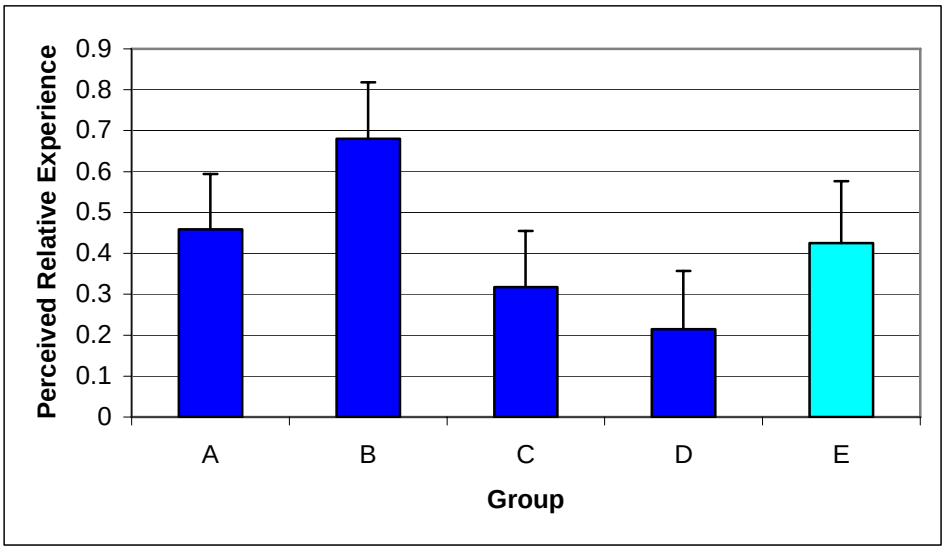


Figure 43: Mean relative ratings of driving experience, for each of the 5 groups.

Techniques used to avoid driving whilst fatigued

The "Debunking common myths" Section (given to Groups C and D) emphasised that crash risks could not be reduced through: getting some breeze, chatting, listening to music, and using caffeine. In addition, all messages included the statement "A lot of people use strategies to keep driving when they are tired. None work. If you are fatigued while you are driving, the only thing you can do to ensure that you don't crash is stop and rest".

Figure 44 presents the mean ratings of the likelihood of using each of 11 techniques in future "to get through a drive if feeling fatigued", for each of the 5 groups. Responses were made on a scale from 1 (definitely not) to 5 (definitely). The only one of the techniques that is appropriate is "stop on the side of the road and have a rest".

The "no message" control group rated their likelihood of "turning the music up or singing" significantly higher than did Groups C and D (for both $t_{.05,\ 218} = -2.449$, p=.015). There was no significant difference between Groups C and D ($t_{.05,\ 218}=0.000$, p=1.00). The "no message" group also tended to give higher ratings than Groups A and B, although the relevant planned comparisons were not significant (all p's >.76).

The "no message" control group rated their likelihood of "taking drugs to keep awake or alert" significantly higher than did D ($t_{.05,\ 220}=-2.105$, p=.036). The "no message" group also tended to give higher ratings than Groups A, B, and C, although the relevant planned comparisons were not significant (all p's >.21).

The "no message" group also tended to give higher ratings than all "message" groups for "chew gum or eat whilst driving", although none of the planned comparisons were significant (for comparison with Group D: p=.096; all other p's >.46).

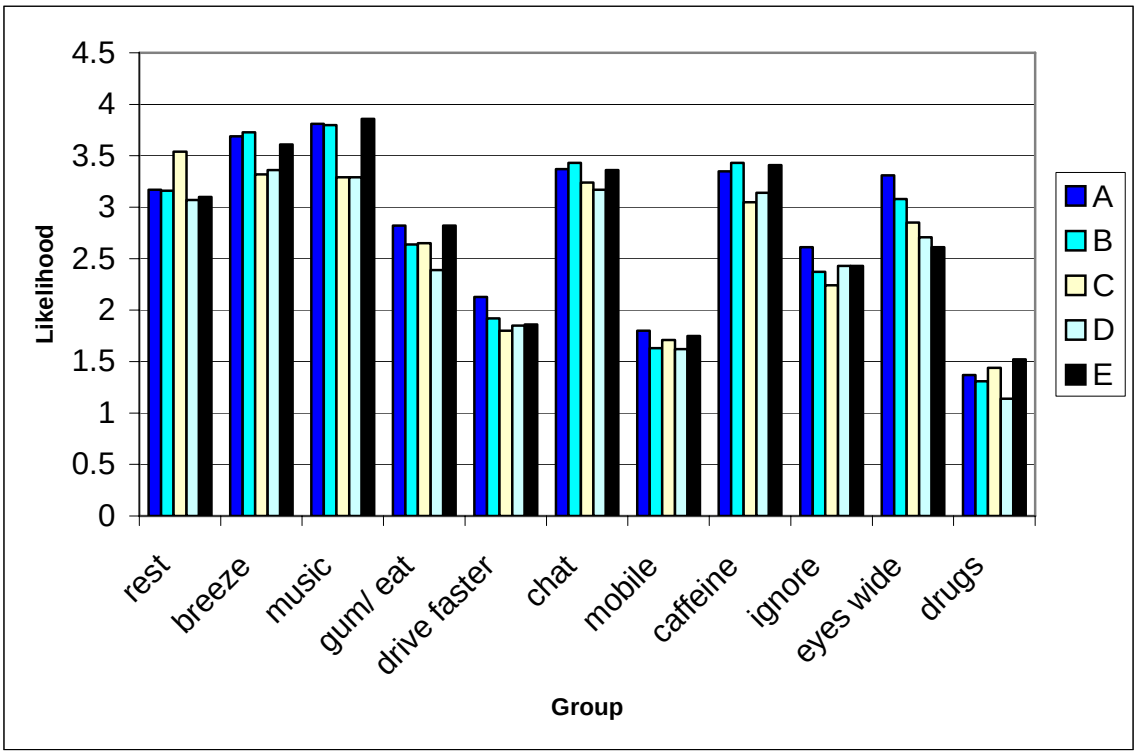


Figure 44: Mean ratings of the likelihood of using each of 11 techniques "to get through a drive if feeling fatigued" in future, for each of the 5 groups.

No planned comparison was significant for "wind window down and feel the breeze", "drive faster", "chat with others in the car", "talk on a mobile phone", "drink or take caffeine"", or "try to ignore it or think about other things" (all p's >.15).

The "no message" control group rated their likelihood of "trying to keep eyes wide open" *lower* than did Group A ("Basic information" only; $t_{.05,\ 220}$=2.802, p=.006). No other planned comparison was significant, although the control group tended to demonstrate ratings *lower* than all other groups, and the p-value (.060) for the comparison with Group B was low (p=.060; all other p's >.35).

For the one appropriate behaviour, "stop on the side of the road and have a rest", the comparison with Group C approached significance ($t_{.05,\ 220}$=1.742, p=.083; all other p's >.76).

Ability to drive without becoming fatigued

In order to combat the common misperception that driver fatigue is not a problem on short drives, all messages identified that driver fatigue "is determined by more than just the amount of time you have been driving" and the "Debunking common myths" Section (given to Groups C and D) identified that "driver fatigue is not only a problem that happens on long drives".

Figure 45 presents mean number of minutes respondents thought they could drive before becoming fatigued.

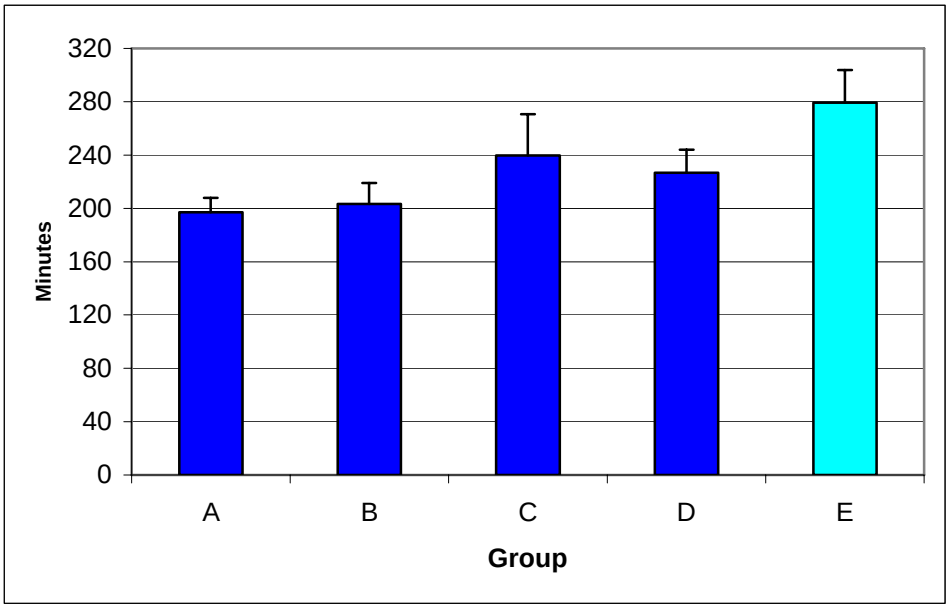


Figure 45: Mean number of minutes respondents thought they could drive before becoming fatigued.

The "no message" control group estimated a significantly higher number of minutes than did Group A ($t_{.05,\ 221}$=-2.918, p=.004) and Group B ($t_{.05,\ 221}$=-2.687, p=.008). There was no significant difference between Groups A and B ($t_{.05,\ 221}$=-.225, p=.822).The tendency for the "no message" control group to estimate a higher number of minutes than did Groups C and D was not significant ($t_{.05,\ 221}$=-1.338, p=.182; $t_{.05,\ 221}$=-1.783, p=.072, respectively).

Relative estimates were computed by subtracting average peer estimates from self estimates (so that a more positive mean relative rating reflects greater self-serving bias). The "no message" control group demonstrated a significantly stronger self-serving bias than did Group B ($t_{.05,\ 206}$=-2.726, p=.007; 48.17 vs. =4.17). The control group also tended to demonstrate a significantly stronger self-serving bias than all other "message" groups, although no relevant planned comparison was significant (all p's >.22; Group A mean=25.11, Group C mean=25.88, Group D mean=23.63).

Figure 46 presents the mean ratings of the chance of becoming fatigued while driving short distances, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

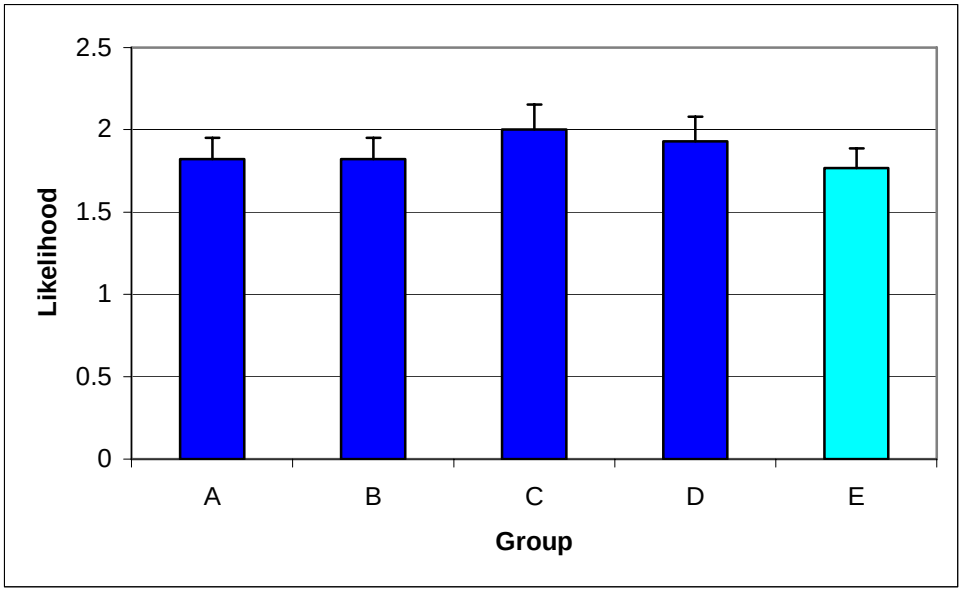


Figure 46: Mean ratings of the chance of becoming fatigued while driving short distances, for each of the 5 groups.

