

# Peer Review Papers

## Young drivers' perceptions of road safety messages and a high performance vehicle advertisement: a qualitative exploration

By Sherrie-Anne Kaye\* <sup>1,3</sup>, Melanie J. White <sup>1,3</sup> and Ioni M. Lewis <sup>2,3</sup>

<sup>1</sup> School of Psychology and Counselling, Queensland University of Technology, Victoria Park Road, Kelvin Grove, Queensland, Australia, 4059. Email: [s1.kaye@qut.edu.au](mailto:s1.kaye@qut.edu.au); [melanie.white@qut.edu.au](mailto:melanie.white@qut.edu.au)

<sup>2</sup> Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology, Victoria Park Road, Kelvin Grove, Queensland, Australia, 4059. Email: [i.lewis@qut.edu.au](mailto:i.lewis@qut.edu.au)

<sup>3</sup> Institute of Health and Biomedical Innovation, Queensland University of Technology, Corner of Musk Avenue and Blamey Street, Kelvin Grove, Queensland, Australia, 4059

\* Correspondence relating to this article should be forwarded to Sherrie-Anne Kaye. E-mail: [s1.kaye@qut.edu.au](mailto:s1.kaye@qut.edu.au); Phone: + 61 7 3138 0045.

### Abstract

While road safety messages that focus on physical threats have shown some effectiveness, messages that include social threats and gains/rewards may be an alternative approach to encourage safer driving behaviours. In addition to message frame and type, motor vehicle advertising exposure may also influence the persuasiveness of road safety messages. Using qualitative methods this preliminary study explored young drivers' ( $N = 17$ , 11 males) perceptions of the persuasiveness of four anti-speeding messages and a fictional high performance vehicle advertisement. The majority of males perceived the social loss/gain-framed messages to be more persuasive (sense of responsibility and personal relevance themes), whereas females tended to perceive the physical loss/gain-frame messages (social esteem theme) to be more persuasive. Males appeared to be, while females appeared not to be, persuaded by the vehicle advertisement. The findings suggest that a range of road safety messages may be required to reach and influence young drivers.

### Keywords

Message design, Motor vehicle advertising, Persuasion, Road safety advertising, Speeding behaviour, Young drivers

### Introduction

Individuals are exposed to a wide range of health messages and product advertisements that may contain conflicting information cues. While health messages aim to persuade individuals to adopt healthier attitudes, intentions and ultimately behaviours [1], commercial advertisements are designed to promote and encourage consumers to purchase products. Speeding behaviour is one prevalent health issue that has been addressed in health messages (i.e., anti-speeding messages that aim to prevent speeding behaviour) and implied within motor vehicle advertisements (e.g., advertisements that promote high performance vehicles). While previous research has reported that some motor vehicle advertisements contain unsafe driving practices [1, 2], limited research has explored the impact that exposure to such advertisements may have upon the persuasiveness of road safety messages and, ultimately, safer driving behaviours, within the same study. As such, this preliminary study explored the first key issue of investigating mixed advertising cues by using qualitative methods to explore young drivers' thoughts and feelings towards a range of anti-speeding messages, differing in frame (gain versus loss) and type (physical versus social), and towards a high performance vehicle advertisement.

Young drivers are more susceptible to being involved in road crashes compared with older age groups [4]. Representing only 13% of the total driving population, in 2013 young drivers accounted for 19% of all driver related fatalities on Australian roads [5]. Risky driving behaviours contribute to the majority of these crashes and speeding in

particular, accounts for approximately 25% of all fatalities [6]. Evidence suggests that speeding contributes to both the frequency as well as the severity of injuries sustained if a crash occurs [7]. While individuals acknowledge that speeding contributes to road crashes [8], drivers still continue to engage in this risky behaviour. For instance, Fleiter and Watson [9] reported that speeding was viewed as an unacceptable driving behaviour by approximately two-thirds of their sample of 320 Australian drivers; however, of those respondents, 58.4% reported speeding in 100km/hr zones and 34.4% reported speeding in 60km/hr zones. Previous research has also found that young drivers may underestimate their susceptibility to, and severity of, speed related crashes and, thus, are more likely to participate in this behaviour [10, 11]. In an attempt to counter such attitudes and encourage drivers to adopt safer driving behaviours, including obeying the speed limits, various countermeasures such as road safety messages, are implemented.

## Road safety messages

Australian road safety campaigns typically use threat appeals, that is, loss-framed messages that typically focus on physical injury, to encourage safer driving through emphasising the negative consequences of speeding behaviour [1, 12]. While evidence is mixed regarding the effectiveness of threat appeals [13], additional factors, such as personal relevance [14], pre-existing attitudes [15] and individual differences such as gender [16], have been found to influence the relationship between threat appeals and message persuasion. More recently, there is growing evidence that gain-framed messages (i.e., messages that focus on the positive consequences of not performing a particular behaviour or performing the alternative, ‘safe’ behaviour; [17]) may be an alternative option to persuade young drivers to adopt safer driving behaviours [18, 19].

Road safety messages can be categorised by message type; for instance, physical versus social [17]. In terms of anti-speeding messages, physical loss-frame messages may highlight the physical injuries sustained in the event of a crash due to speeding, while social loss-frame messages may focus on the social disapproval that one may experience by not obeying the speed limit. Alternatively, both physical and social messages can be framed to represent gains (e.g., preventing injuries for physical gain-frame messages or receipt of approval for social gain-frame messages).