The “no message” control group tended to rate their chances lower than did the “message” groups, but no planned comparison was significant (all p’s > .24). Thus, the perceived risks of becoming fatigued on long drives appears to have been maintained.

Figure 47 presents the mean ratings of the chance of becoming fatigued while driving long distances, for each of the 5 groups. Responses were made on a scale from 1 (very low) to 5 (very high).

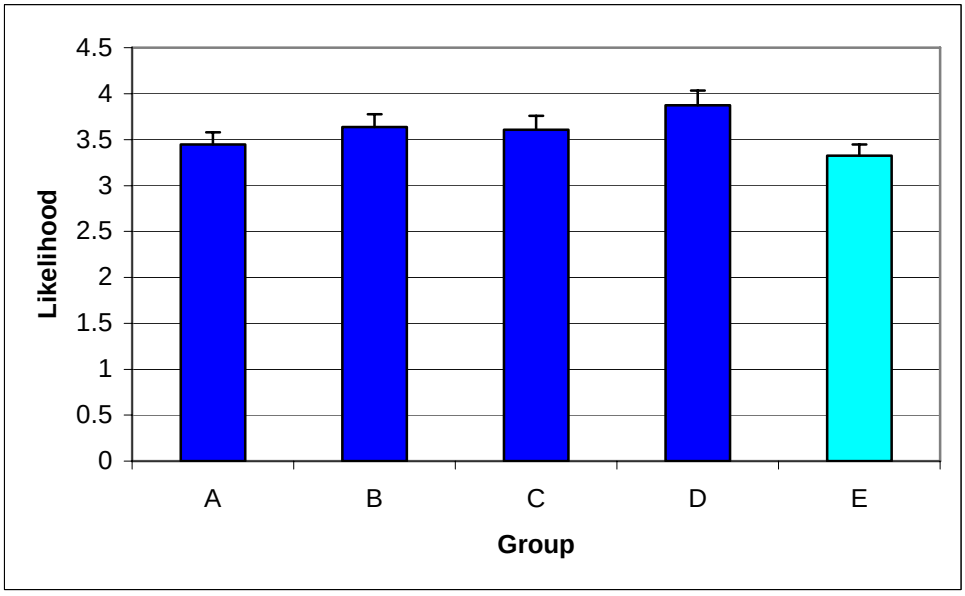


Figure 47: Mean ratings of the chance of becoming fatigued while driving long distances, for each of the 5 groups.

The “no message” control group rated their chances significantly lower than did Group D (all materials) ($t_{.05, 219}$=2.69, p=.008). The control group also tended to give lower ratings that the other “message” groups, but no further planned comparison was significant (all p’s >.10).

Relative ratings were computed by subtracting average peer ratings from self ratings (so that a more negative mean relative rating reflects greater optimism bias).

Figure 48 presents the mean relative ratings of the chance of becoming fatigued while driving short distances, for each of the 5 groups.

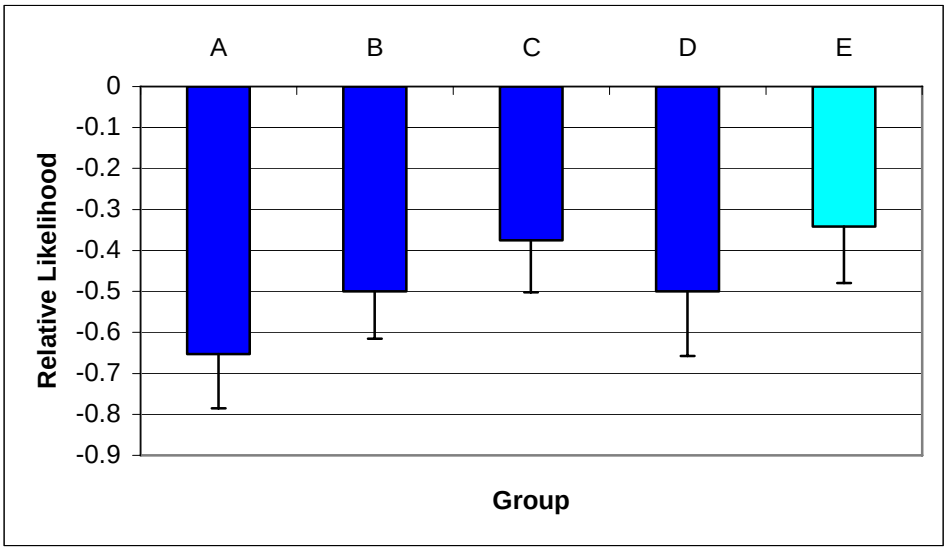


Figure 48: Mean relative ratings of the chance of becoming fatigued while driving short distances, for each of the 5 groups.

The “no message” control group tended to demonstrate weaker self-serving bias than the “message” groups, but no planned comparison was significant (all p’s > .10).

Figure 49 presents the mean relative ratings of the chance of becoming fatigued while driving long distances, for each of the 5 groups.

The “no message” control group demonstrated significantly weaker self-serving bias than Group A (“Basic information” only; $t_{.05, 215}$=-2.557, p=.011). The “no message” group also tended to demonstrate significantly weaker self-serving bias than the other “message” groups, but no further planned comparison was significant (all p’s > .17).

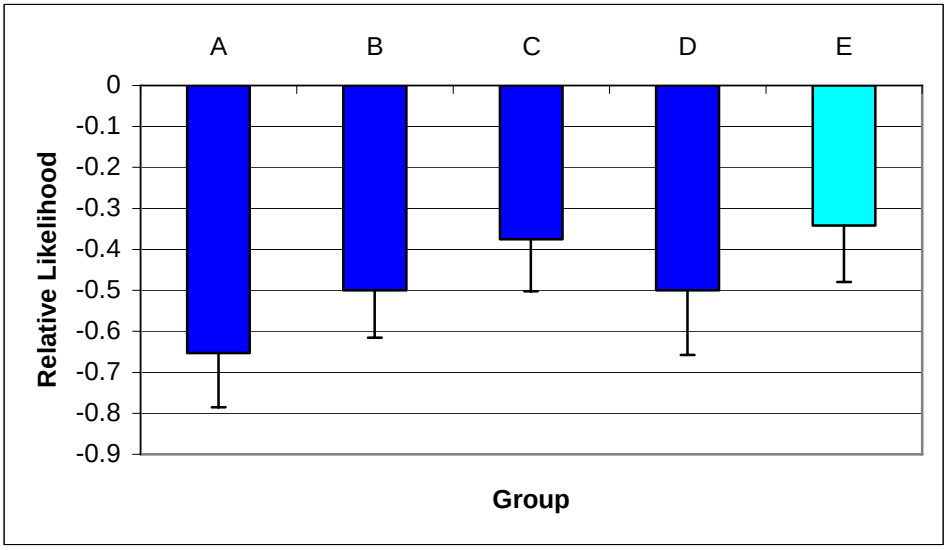


Figure 49: Mean relative ratings of the chance of becoming fatigued while driving long distances, for each of the 5 groups.

Normative attitudes toward driving whilst fatigued

Social censure of driving whilst fatigued was not directly addressed in the anti-fatigue messages, however the anti-fatigue messages appeared to increase perceived crash risk of driving whilst fatigued (see Section “Crash risk of driving while fatigued”), they may also increase social censure of this behaviour.

Figure 50 presents mean normative rating scores a 1) “driving whilst fatigued, tired, or worn out”; and 2) “pulling over to the side of the road when feeling tired”, where safe = 1, sensible= 2, a waste of time= 3, silly= 4 and dangerous= 5, for each of the five groups. Figures 51 presents the same information in relation to respondents’ expectations about their parents’ descriptions (the graph for friends’ descriptions was almost identical and is not included).

None of the planned comparisons was significant for personal descriptions of “driving whilst fatigued, tired, or worn out” (all p’s >.32), friends’ descriptions (all p’s > .23), or parents’ descriptions (all p’s >.27). However, scores were high in the “no message” control group (4.2-4.5 out of a possible score of 5), suggesting a “ceiling effect”.

None of the planned comparisons was significant for personal descriptions of “pulling over to the side of the road when feeling tired” (all p’s >.09), friends’ descriptions (all p’s > .19), or parents’ descriptions (all p’s >.14).

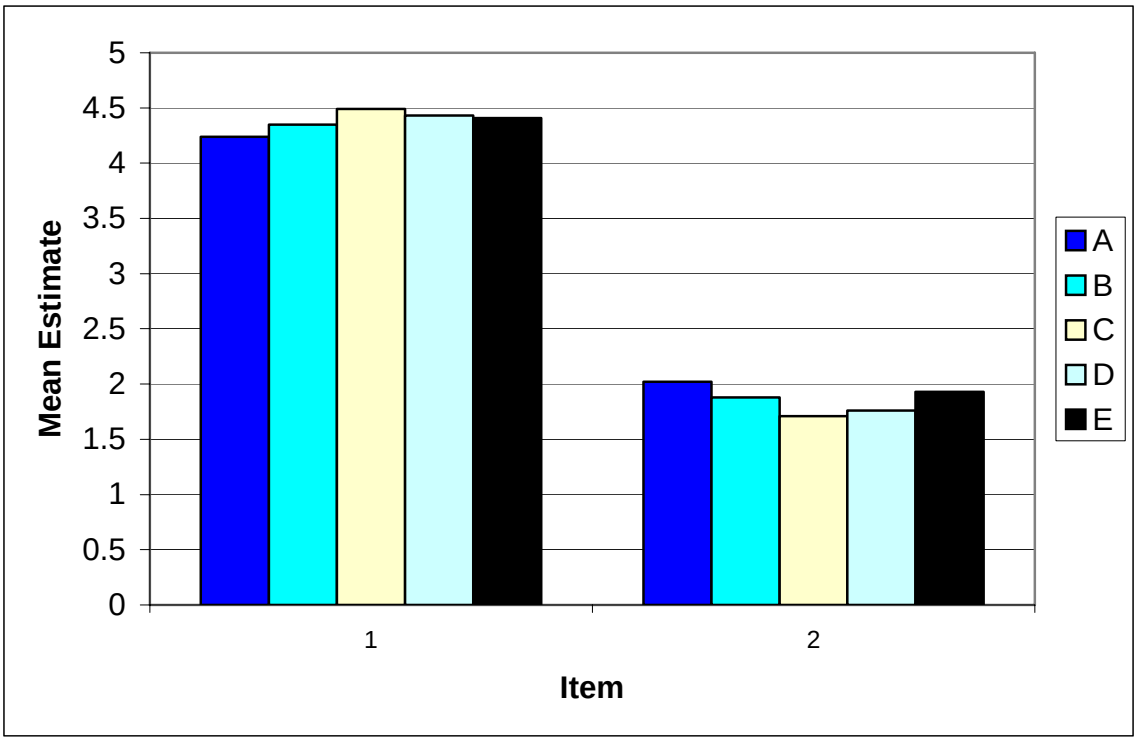


Figure 50: Mean estimates of respondents' descriptions of 1) "driving whilst fatigued, tired, or worn out"; and 2) "pulling over to the side of the road when feeling tired", for each of the 5 groups.