Past research has found that males and females respond differently to road safety messages by theme/threat type [16, 19, 20]. For instance, compared to male drivers, female drivers are more persuaded by road safety messages that contain physical threats [16, 20]. In contrast, male drivers may be more persuaded by road safety messages that consist of social threats and/or gains [15, 19]. As such, a range of both physical and social threat anti-speeding messages may need to be implemented to persuade both males and females to comply with the speed limits.

## Conflicting message cues

Adding to the complexity of the persuasion task, road safety messages must compete with a wide range of other advertisements, some of which may be considered as containing conflicting information, such as high performance motor vehicle advertisements. While there is limited evidence linking exposure to motor vehicle advertisements and subsequent engagement in risky driving behaviours [21], at the least it is arguable that exposure to high performance vehicle advertisements that contain unsafe driving practices may potentially influence (counter) the persuasiveness of road safety messages through presentation of conflicting cues about driving behaviour.

Drawing upon evidence from the alcohol-related advertising context (i.e., the negative effect that alcoholic beverage commercials have on anti-drinking messages; [22, 23]), motor vehicle advertisements may have a negative (countering) influence on the persuasive effects of road safety messages and subsequently, safer driving behaviours. For instance, Austin et al. [23] had participants watch five promotional alcohol commercials and five anti-drinking messages. Participants who reported higher levels of alcohol consumption perceived the anti-drinking messages to be less effective (in terms of persuasiveness) and the promotional alcohol commercials to be more effective than those who reported lower levels of alcohol use. Thus, these findings may suggest that alcohol promotional commercials could potentially influence drinking behaviour, particularly for those higher risk individuals. Consequently, counter advertisements (i.e., health messages designed to counter the potential negative effects of a promotional commercial; [24]) have been developed in the alcohol industry to raise awareness and educate consumers about the potential negative health consequences associated with alcohol consumption.

Since road safety messages exist in a similar environment in terms of competing information cues delivered via some types of motor vehicle advertising, research is needed to understand more about not only the influence of different types of road safety messages but, also the potential counter, mixed cues effects introduced by conflicting messages such as motor vehicle advertisements. Thus, the current study, along with providing insight into the manner in which young drivers respond to different types of road safety messages, also explores young drivers’ perceptions towards a promotional vehicle commercial after viewing four anti-speeding messages.

## Motor vehicle advertisements

Codes of Practices have been introduced in many countries worldwide to restrict the content that can be presented in motor vehicle advertisements. Indeed, these Codes of Practices were implemented due to concern that exposure to promotional vehicle advertisements that contained illegal and/or unsafe driving practices may have a negative influence on drivers’ road behaviour [25]. In Australia, the Advertising for Motor Vehicles Voluntary Code of Practice

governs the content that can be shown in motor vehicle advertisements [26]. For instance, this Code of Practice states that motor vehicle advertisements are unable to promote illegal driving behaviours or show individuals driving in an unsafe manner, such as speeding behaviour.

Since the introduction of the Advertising for Motor Vehicles Voluntary Code of Practice in 2002, motor vehicle advertisements that directly promote performance based behaviours, such as acceleration and speed, have significantly decreased [25]. However, recent research has shown that some vehicle advertising campaigns indirectly promote these risky driving behaviours [2, 27, 28]. Donovan et al. [2] presented participants with two (of three) motor vehicle advertisements that had been previously shown on Australian television. Approximately two thirds of the respondents perceived the advertisements to be promoting unsafe driving behaviours, such as speeding behaviour. Similarly, Redshaw [28] found that some of the young driver participants (18-25 years) perceived a vehicle advertisement televised in Australia as promoting reckless and irresponsible driving behaviours. Thus, despite the existence of the voluntary adherence Code of Practice, some recent Australian vehicle advertisements are still perceived by consumers to promote risky driving behaviours, including speeding.

## The present study

The aims of the present study were two-fold. As limited research has focused on participants' reactions towards a range of message concepts that all focus on the same driving behaviour in the one study, the first aim of this research was to explore young drivers' perceptions of four purposefully designed road safety messages that differed by message frame and message type (i.e., social loss-frame, physical loss-frame, social gain-frame and physical gain-frame). The second aim of this research was to explore participants' reactions towards a high performance vehicle advertisement, also purposefully designed for this study, following their exposure to the anti-speeding messages. For the purpose of this study, the motor vehicle advertisement was intentionally devised to highlight the high speed capabilities of a performance vehicle. As limited research has explored young drivers' responses to potential conflicting information cues (which may result from exposure to both anti-speeding messages and motor vehicle advertisements), qualitative research was considered by the researchers to be the most appropriate analysis for offering preliminary insight and the opportunity for participants to comment freely on any/all issues that they considered when responding to the messages that they were exposed to.

## Method

### Participants

Seventeen young licensed drivers (11 males, 65%), were recruited from an undergraduate student cohort via email and course websites to take part in interviews or small group discussions of up to three individuals. Three

interviews and six group discussions were undertaken over the course of the data collection. Table 1 provides a summary of participant groups:

**Table 1. Summary of participant groups**

| Group number | Group type | Number of participants | Participant descriptives |
|--------------|------------|------------------------|--------------------------|
| 1            | Discussion | 3                      | 19F; 19M; 23M            |
| 2            | Discussion | 2                      | 19F; 21F                 |
| 3            | Interview  | 1                      | 18F                      |
| 4            | Discussion | 2                      | 19M; 20M                 |
| 5            | Discussion | 2                      | 17F; 19F                 |
| 6            | Discussion | 3                      | 19M; 19M; 20M            |
| 7            | Interview  | 1                      | 19M                      |
| 8            | Discussion | 2                      | 21M; 21M                 |
| 9            | Interview  | 1                      | 20M                      |

Note. 19F is a 19 year old female; 19M is a 19 year old male.