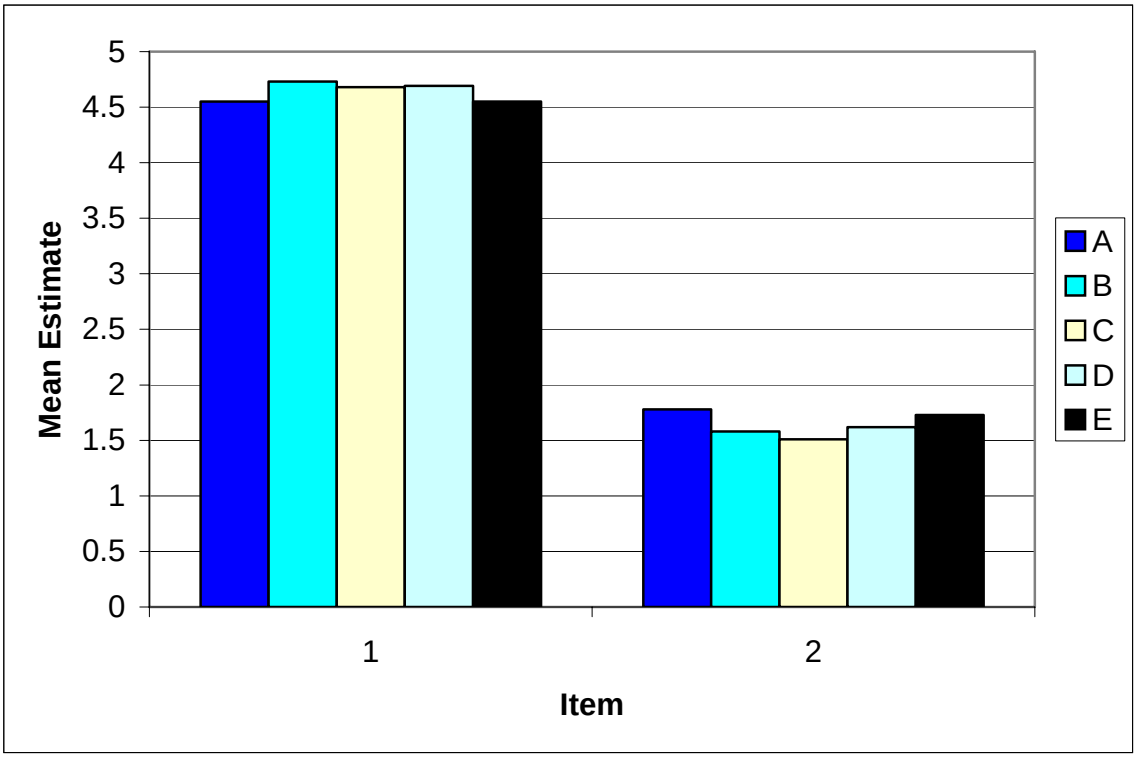


Figure 51: Mean estimates of parents' descriptions of 1) "driving whilst fatigued, tired, or worn out"; and 2) "pulling over to the side of the road when feeling tired", for each of the 5 groups.

Current & intended frequency of driving whilst fatigued, & associated factors

The ultimate aim of the anti-fatigue messages was to reduce rates of driving whilst fatigued (via by changing beliefs and attitudes, and recommending appropriate behaviours). In the context of the present research program intended behaviour was taken as a convenient and efficient proxy for actual behaviour.

Respondents rated frequency of *current* driving whilst fatigued [see Figure 52]. Response options were: 0= never, 1= less than once a month, 2= once or twice a month, 3= once or twice a week, and 4= three or more times a week.

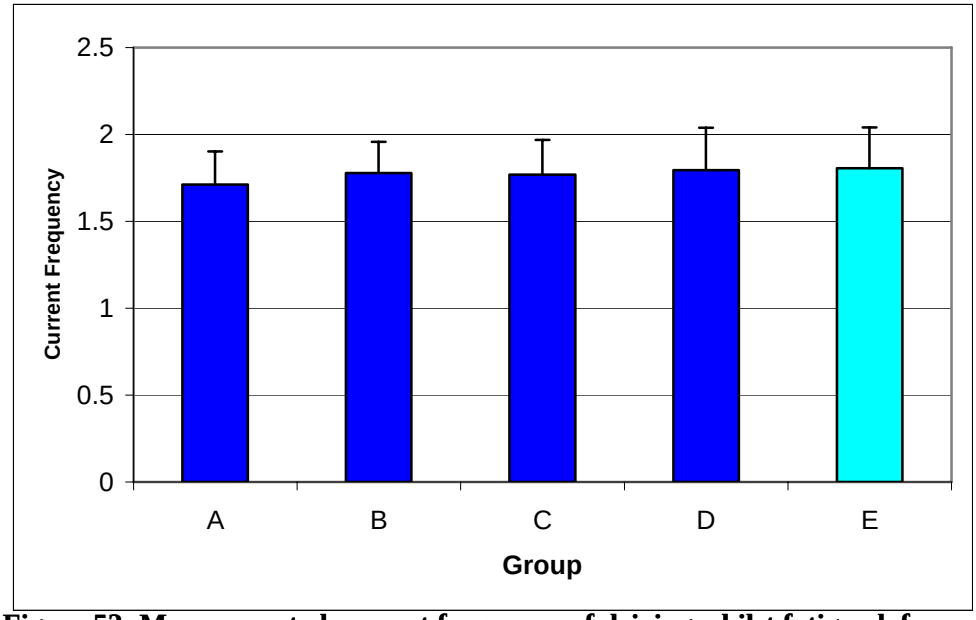


Figure 52: Mean reported current frequency of driving whilst fatigued, for each of the 5 groups.

The “no message” control group tended to report more frequent current driving whilst fatigued than the “message” groups to drive whilst fatigued, but no planned comparison was significant (all p’s > .74).

Respondents also estimated the intended frequency of driving whilst fatigued for themselves in each of 4 situations, on a scale from 0%= Never to 100%= Always. Figures 53 – 56 present the mean frequency for each situation, for each of the 5 groups. The usual planned comparisons were employed to analyse responses to these questions, and then repeated employing current frequency of driving whilst fatigued as a covariate.

The “no message” control group reported significantly stronger intentions to continue driving despite feeling fatigued than did Group C ($t_{.05,\ 219}$=-2.005, p=.046). The control group also tended to report stronger intentions than the other message groups, but none of the relevant planned contrasts was significant (all p’s >.12).

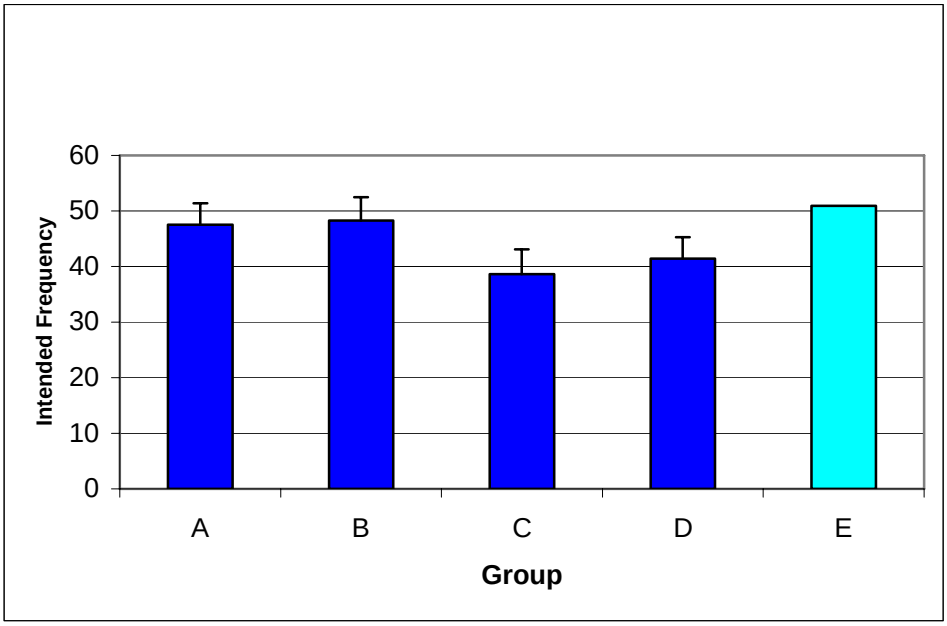


Figure 53: Mean reported intended frequency of continuing to drive despite feeling fatigued, for each of the 5 groups.

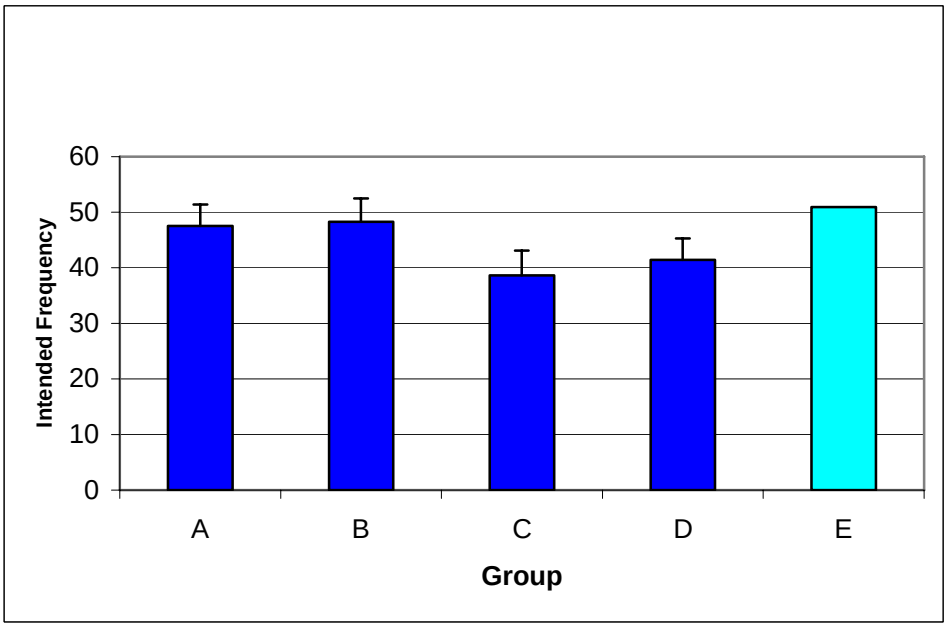


Figure 54: Mean reported intended frequency of driving for 3 hours without a break, for each of the 5 groups.

The “no message” control group tended to report stronger intentions to drive for 3 hours without a break than all of the “message” groups (except Group A), but none of the basic planned comparisons were significant (all p’s >.1).

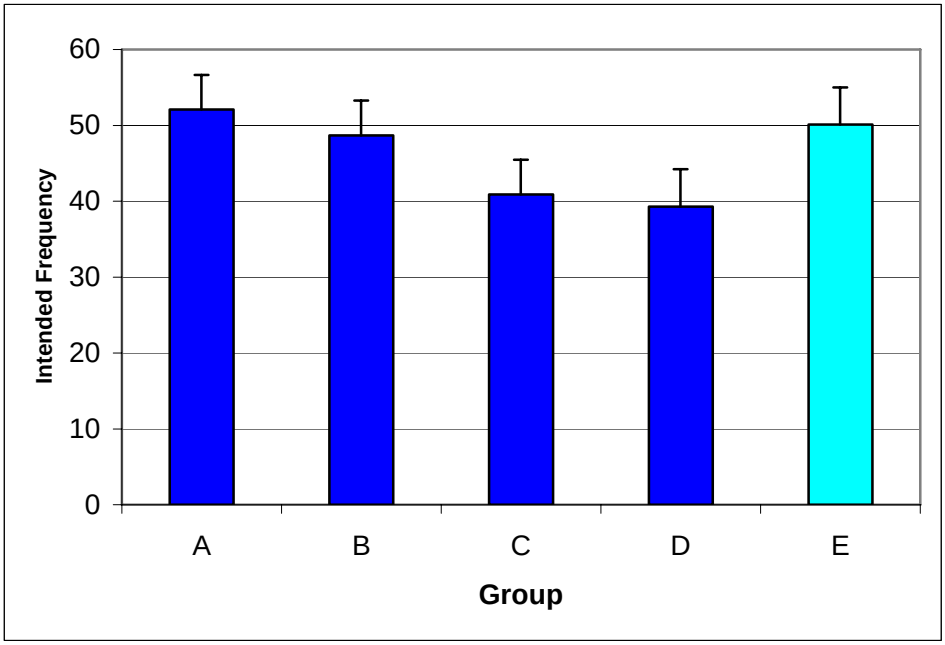


Figure 55: Mean reported intended frequency of driving past a Driver Reviver Stop despite driving for 2 hours or more (or being aware of fatigue), for each of the 5 groups.

The "no message" control group tended to report stronger intentions to drive past a Driver Reviver Stop despite driving for 2 hours or more (or being aware of fatigue) than all of the "message" groups (except Group A), but none of the basic planned comparisons were significant (all p's >.10).

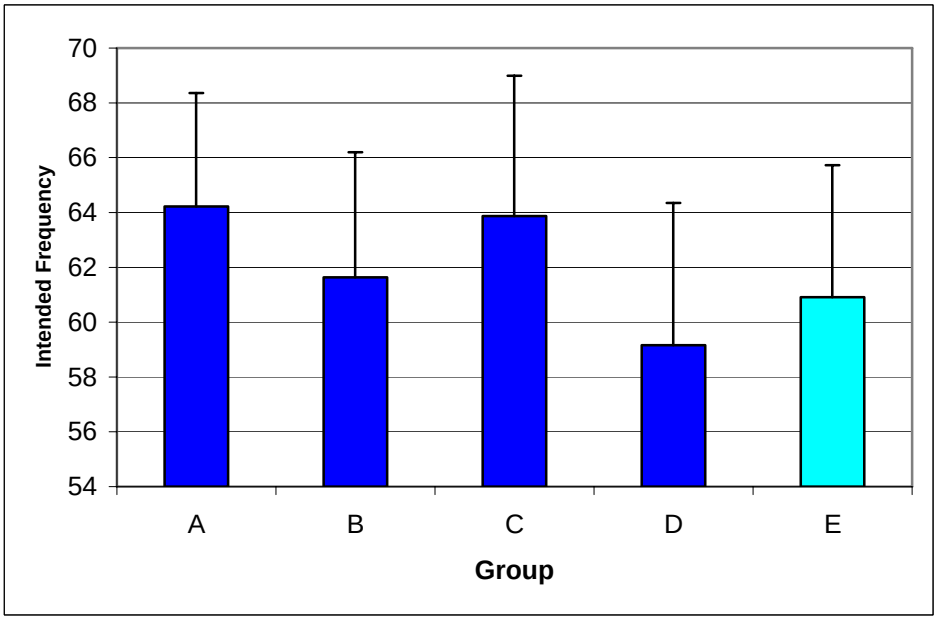


Figure 56: Mean reported intended frequency of driving after less than 5 hours sleep, for each of the 5 groups.

The “no message” control group did not differ from any of the message groups in reported intentions to drive after less than 5 hours sleep (all p’s>.615).

The pattern of results was unchanged when the analysis was repeated with current behaviour as a covariate.

Evaluation of intervention materials

Respondents in the message groups reported that the intervention materials were on average ‘very’ readable (M=4.06), ‘moderately’ interesting (M=3.1) and between ‘moderately’ and ‘very’ personally relevant (M=3.41).
Because each group received different materials [see Tables 9 and 10], Group A responses to these questions were compared to each of Group B, C, and D, separately. No significant differences were observed for readability (lowest non-significant p=.051, suggesting that the Group B materials were found more readable than the simpler Group A materials; all other p’s> .10), interest (lowest non-significant p=.06, suggesting that the Group D materials were found more interesting than the simpler Group A materials; all other p’s >.60), or personal relevance (all p’s >.21).

Summary of evaluation of anti-fatigue messages

Overall, the anti-fatigue message appears to have promise as a means of reducing the rate of driving whilst fatigued amongst young drivers.

The anti-fatigue messages produced 8 desirable changes (relative to "no message" controls) [see Table 13].

Table 13: 8 significant desirable changes produced by anti-fatigue messages (relative to "no message" controls)

Type of variable	Effect	Group showing effect
Crash risk	Increased perceived chance of having a crash when fatigued	Groups A and B (with tendency in Groups C and D)
	Reduced optimism bias regarding crashing when *not* fatigued	Group B (with tendency in Groups C and D)
Intention to perform appropriate and inappropriate fatigue-combating behaviours	Reduced intended frequency of "turning the music up or singing" to combat fatigue	Groups C and D (with tendency in Groups A and B)
	Reduced intended frequency of "taking drugs to keep awake or alert"	Group D (with tendency in Groups A, B, and C)
Myths	Reduced estimated number of minutes driving before becoming fatigued	Groups A and B (with tendency in Groups C and D, and in Group D p=.072)
	Reduced self-enhancing bias regarding number of minutes driving before becoming fatigued	Group B (with tendency in Groups A, C, and D)
	Increased perceived chance of becoming fatigued on long drives	Group D (with tendency in Groups A, B, and C)
Intention to drive whilst fatigued	Reduced intended frequency of continuing to drive despite fatigue	Group C (with tendency in Groups A, B, and D)

In addition, p-values were low for increased intended frequency of "stop on the side of the road and have a rest" to combat fatigue in Group C (p=.083), and for reduced intended frequency of "chewing gum or eating" to combat fatigue in Group D (p=.096). These effects would have been significant had a one-tailed test been employed, and may have reached significance in a larger sample.

All 4 message groups differed *non-significantly* from the control group in a consistent direction toward desirable change was observed for 8 further outcomes [see Table 14].

Table 14: 8 *nonsignificant* tendencies for desirable changes produced by anti-fatigue messages (relative to "no message" controls)

Type of variable	Effect
Crash risk	Increased perceived chance of being pulled over by police for negligent driving due to fatigue
	Increased perceived impact of fatigue on driving safety
	Reduced optimism bias regarding crashing when fatigued
	Reduced optimism bias regarding crashing when speeding
	Reduced self-enhancing bias regarding driving safety when fatigued
	Increased perceived impact of fatigue on self-enhancing bias regarding driving safety
Intention to perform appropriate and inappropriate fatigue-combating behaviours	Reduced intended frequency of "chewing gum or eating" to combat fatigue
Myths	Increased perceived chance of becoming fatigued on short drives

Some of these effects may have reached significance in a larger sample.

Only 2 significant undesirable changes were observed, both in Group A:

- increased intended frequency of "trying to keep eyes wide open" to combat fatigue only in Group A
- increased self-enhancing bias regarding chance of becoming fatigued on long drives only in Group A (but tendency in other groups also)

In addition, there appeared to be a non-significant tendency toward undesirable changes in 5 further variables (optimism bias regarding chance of being pulled over by police, driving safety when *not* fatigued, self-enhancing bias regarding driving safety when *not* fatigued, self-enhancing bias regarding number of minutes driving before becoming fatigued self-enhancing bias regarding chance of becoming fatigued on short drives).

Given the large number of planned comparisons conducted, some would be expected to be significant by chance. However, the pattern of results suggests a real positive impact of the messages. We treat analyses relating to perceived crash risk, intentions to perform appropriate and inappropriate fatigue-combating behaviours, support of myths, and

intentions to drive whilst fatigued as separate families of tests (in addition to a few variables which do not clearly belong to any of these families). Within each family the number of effects that suggested a positive impact of the messages matches or exceeds chance levels. Of 56 tests directly relating to crash risk (excluding questions on perceived driving safety, skill, and experience), only 2 could have been expected to be significant by chance. Thus, a finding of 3 significant effects and 12 *nonsignificant* differences in a consistent direction suggested a real positive impact of the messages. There were no tests directly relating to perceived crash risk that suggested a negative impact of the messages. It is unsurprising that beliefs about crashing when not fatigued were influenced by the messages, which also mentioned drink-driving and speeding. In particular, speeding was shown by the "Risk ladder" to be associated with more crashes amongst young drivers than driving whilst fatigued. There were 48 tests relating to intentions to perform fatigue-combating behaviours, of which 2 could have been expected to be significant by chance. 3 significant effects, 2 near-significant effects ($p<.096$), and 6 *nonsignificant* differences in a consistent direction suggested a real positive impact of the messages. Only 1 significant effect relating to intentions to perform appropriate and inappropriate fatigue-combating behaviours suggested a negative impact of the messages. The 24 tests regarding the perceived relationship between driving time and fatigue could have been expected to produce 1 significant effect by chance. 4 significant effects, 1 near-significant effect ($p=.072$), and 11 *nonsignificant* differences in a consistent direction suggested a real positive impact of the messages. Only 1 significant effect and 4 *nonsignificant* differences in a consistent direction suggested a negative impact of the messages on support of myths There were 20 tests relating to intentions to drive whilst fatigued, of which 1 could have been expected to be significant by chance. 1 significant effect was observed to suggest a positive impact of the messages. No tests relating to intentions to drive whilst fatigued suggested a negative impact of the messages. Four additional variables (which do not clearly belong to any of these families) each demonstrated 4 *nonsignificant* differences in a consistent direction suggesting a positive impact of the messages (increased perceived chance of being pulled over by police for negligent driving due to fatigue; increased perceived impact of fatigue on driving safety; reduced self-enhancing bias regarding driving safety when fatigued; increased perceived impact of fatigue on self-enhancing bias regarding driving safety). 4 *nonsignificant* differences in a consistent direction for each of optimism bias regarding chance of being pulled over by police, driving safety when *not* fatigued, self-enhancing bias regarding driving safety when *not* fatigued.