Thus, using triangulation of method (i.e., conducting group discussions and interviews simultaneously; [29]) enabled the researchers to achieve a greater understanding of young drivers' perceptions towards road safety messages and a motor vehicle advertisement and reach data saturation. Out of respect for an individual's time and interest in the study, an interview was conducted if one participant signed up or attended a group session. From this point forward, the term 'discussions' will be used when referring to interviews and group discussions.

Data collection and analysis were occurring simultaneously, an approach added by the fact that the facilitator of the groups was also the primary analyst of the data. At the point of the interview with the 17th participant, it was evident that no further or new information was emerging and therefore data saturation was deemed to have been achieved and data collection ceased [30]. Selection criteria required participants to be between 17 and 25 years of age ( $M = 19.65$ ,  $SD = 1.37$ ) and to hold a current Australian drivers licence; specifically, either an open or full licence (which is a licence without any restrictions) or a Provisional drivers licence which is associated with novice driver-related restrictions ( $n = 3$  Open/Full licence,  $n = 14$  Provisional/restricted licence [31]). Acknowledging both that speeding is a transient offence (relative to a behaviour such as drink driving) and thus able to be engaged in or not on a moment-to-moment basis while one is driving, together with evidence that speeding remains the most commonly engaged in driving violation [e.g., 32] it was believed that drivers who held a current drivers' licence could be assumed to have the opportunity to speed and therefore that anti-speeding messages could be considered relevant to them. Further, comments by participants seemed to suggest

that they regularly reported driving over the recommended speed limit (sample comments are provided in later sections of this article). Taken together, this study's anti-speeding messages and vehicle advertisement were deemed to be potentially relevant to the current sample. Participants were provided with light refreshments and received course credit for their time.

## Materials

Four message concepts, all addressing speeding (i.e., physical gain-frame, physical loss-frame, social gain-frame, and social loss-frame messages) and one vehicle advertisement (i.e., an advertisement that highlighted the high speed capabilities of a high performance vehicle; see Appendix A) were purposefully devised for use in the current study. The four anti-speeding messages have been used by the current authors in past research and are published elsewhere [18]. However, for the purpose of this study, an extra sentence was added to the physical messages to match the social messages on word length (i.e., "Driving over [under] the posted speed limit increases [decreases] the number of physical injuries one may sustain in the event of a crash" for the physical loss-frame [gain-frame] messages). Further, both the social and physical messages contained the same concluding sentence representing provision of strategies to reduce/prevent speeding (i.e., "Slow down, monitor your speed; [33]).

As recommended by past research [34], the information presented in the gain-framed and loss-framed messages were identical although reversed as appropriate depending on frame type (e.g., "your friends will feel more comfortable and more confident with you as a driver when you don't speed" vs. "your friends will feel less comfortable and less confident with you as a driver when you do speed" in the social messages). By creating four road safety messages that focused on one aspect of driving behaviour, speeding, the current study was able to explore if participants' thoughts and feelings varied towards these different message types and frames. A semi-structured interview guide was used to guide discussions (see Appendix B for interview guide). In the current study, participants were informed that message persuasiveness referred to the extent to which they perceived the message(s) to be successful at convincing both themselves and other road users to reduce their speeding behaviour. Further, all messages were presented to participants as written concept outlines and each typed in 16-point font on a separate A4 sheet of paper.

## Procedure

The research was granted ethical approval (Reference number 100001188). Discussions were undertaken in a small quiet room located on a university campus, with most participant discussions ranging from 35 minutes to 1 hour. All sessions were audio recorded and the moderator, the first author, took notes during the sessions to record any key comments and non-verbal cues. To increase the likelihood that the participants would feel comfortable to share their

thoughts and feelings and to provide honest information, the moderator and participant(s) were the only persons present during the discussions.

Prior to the discussions, participants were asked to sign a consent form and to complete a short self-report questionnaire that consisted of demographic items (e.g., age and gender). At the start of each session, the participants were informed that the purpose of the research was to gain a greater understanding of young drivers' perceptions of road safety campaigns. The moderator commenced the discussions by asking general questions on current road safety campaigns to engage participants in the topic of interest. Once the moderator perceived that all participants appeared comfortable sharing their thoughts and feelings towards current road safety campaigns, participants were presented with the anti-speeding messages. To enable the moderator to explore participants' thoughts and feelings to each individual message, all messages were presented to each participant, however each was presented one at a time and they were counterbalanced throughout the sessions to reduce potential order and/or fatigue effects. Further, to avoid influencing participants' responses towards the messages, participants were not informed that the anti-speeding messages differed in message frame or type.

On completion of discussing the anti-speeding messages, participants were provided with and read the motor vehicle advertisement. The motor vehicle advertisement was presented last in each session as the first key objective was to assess participants' responses to the road safety messages, prior to assessing their responses to the motor vehicle advertisement and the potential persuasive (or dissuasive) effects associated with conflicting information cues. All discussions concluded with the moderator providing a summary of key points to the participants to check for understanding and to clarify any discrepancies. No discrepancies were stated by the participants.

## Data analysis

Discussion recordings were transcribed verbatim by the first author. By moderating the discussions and transcribing the data, the first author was able to become familiar with the data, enhancing the reliability and trustworthiness of the analysis. Thematic analysis was conducted to provide a systematic analysis of the data and concept-driven coding was used to generate initial codes [35]. The codes were initially derived separately for each road safety message and the motor vehicle advertisement. However, to ensure that any unexpected findings were not overlooked, additional codes were created for responses that were outside the key areas of interest. Themes were then identified by reviewing the frequency, elaboration, and extensiveness of the coded data across all transcripts [36]. Frequency was considered in the identification of themes (i.e., a particular concept/category needed to be noted by at least two respondents) and elaboration and extensiveness were evaluated by the extent to which a particular issue was discussed. The process of creating and reviewing themes from the coded data continued until no new themes were identified. To enhance both the reliability and the validity

of the data, the co-authors (who were also involved in the study's design and are experienced researchers in road safety and young drivers) worked together with the first author to refine the themes. Themes are highlighted by direct participant quotes. To ensure participants' anonymity, all quotes provided are cited only in terms of age and gender of the participant (e.g., 17M is a 17 year old male).

## Results and discussion

The findings are presented according to the two overarching themes: (1) the perceived persuasiveness of the road safety messages and (2) the perceived persuasiveness of the promotional motor vehicle advertisement. These findings are presented in conjunction with the discussion to allow for comparison between the current themes and previous road safety research.

### Message manipulation

Without being prompted, all participants identified that the loss-frame messages included negative cues and that the gain-frame messages included positive cues, thus supporting the researchers' a priori expectations. Further, the social messages were perceived by the participants to consist of social cues (e.g., social disapproval and approval for the loss and gain-framed messages, respectively) and the physical messages were perceived to contain physical cues (e.g., increasing physical injuries for the physical loss-framed message and preventing physical injuries for the physical gain-framed message). However, the words "protecting yourself and your loved ones" in the physical messages were interpreted by some participants as social cues. Despite participants perceiving the words "protecting yourself and your loved ones" to be social cues, overall it was still considered that these messages contained appropriate physical cues (e.g., increasing [decreasing] injury and death for the loss and gain-framed messages, respectively) to be classed as physical themed messages.

### Persuasiveness of road safety messages

#### Loss-frame anti-speeding messages

For the loss-frame messages, two main themes were identified. The first theme, sense of responsibility towards passengers was identified to influence the persuasiveness of the social loss-frame message. Message repetition effects, in terms of potential desensitisation from previous media exposure to physical loss-framed messages, were identified as an influence on the persuasiveness of the physical message among this sample of young drivers.

#### Sense of responsibility towards passengers

Only male participants (all except one male) perceived the social loss-frame message to be persuasive, stating that they felt a stronger sense of responsibility towards their passengers after viewing the social loss-frame message. After reading the social loss-frame message, the majority of male participants acknowledged the impact that their own

speeding behaviour would have on their passengers and/or their friends.

"The idea of making someone feel uncomfortable, especially someone that you care about, that might be a bit more of a reason to slow down as opposed to making friends feel comfortable" (20M)

"I can almost picture it, you're speeding with your friends in the car and for me I can just see myself doing that and now I'm thinking well I am endangering my friends' lives" (19M)

"After reading the first sentence it made me think from the perspective of a passenger. It just instantly made me realise that this is true, this is probably how people think in the car with you and even just from the first word, I'm paying attention, I'm absorbing it" (19M)

Research has reported that young male drivers are more likely to participate in risky driving behaviours, such as speeding, compared to their female counterparts [37]. Thus, it has been well acknowledged that road safety messages need to be specifically designed to target this high risk group. As shown in the current study and supported by previous research, social loss-frame messages may be an alternative option, compared to the more predominant physical threat messages to persuade young male drivers to adopt safer driving behaviours [19].

In contrast, and reflecting a point of departure between males and females, female participants (with one exception) expressed negative reactions towards the social loss-frame message.

"I kind of get annoyed by that message, purely because I think that it's a bit of a generalisation that friends would think that you're not caring about them" (19F)

"It does annoy me because it's telling me this assumption that you don't care about your friends" (17F)

"It makes you a bit annoyed actually... you're assuming that I speed with my friends, well I don't" (21F)

These responses suggest that most female participants were unlikely to be persuaded by the social loss-frame message. In particular, the majority of female participants perceived that this message was suggesting that they do not care for the safety of their friends and found this inference somewhat offensive. Findings revealed, however, that female participants showed more favourable responses towards the social gain-framed message, even though the content in the social loss-frame message was exactly the same as the content in the social gain-frame message expect for message frame. Thus, this finding suggests that message frame may be an important influence upon the persuasiveness of road safety messages for young drivers and, that such subtleties need to be considered carefully in advertisement design.

While young female drivers have a lower crash risk compared to their male counterparts [38], recent research has reported that young female drivers are becoming more susceptible to road crashes due to an increase in risk taking behaviours [39]. In the current study, both male and female participants reported that they drove over the posted speed limit.

“Going over 10% I know that I’m speeding, but I do it anyway” (20M)

“I could go over 100 [in a 60km/h zone] and sometimes I do when I’m running late to work” (19M)

“I generally drive according to the road... I tend to ignore speed limits” (19M)

“When I’m on a long road [in a 60km/h zone], I’d be going something like 80 [km/h] if I knew that there weren’t any cops around” (19F)

Thus, it appeared that gender differences towards the perceived persuasiveness of the social loss-frame messages was not due to differences in the extent to which males and females (self) reported engagement in speeding behaviour.