Almost all of the variables considered could have been expected to demonstrate changes across all of the groups, but in some cases the effects might have been enhanced for particular groups. The "basic message" addressed perceived fatigue-related crash risk, inappropriate and appropriate fatigue-combating techniques, and myths regarding contributing factors (including driving time) to some extent. Effects might have "transferred" to some extent to perceived crash risk of speeding and drink-driving, perceived driving safety and skill, and social norms regarding driving whilst fatigued (and other risky driving behaviours). Because Groups B and D received the "Risk ladder" designed to aid interpretation of crash statistics, any effects on crash risk (and associated outcomes) might have been enhanced in these Groups. Because Groups C and D received the "Debunking common myths" information any effects on beliefs about inappropriate fatigue-combating behaviours and myths regarding contributing factors might have been enhanced in these groups.

Group B appeared to demonstrate the most favourable change with regard to perceived crash risk, demonstrating 2 significant improvements (relative to controls) in this area, compared to 1 in Group A.

Both Groups C and D demonstrated favourable changes with regard to beliefs about inappropriate fatigue-combating behaviours and myths regarding contributing factors. Group C demonstrated 2 significant changes in this area, and 1 near-significant change. Group D demonstrated 3 significant and 2 near-significant changes.

On balance, the results suggest that the full suite of materials (given to Group D) are the best of those considered. The “basic message” given to Group A produced two significant undesirable changes (increased intention to trying to keep eyes wide open” to combat fatigue, and increased self-enhancing bias regarding the chance of becoming fatigued on long drives). Further, for the two outcomes in which Group A demonstrated a significant improvement (increased perceived chance of having a crash when fatigued, and reduced estimated number of minutes driving before fatigued), Group B also demonstrated a significant improvement (and the two groups did not differ). Group D performed best in terms of beliefs about inappropriate fatigue-combating behaviours and myths regarding contributing factors. Although Group C performed best in terms of intention to continue driving despite fatigue, they did not receive the “Risk ladder” which appeared to produce improvements in Group B. Further Group D appeared to have a tendency to perform “better” (not significance tested) than Group C in terms of perceived crash risk.

However, the tendency for Group D to perform “worse” (not significance tested) than Group B in terms of perceived crash risk might be addressed by further research. Perhaps adding the “Debunking common myths” Section suggested to respondents that by behaving appropriately crash risks would be reduced. This would in fact offer reinforcement for an intention to behave appropriately. Alternatively, with the addition of the “Debunking common myths” Section the messages may have become too long for respondents to retain the earlier information about crash risks. Future research could refine the messages to investigate these possibilities.

Given that “message” group participants completed questionnaires immediately after reading the anti-fatigue messages the apparent improvement in their beliefs, attitudes and intended behaviours may reflect a demand characteristic. Several findings of the present research speak against this interpretation. First, Study 1 respondents did not appear to respond in a deliberately socially desirable fashion (see discussion of Study 1), Study 2 respondents did not differ markedly from Study 1 respondents, and demand characteristics are essentially a form of socially desirable response. Therefore, Study 2 responses are unlikely to reflect demand characteristics. Second, several of the observed effects would be difficult for respondents to predict as a hope of the researcher, and difficult for respondents to “fake”. For example, optimism bias regarding chance of crashing when *not* fatigued (which was reduced in Group B relative to controls), did not relate directly to fatigue (although the message appeared to), and was computed from two independent scores (neither of which demonstrated a significant effect of the messages). Finally, instructions were designed to minimise demand characteristics.

Participants reported finding the messages readable, interesting and personally relevant. Further, increasing the length and complexity of the messages did not appear to reduce their appeal.

The present results speak for the value of contextualising risk information, and for explicitly addressing current beliefs. The efficacy of the materials may also have been promoted by the use of links with existing road safety campaigns. For example, the statement “You know you shouldn’t let a friend drink and drive, so why should you let them… drive while fatigued?” harnesses advertising that appears to have been effective in the area of drink driving. We suspect that the graphical presentation of risk information not only aided understanding, but helped to make the materials interesting.

Overall, the full anti-fatigue message that was given to Group D appears to have promise as a means of reducing the rate of driving whilst fatigued among young drivers.

Acknowledgements

The authors gratefully acknowledge the Motor Accidents Authority for funding this research project.

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Appendix A

Number	Name in phone book	Phone book page number	Result	Final call back result

RESULTS:
S – Successful interview.
NO A – No answer, engaged, or answering machine. Three calls back required, preferably over two days, and separated by at least one hour. Only record NO A after all calls back.
NO L – Out of range: no licensed driver or rider lives at residence.
NO E – Out of range person answering, or target person has insufficient English. If latter case, terminate interview with appropriate excuse (e.g. you are not in our age range, thank you anyway).
Wrong age – No driver living there is the appropriate age.
Refuse A – Person answering refused to proceed further so you cannot establish contact with a target person. If person answering is a child and you cannot get them to understand, call back later.
Refuse T – Target person refused.
Target person not available/not home – call back later. Do not replace within the household. No code until have done all calls back. Then code final result.
UN T – After all calls back, selected target person not available.

Appendix B

Good morning / Afternoon / Evening. My name is _____ and I am conducting a survey on attitudes to driving for the University of Sydney. I would like to speak to a person at this address aged between 17 and 25 years who holds a current driver's license.

Once the right person comes to the phone:

Good morning / Afternoon / Evening. My name is _____ and I am conducting a survey on attitudes to driving for the University of Sydney. Could you spare just 15 minutes?

To begin, could I ask how old you turned on your last birthday? _____ years

PART ONE

Question 1: People often have different opinions about what causes serious road crashes. What would you say are the 3 most common causes of serious road crashes involving young drivers, beginning with the most common?

Most common: _____

Second most common: _____

Third most common: _____

Question 2:

(a) Of all serious crashes involving young drivers last year, what percentage do you think would have been caused by driver fatigue? _____%
(b) How about speeding? _____%
(c) How about drink driving? _____%
(d) How about inexperience on the road? _____%
(e) How about poor road conditions? _____%
(f) How about using a mobile phone? _____%

When answering questions throughout the rest of this survey, I would like you to remember that "fatigue" means feeling fatigued *or* tired.

Question 3: People can experience fatigue in different ways. How does your body react when you are beginning to feel fatigued while driving?

Can select <u>more</u> than one response

Sore eyes	YES	NO
Headaches	YES	NO
Heavy eyelids	YES	NO
Slower reflexes	YES	NO
Nodding off at the wheel	YES	NO
Hard to concentrate	YES	NO
Feeling bored	YES	NO
You experience a microsleep	YES	NO
Can't see very well	YES	NO
Oversteering	YES	NO

Any others? (Please specify): _____

Question 4:

(a) How often do **you** drive whilst fatigued or tired? Is it…

- ❑ Three or more times a week
- ❑ Once or twice a week
- ❑ Once or twice a month
- ❑ Less than once a month
- ❑ Never

(b) How often would you say the **average driver** drives whilst fatigued? Is it…

- ❑ Three or more times a week
- ❑ Once or twice a week
- ❑ Once or twice a month
- ❑ Less than once a month
- ❑ Never

(c) How often would you say the **average driver of the same age and sex as you** would drive whilst fatigued? Is it…

- ❑ Three or more times a week
- ❑ Once or twice a week
- ❑ Once or twice a month
- ❑ Less than once a month
- ❑ Never

Question 5:

(a) Have you ever had a crash when driving whilst fatigued or tired?
YES NO

(b) Have you ever ***almost*** crashed when driving whilst fatigued or tired?
YES NO

IF NO TO BOTH, GO TO QUESTION 6. IF YES TO EITHER, GO TO PART (C)

(c) Which of the following factors do you think may have contributed to you feeling fatigued?

Work	
YES	NO
Nightclubbing	
YES	NO
Socialising with friends	
YES	NO
Studying	
YES	NO
Driving for a long time	
YES	NO
Lack of sleep	
YES	NO
Nothing in particular	
YES	NO

Anything else?(please specify)_____

Question 6: In good conditions, how much do you think that driving whilst tired or fatigued increases the chances of having a car crash? Is it…

- ❑ Not at all
- ❑ Slightly
- ❑ Moderately
- ❑ Considerably

Question 7: I'm going to list some techniques people use to keep themselves alert whilst driving. For each one, I want you to tell me if you've ever done it, and whether you think it lowers the risk of having an accident, increases the risk, or makes no difference.

	Have you done it?	LOWERS RISK	INCREASES RISK	NO DIFFERENCE
Wind down the window to feel a breeze	YES	1	2	3
Turn the music up or sing	YES	1	2	3
Chew gum or eat whilst driving	YES	1	2	3
Drive faster	YES	1	2	3
Chat with others in the car	YES	1	2	3
Talk on a mobile phone	YES	1	2	3
Stop on the side of the road and have a rest	YES	1	2	3
Drink or take caffeine (coffee, coke, red bull, guarana tablets)	YES	1	2	3
Think about other things	YES	1	2	3
Try to keep your eyes wide open	YES	1	2	3
Take drugs to keep you awake or alert	YES	1	2	3

Anything else?(please specify) _____

Question 8: Have you ever done any of the following in order to avoid driving because you were fatigued?

Taken public transport
YES NO

Asked a friend or relative to drive
YES NO

Delayed or abandoned your trip
YES NO

Used a Driver Reviver station
YES NO

Any other? (Please specify):_____

Question 9: Now I'm going to read you a few situations and ask you to describe them.

(a) A young driver knew that he or she was too tired to continue driving, but did not stop driving. Which of the following would best describe him or her:

Sensible?	YES
Just doing what everyone else does?	YES
A little bit silly?	YES
Stupid?	YES
Irresponsible?	YES
Criminal?	YES
A potential murderer?	YES

(b) A young driver knew that they were over the legal blood alcohol limit (0.07 compared with the legal 0.05), but decided to drive. Which of the following would best describe him or her:

Sensible?	YES
Just doing what everyone else does?	YES
A little bit silly?	YES
Stupid?	YES
Irresponsible?	YES
Criminal?	YES
A potential murderer?	YES

(c) A young driver was speeding at 80 km/hr in a 60 km/hr zone. Which of the following would best describe him or her?

Sensible?	YES
Just doing what everyone else does?	YES
A little bit silly?	YES
Stupid?	YES
Irresponsible?	YES
Criminal?	YES
A potential murderer?	YES

Interviewer: For this next question only (Question 10), don't prompt or read out the options, just circle the volunteered answers.

Question 10: To your knowledge, what types of penalties are currently imposed upon people who drive whilst they are fatigued?

Fine	YES	NO	If YES, how much: $_____
Demerit points	YES	NO	If YES, how many: _____ points
Jail term	YES	NO	If YES, how long: _____
Loss of license	YES	NO	If YES, how long: _____
Restricted license	YES	NO	If YES, how long: _____
Warning	YES	NO	

Question 11: What penalties do you think people who drive whilst fatigued ***should*** receive?

Interviewer to ask these questions:

Fine	YES	NO	If YES, how much: $_____
What about demerit points?	YES	NO	If YES, how many: _____ points
What about jail term?	YES	NO	If YES, how long: _____
Loss of license	YES	NO	If YES, how long: _____
Restricted license	YES	NO	If YES, how long: _____
Warning only	YES	NO	

Any others? (please specify) _____

Question 12: Provided that you have had a good night sleep and have been awake for a few hours before starting to drive, how long could you personally drive before feeling fatigued? _____Hours_____Minutes

Question 13: Provided that the average driver of your age and sex has had a good night sleep and has been awake for a few hours before starting to drive, how long do you think he or she could drive before feeling fatigued? _____Hours_____Minutes

Question 14:

(a) Do you think that Police can detect when **you** personally are too fatigued to drive? YES NO

(b) Do you think that Police can detect when the average driver of your age and sex is too fatigued to drive?

YES NO

Question 15: Which of the following methods are Police currently using to detect fatigue in drivers? Do they use:

Breath testing	YES	NO
Reflex testing	YES	NO
Saliva testing	YES	NO
Eye exams	YES	NO
Pulling you over and talking to you	YES	NO
Urine sample	YES	NO
Judgment of your driving manner	YES	NO
Nothing	YES	
Any others? (Please specify) _____		

Can select more than one response

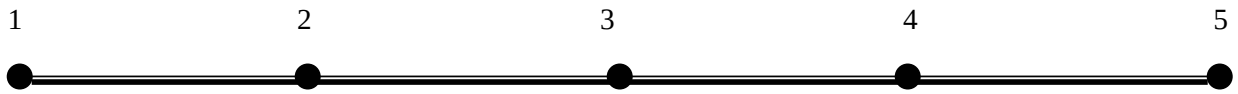
Question 16: Please complete the following sentence:

Driver fatigue affects mainly…

One response only

People driving long distances	YES
People driving on country roads	YES
Older drivers	YES
Drivers without skill or experience	YES
Driver fatigue can affect anyone	YES
Any other? (Please specify) _____	

Question 17: Compared to the average driver of your age and sex, I will now ask you to rate your chances of experiencing a number of events. For each event, please tell me whether your chance is:



Much lower than average | **Lower than average** | **SAME as average** | **Higher than average** | **OR** | **Much higher than average**

So, compared to the average driver of your age and sex, how would you rate **YOUR CHANCES**:

Of having a crash when not fatigued? Is it…	1	2	3	4	5
How about having a crash if driving while feeling fatigued?	1	2	3	4	5
How about becoming fatigued while driving short distances?	1	2	3	4	5
How about becoming fatigued while driving long distances?	1	2	3	4	5
How about being pulled over by Police for negligent driving due to fatigue?	1	2	3	4	5

COMPARED TO the average driver of your age and sex, how would you rate:

Your ability to drive safely when not fatigued? Is it…	1	2	3	4	5
Your ability to drive safely when fatigued?	1	2	3	4	5
Your driving skill when not fatigued?	1	2	3	4	5
Your driving skill when fatigued?	1	2	3	4	5
The amount of driving experience you have had?	1	2	3	4	5

Question 18: Have you seen or heard about driver fatigue in:

Television ads	YES	NO
How about road signs	YES	NO
How about billboard or roadside posters	YES	NO
Magazines or newspapers	YES	NO
Websites	YES	NO
School programs	YES	NO
Public venues	YES	NO
Cinema ads	YES	NO
In the news	YES	NO

Any other way? (please specify) _____

PART TWO

Thanks for that. I just need to collect a few more details about yourself.

Question 1: Approximately how many hours do you spend driving each week? _____ hours per week.

Question 2: What type of drivers' license do you hold?

Tick more than one if necessary.

- ❑ Learners Permit (L)
- ❑ Probationary license, old style (P)
- ❑ Probationary license, Level 1, GLS system (red P)
- ❑ Probationary license, Level 2, GLS system (green P)
- ❑ Full license
- ❑ Motorcycle license
- ❑ Large vehicle license (truck or bus)
- ❑ License disqualified

Question 3: In which year did you first receive your Learners license (your L plates)? _____
In which month? _____

Question 4: Which of the following best describes the vehicle you most frequently drive?

- ❑ Your own
- ❑ You are leasing
- ❑ Owned by a friend or relative
- ❑ Owned by the company you work for

Question 5: What is your postcode? _____

Interviewer: Only ask this next question if you are unsure. Say, "Sorry, but I have to ask this question because it's on the survey…"

Question 6: Your gender is: MALE FEMALE

Question 7: What is the main language spoken at home? _____

Question 8: Which is the highest level of education you have reached?

- ❑ Primary school only (Kindergarten to Year 6)
- ❑ Year 7 to Year 9 at High School
- ❑ Year 10 School Certificate or equivalent
- ❑ HSC or equivalent
- ❑ TAFE, College or equivalent
- ❑ University

Question 9: Which of the following best describes your occupation?

- ❑ Student
- ❑ Tradesperson
- ❑ Clerical (e.g. secretary)
- ❑ Retail/Salesperson
- ❑ Manual or Factory
- ❑ Truck driver
- ❑ Taxi driver
- ❑ Bus driver
- ❑ Courier
- ❑ House Duties
- ❑ Professional or Managerial
- ❑ Unemployed
- ❑ Other Please specify:_____

Question 10: Do you work…

- ❑ Normal hours
- ❑ Shift work
- ❑ After hours shifts only

CONCLUDING SCRIPT:

To verify that this interview was completed appropriately, my supervisor will be calling back a small number of the people surveyed, who will be selected at random; so you might receive a call back in the next few days. Would you mind telling me your first name please, so that my supervisor knows whom to ask for?

(Instruction to interviewers: record participant's name here, along with the number you rang – but don't ask the participant for the number; you should have it on your interview sheet or page of phone book numbers)
_____

Thank you very much for your time. You have been very helpful.

If you have any concerns or queries you may contact the Research Coordinator (Ms Nadine Kasparian on 02 9351 5149) or the Human Ethics Officer at Sydney University on 02 9351 4811.

Thank you for your help!

Appendix C

THE UNIVERSITY OF NEW SOUTH WALES

Approval No (when available)

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

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM

Young Drivers' Attitudes Toward Driver Fatigue

You are invited to participate in a study of 'Young Drivers' Attitudes Toward Driver Fatigue'. We hope to learn about the different ways that young drivers think about, and behave in response to, driving whilst fatigued. We aim to better understand the ways in which young drivers can be informed of the dangers associated with driving whilst fatigued. You were selected as a possible participant in this study because you are a driver visiting a motor registry inNew South Wales.

If you decide to participate, you will read a brief information pamphlet and complete a short questionnaire whilst awaiting service at the RTA. This should take you no more than 15 to 20 minutes to complete.

You will then be offered the opportunity to answer a question about the information pamphlet that you have read to go in a draw for one of 10 prizes (each prize is 2 movie tickets).

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission, except as required by law. If you give us your permission by signing this document, we plan to publish the results in reports to the Motor Accidents Authority and in journal articles and conference presentations. In any publication relating to this research, information will be provided in such a way that you cannot be identified.

Complaints may be directed to the Ethics Secretariat, The University of New South Wales, Sydney 2052, AUSTRALIA (phone 9385 4234, fax 9385 6648, email ethics.sec@unsw.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

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

If you have any questions, please feel free to ask us. If you have any additional questions later, the Chief Investigator Julie Hatfield (phone 9385 7949, email j.hatfield@unsw.edu.au) will be happy to answer them.

You will be given a copy of this form to keep.

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

PARTICIPANT INFORMATION STATEMENT AND CONSENT FORM (continued)

Young Drivers' Attitudes Toward Driver Fatigue

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

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

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

.....
Please PRINT Name

REVOCATION OF CONSENT

Young Drivers' Attitudes Toward Driver Fatigue

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

..... **.....**
Signature Date

.....
Please PRINT Name

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

Appendix D

DRIVER FATIGUE & YOU

THE UNIVERSITY OF NEW SOUTH WALES

MOTOR ACCIDENTS AUTHORITY

NSW
INJURY RISK
MANAGEMENT
RESEARCH CENTRE

This booklet was designed by Nadine Kasparian, Julie Hatfield, and Susanne Murphy in association with the NSW Injury Risk Management Research Centre, the University of New South Wales, and the Motor Accidents Authority of NSW.

IRMRC

WHAT is driver fatigue?

Driver fatigue plays a major part in crashes on NSW roads, but what exactly is it?

Driver fatigue is the experience of being “sleepy”, “tired”, or “exhausted” while driving.

When you are fatigued, you are worn out
and your skills aren’t as sharp as usual…
and you may not even notice it.

Driver fatigue can affect anyone, regardless of your age, driving skill, or experience.

Just like drink driving,
driver fatigue can severely impair your ability & judgment,
making the chances of crashing A LOT greater.

One of the major symptoms of driver fatigue is a decreased ability to judge our own level of tiredness.

Driver fatigue is determined by more than just the amount of time you have been driving. The amount of sleep you have had the night before, your level of stress, the type of work or activities you have been doing, and the time of day or night during which you are driving, all contribute to you being fatigued while driving.

Driving when you are fatigued means that
YOU *and* YOUR PASSENGERS
are MORE LIKELY to be involved in a CRASH

How COMMON is driver fatigue for young people?

Driver fatigue is NOT just a problem for truck drivers; it affects young drivers as well.

The RTA tells us that in 2001, there were **3,398 crashes** in NSW caused by driver **fatigue**. As a result of these crashes, **2002 people were either killed or injured**.

In 30% of these crashes,
a young person aged between 17- 25 years
was the fatigued driver at fault.