#### Message repetition effects

The second main theme that was identified for the loss-frame messages was that some participants reported that previous exposure and repetition of physical threats in the media for road safety campaigns (e.g., death and injury) reduced the persuasiveness of the physical loss-frame message. While the current study’s messages were not considered threat appeals, similar terminology (e.g., death and injury) used in the physical loss-frame message is consistent with the terminology used in current road safety campaigns that focus on physical threats.

“They’re all the same, you’ve seen one of them, you’ve seen them all” (19M)

“It gives you a statistic and tells you that if you speed you might injure or kill yourself which is something that you’ve already been told like a thousand times over” (20M)

“I assume that these campaigns [threat-based messages] have been around 20-30 years, so I guess our generation is...” (23M), “Bored with them” (19F), “Maybe desensitised to them, cause they’ve just been around forever, our whole life spans” (23M)

While previous research has reported that fear has the greatest effect immediately following exposure [19, 40], message wear out effects mean that message persuasiveness decreases over time and exposure [41, 42]. Road safety campaigns in Australia typically use physical threat based appeals to emphasise the negative consequences of speeding behaviour [1, 12]. However, as these findings highlight, some young drivers felt desensitised to these physical consequences due to previous media exposure. In particular, male participants were more likely to report message repetition effects than female participants.

Consistent with previous research [16, 20], this finding further supports the suggestion that male drivers may find road safety incorporating social consequences to be more persuasive whereas female drivers may be more persuaded by road safety messages that focus on the physical consequences.

#### Gain-frame anti-speeding messages

Personal relevance and social esteem were identified as the two main themes in terms of factors influencing the persuasiveness of the social and physical gain-frame messages, respectively.

#### Personal relevance

Gain-frame messages that focused on friends and family were perceived by some participants to be more relevant than those messages that focused on other road users.

“You’d be more conscious of what you’re doing [with friends in the car]” (19M)

“I think that if they could target responsibility, they would get a lot further. That [social gain-frame message] is a good way of doing it” (19F)

“I think the idea of being a good friend and having the responsibility for other people, it’s just more immediate than a random figure of the people who will die or have injuries” (21F)

“If it’s just 400 random people, I know that that’s still much larger but, if its people close to you, I reckon that will help stop, prevent or deter people” (18F)

“This is probably going to sound horrible but, 400 people out of that many [the number of people who drive] doesn’t seem like a lot. It would probably be different if it was someone that you cared about or who was close to you” (19F)

As the above comments highlight, some participants appeared to express greater concern for protecting their friends and family than for other road users. Past theoretical (e.g., Elaboration Likelihood Model; [43]) and empirical evidence [14, 16, 34] has reported that individuals who perceive health messages as being personally relevant are more likely to be persuaded by a message. For instance, Millar and Millar [34] found that individuals who had previously been involved in a traffic crash (i.e., higher issue involvement/personal relevance) had reported greater intentions to comply with the gain-frame road safety messages compared to those individuals who had never been involved in a traffic crash (i.e., lower issue involvement/personal relevance). One way to enhance personal relevance is to tailor the message to the target audience [44]. Thus, road safety messages that emphasise the positive consequences that obeying the speed limit would have on one’s friends and/or family (e.g., protecting the lives of their loved ones), may be more relevant to young road users. Further, these messages may be more persuasive for this age group than messages reflecting consequences for the broader community.

**Social esteem**

In terms of the physical gain-frame message, promoting a sense of social esteem was reported by some participants to increase the persuasiveness of the message. In this context, the researchers defined social esteem as feeling good about one’s self by obeying the road rules and protecting the safety of other drivers.

“I think that everyone likes to be a little heroic” (21F)

“Cause of the positive spin, it’s nice. It’s like you have the opportunity to save lives as opposed to, you have the possibility not to die, like, everyone wants to feel like a hero” (19M)

“It’s more reaffirming [than the loss-frame messages], almost praising them for safe driving and it gives people the idea that when you’re safe you’re achieving something” (19M)

**Overall perceived message persuasiveness**

After participants were exposed to the four anti-speeding messages they were asked, “Of the four road safety messages, which message(s) would you find most effective?” Responses to this question varied among participants. While some participants reported the loss-frame messages, a few others reported the gain-frame messages, to be more persuasive. Further, some participants overlooked message frame and instead based their decision on the type of message (i.e., physical or social messages; see Table 2 for a summary of participant responses). This finding supports the notion that ‘one size does not fit all’ and further emphasises the need to implement a range of both loss-frame and gain-frame road safety messages to adequately capture the attention of and ultimately persuade all young drivers.

**Table 2. Message effectiveness ratings for male and female participants**

| Age               | Anti-speeding message(s) that participants perceived to have greater effectiveness |
|-------------------|--|
| Male Participants |  |
| 19                | Social loss-frame  |
| 19                | Social loss-frame  |
| 19                | Social gain-frame  |
| 19                | No message   |
| 19                | Social loss-frame & physical gain-frame  |
| 20                | Social loss-frame  |
| 20                | Social gain-frame & physical gain-frame  |
| 20                | Social loss-frame & physical loss-frame  |
| 21                | Physical loss-frame  |
| 21                | Social loss-frame  |
| 23                | Social gain-frame & physical loss-frame  |

| Age                 | Anti-speeding message(s) that participants perceived to have greater effectiveness |
|---------------------|--|
| Female participants |  |
| 17                  | Physical loss-frame  |
| 19                  | Physical loss-frame  |
| 19                  | Social gain-frame & physical loss-frame  |
| 19                  | Physical gain-frame & social gain-frame  |
| 19                  | Social gain-frame & social loss-frame  |
| 21                  | Physical gain-frame & social gain-frame  |

All but one participant indicated that they would find at least one of the anti-speeding messages to be persuasive. However, some participants, particularly the males, stated that other groups of road users (i.e., learner and middle aged drivers) would be more persuaded by the four road safety messages than young drivers. Consistent with previous road safety research that has explored the construct of the third person effect [16], this finding suggests that young male drivers may perceive that other drivers are more persuaded by road safety messages than themselves. Further, as one participant noted, young drivers may be less inclined to abide by road safety messages as they may perceive other road users as having a greater crash risk compared to themselves (i.e., existence of optimism bias in the road safety context; [11]).