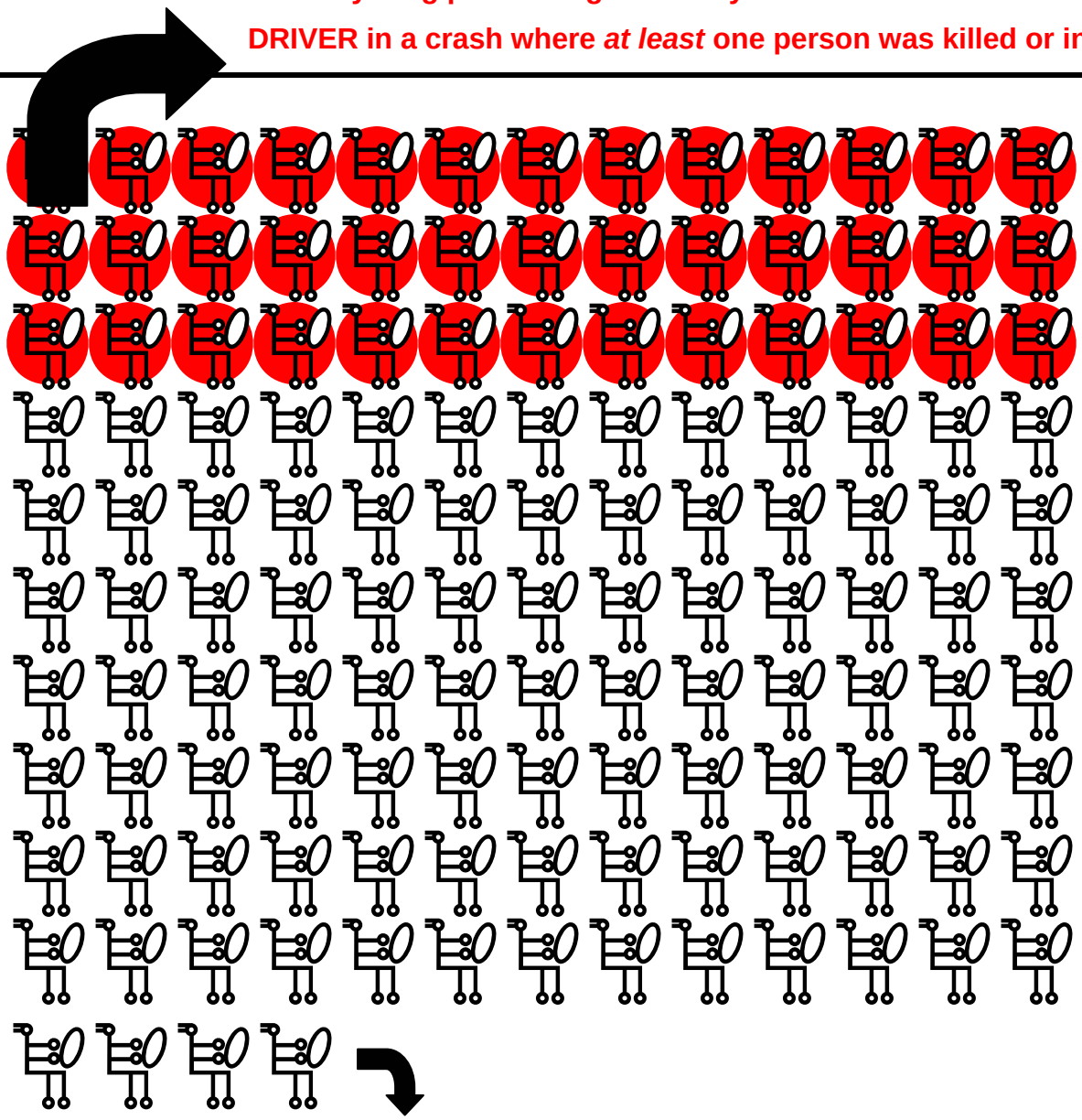
In comparison to drivers aged 40-49 years, the chances of a 17-25 year old being the driver in a fatal crash due to fatigue are **63% greater**.

That means that 17-25 years olds have a 63% ***greater chance*** of being the driver at fault in a fatigue-related crash.

On the next page is a diagram to help you make sense of these statistics.

The diagram shows all fatigue related crashes in which at least one person was killed or injured in 2002.

RED = young persons aged 17-25 years who were the FATIGUED DRIVER in a crash where *at least* one person was killed or injured.

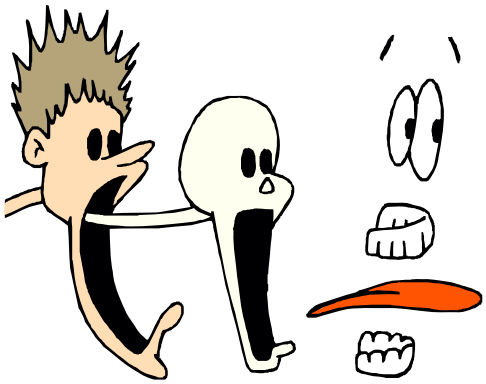


One ‘driver’ in this picture actually represents 15 drivers on NSW roads.

This means that 3 in every 10 fatigued drivers

who kill or injure someone on NSW roads

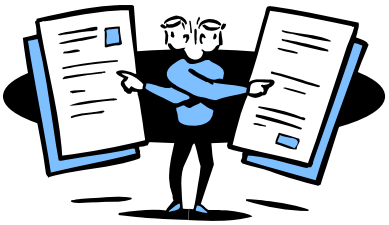
will be aged between 17-25 years.



FATIGUE-RELATED CRASHES MAY BE MORE COMMON FOR YOUNG DRIVERS THAN YOU THINK

Driver fatigue is a common problem for young persons between the ages of 17-25 years. Especially when compared to things we often *think* are common…

The diagram on the next page shows the odds of young people experiencing certain problems.



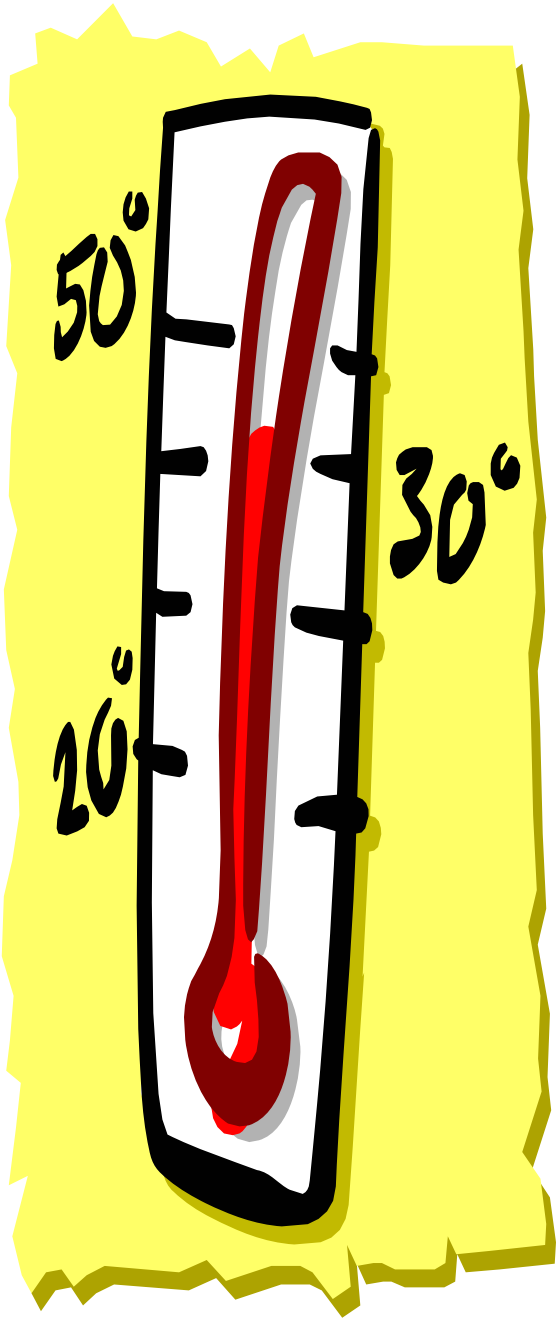
In this diagram, you can see that the rate at which young drivers cause crashes due to fatigue is actually a lot higher than the rate of problems that you may think are the main killers of young people, like suicide and cancer.

The statistics shown in the diagram apply to YOU because they are based on information about 17-25 year olds.

TAKE A LOOK AT THESE ODDS…

THEY APPLY TO YOU!

HIGH RISK!



REALLY LOW RISK

4,000 in 10,000 crashes are caused by a young driver speeding

2,000 in 10,000 crashes are caused by a fatigued young driver

1,000 in 10,000 suffer from obesity

600 in 10,000 have depression

34 in 10,000 have Chlamydia, a Sexually Transmitted Disease

3 in 10, 000 have cancer

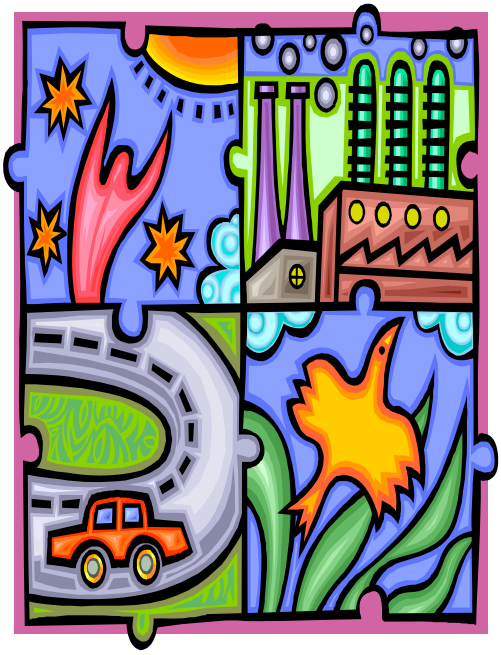
1 in 10,000 will commit suicide

Some of the statistics in this 'Risk Ladder' are incorrect. This 'Risk Ladder' was designed for an experimental protocol and neither the 'Risk Ladder' nor the statistics contained within should be quoted or used as a public education resource.

Common MYTHS about driver fatigue

Keeping my window open, chatting with friends in the car, or listening to music will keep me awake and alert

Fresh air might seem to make you feel
better for a while, but only sleep will actually reduce your fatigue. Talking to friends or playing loud music are really just extra things for you to concentrate on when you're already too tired to concentrate.



Coffee or energy drinks will keep me awake

The stimulating and performance enhancing effects of caffeine last for a short time only. After this, you become *even more* fatigued than before the caffeine.

I'm a good driver, so I can handle my car and avoid crashing while fatigued

Even if you are a good driver, when you're fatigued you can easily misjudge your environment or not react as quickly as usual.

I don't need much sleep or rest

Everyone needs sleep. Your body is programmed to feel fatigued after performing the same activity - like driving, working, or sport - over an extended period of time.

Driver fatigue is only a problem that happens on long drives or country roads

Fatigue affects your driving wherever you are. Most fatigue-related crashes or near-crashes occur when drivers have actually been on the road for less than 2 hours. Remember, it's often what you did before the drive that causes fatigue (like not sleeping, or working, or partying), not the drive itself.

Most fatigue-related crashes happen at night, when people should be sleeping

Fatigue can happen anytime, depending on your lifestyle. Most fatigue-related crashes occur at night-time (10pm – 6am) OR in the **AFTERNOON** (1pm – 3pm).

What can I do to AVOID driving whilst fatigued?

A lot of people use strategies to keep driving when they are tired. ***None work.*** If you are fatigued while you are driving, the only thing you can do to ensure that you don't crash is stop and rest. BUT, there are things you can do ***before you even start driving.***

Useful strategies to avoid fatigued driving and putting you and others at risk:

- ☑ Get at least eight hours of sleep the night before you leave.
- ☑ Avoid long drives after work, school, or strenuous activity.
- ☑ Check that any medications you are using will not cause side effects while you are driving.
- ☑ Plan your drives – determine how long you will travel and when (or where) you will take a break.
- ☑ Share the driving where possible.
- ☑ Take a break from driving at least once every 2 hours - breaks from driving help you to avoid the effects of fatigue and are even more helpful if taken early in a trip.
- ☑ Pull over and stop driving if you are feeling any of the signs of fatigue.

You know you shouldn't let a friend drink drive, so why would you let them, or yourself, drive while fatigued?

Appendix E

Thank you for consenting to participate in this survey. This questionnaire will take approximately 10 minutes to complete. All your responses are anonymous, so please do not write your name on the questionnaire.

For all questions, please answer as accurately and honestly as possible, based on what **YOU** know, your own experiences and opinions, and also the information you have just read. We really want to know what **you** think, so for each question please stop and think about what you really believe before you answer.

PLEASE MAKE SURE THAT YOU'VE READ

THE BOOKLET WE HAVE GIVEN YOU FIRST!

Because it is **so important** that you **read the booklet first**,
answering one question from us at the end of this survey will put you in the draw to
WIN a FREE MOVIE PASS FOR YOU & A FRIEND.

If you have any concerns or queries you may call **Nadine Kasparian** at the **NSW Injury Risk Management Research Centre, University of New South Wales, on 9385 5354** or the **UNSW Ethics Secretariat on 9385 4234**.

Section 1: Driving experiences

The following questions ask about your driving experiences and your views on the driving behaviours of others.

1. Please rate **YOUR chances** of experiencing the following events sometime in the future.

CIRCLE the number to indicate your response to EACH question.

	VERY LOW	LOW	AVERAGE	HIGH	VERY HIGH
(a) Having a crash if driving while feeling fatigued?	1	2	3	4	5
(b) Becoming fatigued while driving short distances?	1	2	3	4	5
(c) Becoming fatigued while driving long distances?	1	2	3	4	5
(d) Being pulled over by police for negligent driving due to fatigue?	1	2	3	4	5
(e) Your ability to drive safely when fatigued?	1	2	3	4	5
(f) Your driving skill when fatigued?	1	2	3	4	5
(g) The amount of driving experience you have?	1	2	3	4	5
(h) Your ability to drive safely when not fatigued?	1	2	3	4	5
(i) Your driving skill when not fatigued?	1	2	3	4	5
(j) Having a crash when not fatigued?	1	2	3	4	5
(k) The chances of you crashing if you are speeding?	1	2	3	4	5
(l) The chances of you crashing if you drink drive?	1	2	3	4	5

2. Please rate the chances of the **average driver of your same age and sex**, experiencing the following events sometime in the future.

CIRCLE the number to indicate your response to EACH question.

	VERY LOW	**LOW**	**AVERAGE**	**HIGH**	**VERY HIGH**
(a) Having a crash if driving while feeling fatigued?	1	2	3	4	5
(b) Becoming fatigued while driving short distances?	1	2	3	4	5
(c) Becoming fatigued while driving long distances?	1	2	3	4	5
(d) Being pulled over by police for negligent driving due to fatigue?	1	2	3	4	5
(e) Their ability to drive safely when fatigued?	1	2	3	4	5
(f) Their driving skill when fatigued?	1	2	3	4	5
(g) The amount of driving experience they have?	1	2	3	4	5
(h) Their ability to drive safely when not fatigued?	1	2	3	4	5
(i) Their driving skill when not fatigued?	1	2	3	4	5
(j) Having a crash when not fatigued?	1	2	3	4	5
(k) The chances of crashing if they are speeding?	1	2	3	4	5
(l) The chances of crashing if they drink drive?	1	2	3	4	5

3. How often do **you** drive whilst fatigued or tired? Is it… *(please tick one box only)*
   - ❑ Three or more times a week
   - ❑ Once or twice a week
   - ❑ Once or twice a month
   - ❑ Less than once a month
   - ❑ Never

4. How often would you say the **average driver of the same age & sex as you** would drive whilst fatigued? Is it… *(please tick one box only)*

- ❑ Three or more times a week
- ❑ Once or twice a week
- ❑ Once or twice a month
- ❑ Less than once a month
- ❑ Never

5. Having read the booklet today, and provided that you have had a good night sleep and have been awake for a few hours before starting to drive…

…How long could ***you personally*** drive before feeling fatigued?

_____Hours_____Minutes

(please write in your answer here)

6. Provided that the average driver of your age and sex has had a good night sleep and has been awake for a few hours before starting to drive…

…How long do you think **he or she** could drive before feeling fatigued?

_____Hours_____Minutes

(please write in your answer here)

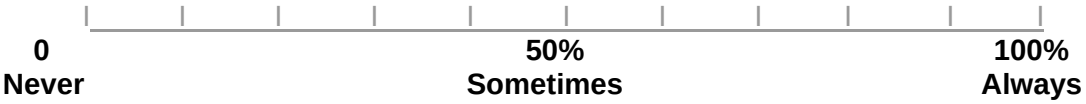
Section 2: Driving intentions

7. For the following questions, you will be asked how often you ***intend*** to perform a particular behaviour in a particular situation, as a proportion of your driving.

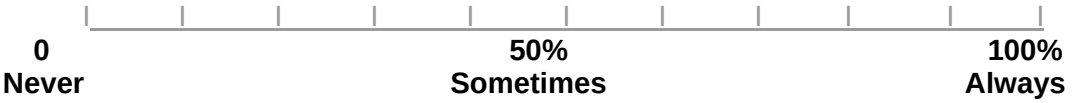
Please answer each question by placing a **vertical mark, like this:** | *anywhere* along the line to indicate your chances.

(a) When you have slept for less than 5 hours but need to drive somewhere, how often will you drive?

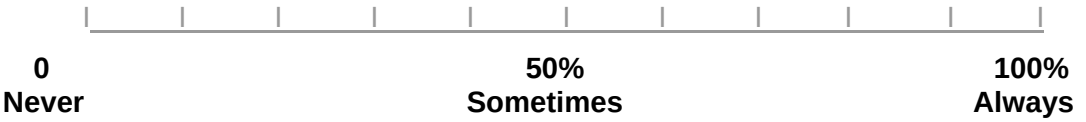
(b) When you need to drive somewhere that is about 3 hours away, how often will you do the whole drive without a break?

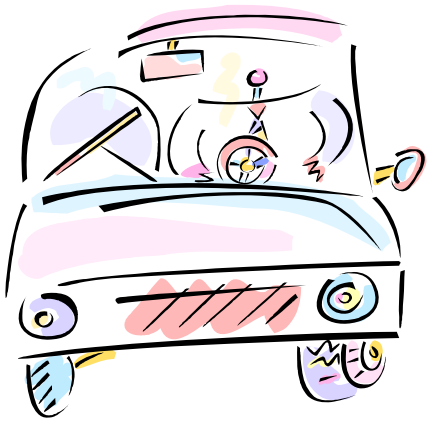


(c) When you are driving, and aware you feel fatigued, how often will you keep on driving?



(d) When you have been driving for 2 hours or more (or you know that you are fatigued) and you pass a Driver Reviver Stop, how often will you keep on driving?





8. In the future, if you're feeling fatigued or tired while driving, how likely is it that you will do each of the following things to get you through your drive:

For this set of questions, please *circle* the number to indicate your response to *each* question.

	Definitely not	**Highly unlikely**	**Probably**	**Highly likely**	**Definitely**
(a) Wind down the window to feel a breeze?	1	2	3	4	5
(b) Turn the music up or sing?	1	2	3	4	5
(c) Chew gum or eat whilst driving?	1	2	3	4	5
(d) Drive faster?	1	2	3	4	5
(e) Chat with others in the car?	1	2	3	4	5
(f) Talk on a mobile phone?	1	2	3	4	5
(g) Stop on the side of the road & have a rest?	1	2	3	4	5
(h) Drink or take caffeine? (e.g. coffee, coke, red bull)	1	2	3	4	5
(i) Try to ignore it or think about other things?	1	2	3	4	5
(j) Try to keep your eyes wide open?	1	2	3	4	5
(k) Take drugs to keep awake or alert?	1	2	3	4	5

9. In good conditions, how much do you think that driving whilst tired or fatigued increases the chances of having a car crash? Is it… *(please tick one box only)*

- ❑ Not at all
- ❑ Slightly
- ❑ Moderately
- ❑ Considerably

Section 3: Opinions about driver fatigue

These next questions ask you about what the important people in your life think about driver fatigue. (For each question, please tick one box only).

10 (a) I think that driving whilst fatigued, tired, or worn out is…

- ❑ Safe
- ❑ Sensible
- ❑ A waste of time
- ❑ Silly
- ❑ Dangerous

10 (b) My friends think that driving whilst fatigued, tired, or worn out is…

- ❑ Safe
- ❑ Sensible
- ❑ A waste of time
- ❑ Silly
- ❑ Dangerous

10 (c) My parents think that driving whilst fatigued, tired, or worn out is…

- ❑ Safe
- ❑ Sensible
- ❑ A waste of time
- ❑ Silly
- ❑ Dangerous

11 (a) I think that pulling over to the side of the road when feeling tired is…

- ❑ Safe
- ❑ Sensible
- ❑ A waste of time
- ❑ Silly
- ❑ Dangerous

11 (b) My friends think that pulling over to the side of the road when feeling tired is…

- ❑ Safe
- ❑ Sensible
- ❑ A waste of time
- ❑ Silly
- ❑ Dangerous

11 (c) My parents think that pulling over to the side of the road when feeling tired is…

- ❑ Safe
- ❑ Sensible
- ❑ A waste of time
- ❑ Silly
- ❑ Dangerous

12. Driver fatigue isn't a problem in NSW…

- ❑ Strongly agree
- ❑ Agree
- ❑ Disagree
- ❑ Strongly disagree
- ❑ Don't know

Any other comments on driver fatigue?

_____

_____

_____

Section 4: Your opinions on the information we have provided

We'd like to know what you thought about the information on driver fatigue we presented to you in the Booklet before you started this survey. When answering these questions, please DO NOT think that you need to go back and change any of your previous responses.

Please CIRCLE the number to indicate your rating:

	Not at all	Slightly	Moderately	Very	Completely
13. How **easy to read** would you rate the Booklet?	1	2	3	4	5
14. How **interesting** would you rate the Booklet?	1	2	3	4	5
15. How **relevant to you personally** would you rate the Booklet?	1	2	3	4	5

Any other comments on the Booklet?

_____

_____

_____

Section 5: Questions about you and your car

16. Are you male or female? *(please circle)* MALE FEMALE

17. How old were you at your last birthday? _____years

18. What is your postcode? _____

19. What type of drivers' license do you hold? (*Please tick more than one if necessary)*

- ❑ Learners Permit (L)
- ❑ Probationary license, old style (P)
- ❑ Probationary license, Level 1, GLS system (red P)
- ❑ Probationary license, Level 2, GLS system (green P)
- ❑ Full license
- ❑ Motorcycle license
- ❑ Large vehicle license (truck or bus)
- ❑ License disqualified

20. How long have you held a driver's licence (including Ls)? _____years _____months

21. About how many hours do you spend driving each week? _____hours per week

22. Which is the highest level of education you have reached? *(Please tick one)*

- ❑ Primary school only (Kindergarten to Year 6)
- ❑ Year 7 to Year 9 at High School
- ❑ Year 10 School Certificate or equivalent
- ❑ HSC or equivalent
- ❑ TAFE, college or equivalent
- ❑ University

23. Which of the following best describes your occupation?

- ❑ Student
- ❑ Tradesperson
- ❑ Clerical (e.g. secretary)
- ❑ Retail/Salesperson
- ❑ Manual or Factory
- ❑ Truck driver
- ❑ Taxi driver
- ❑ Bus driver
- ❑ Courier
- ❑ House Duties
- ❑ Professional or Managerial
- ❑ Unemployed

24. Do you work…

- ❑ Normal hours
- ❑ Shift work (including day shift)
- ❑ After hours shifts only

You have now completed this questionnaire.

We greatly appreciate the time and effort you have given in helping us with this study.

Please return your completed survey to our Researcher, answer their easy question, and he or she will put you in the draw to WIN a FREE MOVIE PASS FOR YOU & A FRIEND.