“I think [the physical messages would be more effective for] maybe older people more than younger people, just knowing my friends, I think they’d be like, yeah whatever, this message doesn’t really appeal to me, it doesn’t really matter... because I’m not going to kill them” (19F)

Evidence has reported that young drivers have a greater crash risk than both learner and middle aged road users [45, 46]. As such, road safety messages need to be specifically designed to appeal to young road users.

**Persuasiveness of a high performance vehicle advertisement**

All participants perceived that the motor vehicle advertisement was promoting speeding behaviour. Further, all participants believed that this advertisement was designed to target young male drivers. However, as found in relation to the road safety messages, participants’ reactions towards the motor vehicle advertisement appeared to differ according to gender. Comments expressed by participants seem to suggest that while most of the males in this sample found the motor vehicle advertisement to be persuasive, most of the female participants were not persuaded and instead tended to report the advertisement to be irresponsible. While it is acknowledged that the current sample of participants consisted of more males than females, the current findings provide some insight into the different perceptions towards motor vehicle advertisements

in relation to gender differences. However, while males are often the intended audience of such motor vehicle advertisements, future research is still required to examine if similar findings are found in a sample size that consists of a higher proportion of female participants.

#### Potential negative influence on driving behaviours

Male participants responded favourably towards the motor vehicle advertisement and all but one male stated that they wanted to test drive the vehicle presented in the advertisement.

“It’s awesome, I want this car” (19M)

“Driving cars like that is fun...” (21M)

“It’s not really about the ‘envy of all your mates’, screw my mates, I just want to drive that car” (19M)

“If I had the opportunity I would test drive it [the car]. I would be like, yes please” (20M)

“I would test drive it [the car]... it would be pretty fun I think” (21M)

Such comments suggest that the male participants liked and were potentially persuaded by this vehicle advertisement. One factor that seemed to influence the persuasiveness of the advertisement was the speed capabilities of the high performance vehicle.

“It’s pretty amazing that it can accelerate that quickly.... even though I’m not a rev head, I wouldn’t mind experiencing getting to 100ks in 6 seconds” (20M)

“The first thing that I felt when I read 100km/hr in 0-6 seconds, I was just like I want to have a dig, I want to trial it [the car]. To experience 0-100 in 6 seconds, that sort of acceleration would be exciting” (20M)

As these comments highlight, speeding behaviour that is implied within motor vehicle advertisements may potentially encourage young male drivers to participate in reckless and risky driving behaviours. While it is acknowledged that the vehicle advertisement in this study was designed specifically to highlight the speed capabilities of a high performance vehicle to maximise the likelihood of detecting potential counter mixed cue effects, speeding behaviour that is indirectly implied within motor vehicle advertisements may have a negative impact on intentions to drive safely. Further, as the following spontaneous comment from a young male participant suggests, exposure to motor vehicle advertisements that promote high performance vehicles may actually have a negative (counter) influence on the potential persuasiveness of road safety messages.

“I’m more interested in driving this car, than worrying about these [road safety] messages” (23M)

Prior to viewing the motor vehicle advertisement, this participant had stated that he would find the social gain-frame message and physical loss-frame message to be

persuasive. However, as indicated in his subsequent comment, the motor vehicle advertisement had a negative influence on the persuasiveness of the previously viewed road safety messages. Given that road safety messages share the same advertising space as motor vehicle advertisements, this response highlights the need for future research to examine the potential implications that motor vehicle advertisements may have on the persuasiveness of competing road safety messages, particularly for young male drivers.

#### Potential positive influence on driving behaviours

In contrast to the male participants, female participants appeared not to be persuaded by the motor vehicle advertisement and instead identified that it promoted dangerous behaviour.

“That’s a dangerous car. I guess that guys would like it. It doesn’t really appeal to me cause I don’t want a dangerous car” (18F)

“It doesn’t say that speeding is good but, it kind of says like, look, this is what you can do” (19F)  
 “Totally irresponsible” (21F) “Like come buy our car and jump on the highway and go insane” (19F) “It’s like challenging people almost. See how fast you can go without getting caught” (21F) “That’s exactly what it’s like” (19F)

“It just doesn’t appeal to me because just driving at 110 is a bit scary for me” (17F)

Such findings suggest that the promotion of high performance vehicles in advertisements may not appeal to young female drivers. Unlike male participants, female participants perceived the vehicle in the advertisement to be dangerous and unsafe. One explanation for this finding may be that male drivers consider risky driving behaviours to be more acceptable compared to female drivers [47]. Further, previous research has reported that male drivers invest more of their identity into the performance of a motor vehicle than female drivers [48]. Thus, since male drivers may place stronger importance on the performance of their vehicles, exposure to high performance advertisements may be more appealing to this cohort of drivers compared to female drivers. However, it should also be noted that viewing the road safety messages first may have primed female participants to have heightened negative reactions towards the vehicle advertisement. Further research is therefore required to examine if order effects introduced through first viewing anti-speeding messages may have influenced young drivers’ acceptance of a motor vehicle advertisement that promotes high performance vehicles. More specifically, future research should continue to include a range of road safety messages and motor vehicle advertisements to investigate the potential influence that mixed message cues may have on young drivers’ acceptance of road safety messages with a larger and more representative sample.

## Summary and conclusion

This study revealed that designing anti-speeding messages that make drivers feel good about themselves, may be an alternative option to encourage young drivers to abide by the road rules. For instance, social esteem was one concept that emerged from these findings that may increase the persuasiveness of anti-speeding messages for some young drivers. Further, and consistent with previous research [1, 18, 19], the current findings suggest a need to introduce a range of road safety messages to effectively capture and persuade different groups of young road users to abide by the road rules. One way to increase young drivers' perceptions of relevance for anti-speeding messages may be to focus on the positive consequences that safer driving behaviours leads to for one's family and friends (e.g., protecting the safety of your family and friends, gaining social approval).

The current study helps to address a gap in knowledge: specifically, this study explored young drivers' thoughts and feelings to four message concepts that all addressed one risky driving behaviour, speeding, and which were intentionally designed to vary only the message type and frame. Unlike previous research, this study has controlled for potential confounds (e.g., different road safety behaviours) that could have influenced the interpretation of the current findings [49]. Specifically, the findings indicate that participants' reactions to these messages differed according to message frame (gain and loss) and message type (physical and social). However, while these findings provide an insight into young drivers' perceptions towards different messages, future research is required to examine if these findings can be replicated in other contexts such as, exposing participants to already existing anti-speeding messages and motor vehicle advertising campaigns to further assess the influence that mixed message cues may have on the persuasiveness and acceptance of road safety messages.

For the high performance vehicle advertisement, this study found that this advertisement was perceived by this sample of male drivers to be persuasive, whereas female drivers perceived it to be dangerous and unsafe. Thus, in combination with road safety messages, future research should examine the effects that motor vehicle advertisements may have on the driving behaviour of young drivers. It is acknowledged, however, that consistently exposing all participants to the road safety messages prior to the motor vehicle advertisement could have influenced participants' responses towards the latter. In everyday exposure to television advertising, multiple conflicting messages (e.g., media advertising, family, and peers) are likely and it is possible that there could be order effects in regards to whether an individual is first exposed to a road safety message followed by a motor vehicle message or vice versa. The current study was particularly interested in whether the persuasive effects (either positive or negative) of anti-speeding messages could be influenced by subsequent exposure to a motor vehicle advertisement; however, in order to address any potential order effects, it

is recommended that future research employ a quantitative design which features counterbalancing of the order of presentation of the motor vehicle and road safety messages. While the qualitative nature of this design provides a preliminary investigation of the influence that mixed message cues may have on the persuasiveness of road safety messages, quantitative research that comprises a larger, more representative sample of young drivers is needed to further investigate the influence of the potential counter mixed cue effects that motor vehicle advertisements may have on the persuasiveness of competing road safety messages.

In summary, this study provides an initial understanding of young drivers' thoughts and feelings towards four message concepts that all addressed speeding behaviour and differed in message frame and type. Further, this study's findings highlight the need for further research to examine the potential counter effects that a high performance vehicle advertisement could have on the persuasiveness of road safety anti-speeding messages in instances where the order of presentation varies such that the motor vehicle advertisement is presented first and its impact on the subsequent persuasiveness of the road safety messages is explored. Subject to replication of the current findings via a quantitative study with a large sample of young drivers, the current findings do add further support for the importance of designing a variety of road safety messages to target a range of different young road users. In addition, the study provided insight into the impact that mixed message cues, which were represented in this study as exposure to road safety messages followed by exposure to a motor vehicle advertisement, may have upon perceived persuasiveness of both types of messages. By undertaking the first steps in exploring the potential influence that vehicle advertisements may have on the persuasiveness on road safety messages, this study has shown the value of continuing to investigate mixed message cues.

## References

1. Lewis IM, Watson BC, White KM. Response efficacy: The key to minimizing rejection and maximizing acceptance of emotion-based anti-speeding messages. *Accident Analysis and Prevention* 2010; 42(2):459-467.
2. Donovan RJ, Fielder L, Ouschan R. (2011). Do motor vehicle advertisements that promote vehicle performance attributes also promote undesirable driving behaviour? *Journal of Public Affairs* 2011; 11(1):25-34.
3. Shin PC, Hallett D, Chipman ML, Tator C, Granton JT. Unsafe driving in North American automobile commercials. *Journal of Public Health* 2005; 27(4):318-325.
4. Clarke DD, Ward P, Truman W. Voluntary risk taking and skill deficits in young driver accidents in the UK. *Accident Analysis and Prevention* 2005; 37:523-529.
5. Bureau of Infrastructure, transport and regional economics [BITRE]. Road deaths Australia: 2013 statistical summary. Viewed 19<sup>th</sup> August, 2014. [http://www.bitre.gov.au/publications/ongoing/files/RDA\\_Summary\\_2013.pdf](http://www.bitre.gov.au/publications/ongoing/files/RDA_Summary_2013.pdf)

6. Australian Transport Council. National Road Safety Action Plan 2007-2008, 2006. Viewed 10<sup>th</sup> May 2013. [http://www.lags.corep.it/doc/ICorsoSpec/Supporti%20tecnici/au\\_nrs-actionplan\\_07-08.pdf](http://www.lags.corep.it/doc/ICorsoSpec/Supporti%20tecnici/au_nrs-actionplan_07-08.pdf)
7. World Health Organization [WHO]. Youth and road safety, 2007. Viewed 7<sup>th</sup> May 2013. [http://whqlibdoc.who.int/publications/2007/9241595116\\_eng.pdf](http://whqlibdoc.who.int/publications/2007/9241595116_eng.pdf)
8. Kloeden CN, Ponte G, McLean AJ. Travelling speed and the risk of crash involvement on rural roads, Report CR 204, 2001. Viewed 10<sup>th</sup> May 2013. <http://casr.adelaide.edu.au/ruralspeed/RURALSPEED.PDF>
9. Fleiter JJ, Watson B. The speed paradox: The misalignment between driver attitudes and speeding behaviour. *Journal of the Australasian College of Road Safety* 2006; 17(2):23-30.
10. Harfe, N, Foster S, O'Neill M. Self-enhancement, crash-risk optimism and the impact of safety advertisements on young drivers. *British Journal of Psychology* 2005; 96:215-230.
11. White MJ, Cunningham LC, Titchener K. Young drivers' optimism bias for accident risk and driving skill: Accountability and insight experience manipulations. *Accident Analysis and Prevention* 2011; 43(4):1309-1315.
12. Tay R, Watson B. Changing drivers' intentions and behaviours using fear based driver fatigue advertisements. *Health Marketing Quarterly* 2002; 19(4):55-68.
13. Elliott BJ. The psychology of fear appeals re-visited. In *Australasian Road Safety Research Policing and Education Conference*, Sydney, Australia, 2003.
14. LaTour M, Rotfeld H. There are threats and (maybe) fear-caused arousal. Theory and confusion of appeals to fear and fear arousal itself. *Journal of Advertising* 1997; 26(3):45-59.
15. Lewis I, Watson B, White KM. What do we really know about designing and evaluating road safety advertising? Current knowledge and future challenges. In *Australasian Road Safety Research Policing and Education Conference*, Sydney, Australia, 2009.
16. Lewis I, Watson B, Tay R. Examining the effectiveness of physical threats in road safety advertising: The role of the third-person effect, gender, and age. *Transportation Research Part F: Traffic Psychology and Behaviour* 2007; 10(1):48-60.
17. Donovan RJ, Henley N. Negative outcomes, threats and threat appeals: Widening the conceptual framework for the study of fear and other emotions in social marketing communications. *Social Marketing Quarterly* 1997; Fall:56-67.
18. Kaye S-A, White MJ, Lewis IM. Individual differences in drivers' cognitive processing of road safety messages. *Accident Analysis and Prevention* 2013; 50:272-281.
19. Lewis I, Watson B, White KM. An examination of message-relevant affect in road safety messages: Should road safety advertisements aim to make us feel good or bad? *Transportation Research Part F: Traffic Psychology and Behaviour* 2008; 11:403-417.
20. Goldenbeld C, Twisk D, Houwing S. Effects of persuasive communication and group discussions on acceptability of anti-speeding policies for male and female drivers. *Transportation Research Part F: Traffic Psychology and Behaviour* 2008; 11:207-220.
21. Jones SC. Fast cars, fast food, and fast fixes: Industry responses to current ethical dilemmas for Australian advertisers. *Journal of Public Affairs* 2007; 7:148-163.
22. Ahn H, Wu L, Kelly S, Haley E. A qualitative study of college student responses to conflicting messages in advertising: Anti-binge drinking public service announcements versus wine promotion health messages. *International Journal of Public Health* 2011; 56:271-279.
23. Austin E, Pinkleton B, Fujioka Y. Assessing prosocial message effectiveness: Effects of message quality, production quality, and persuasiveness. *Journal of Health Communication* 1999; 4:195-210.
24. Agostinelli G, Grube JW. Alcohol counter-advertising and the media. *Alcohol Research & Health* 2002; 26(1):15-21.
25. Schonfeld C, Steinhardt D, Sheehan M. A content analysis of Australian motor vehicle advertising: Effects of the 2002 voluntary code on restricting the use of unsafe driving themes. In *Australasian Road Safety Research Policing and Education Conference*, Wellington, New Zealand, 2005.
26. Federal Chamber of Automatic Industries. Voluntary Code of Practice for Motor Vehicle Advertising, 2009. Viewed 8<sup>th</sup> May 2013. [http://www.fcai.com.au/library/publication/1250483030\\_document\\_amended\\_code\\_-\\_final\\_-\\_oct\\_07.pdf](http://www.fcai.com.au/library/publication/1250483030_document_amended_code_-_final_-_oct_07.pdf)
27. Donovan RJ, Fielder L, Ouschan R, Ewing M. Self-regulation of motor vehicle advertising: Is it working in Australia? *Accident Analysis and Prevention* 2011; 43: 631-636.
28. Redshaw S. (2011). Dangerous safety: Extreme articulations in car advertising and implications for safety campaigns. *Journal of Australasian College of Road Safety*, 2011; 22(4):57-63.
29. Lambert SD, Loiselle CG. Combining individual interviews and focus groups to enhance data richness. *Journal of Advanced Nursing* 2008; 62(2):228-237.
30. Morgan DL. Planning focus groups (Book 2) [Focus group kit]. Thousand Oaks, CA: Sage, 1998.
31. Department of Transport and Main Roads. Provisional licence restrictions. Viewed 13<sup>th</sup> October, 2014. <http://www.qld.gov.au/transport/licensing/driver-licensing/applying/provisional/restrictions/index.html>
32. Gavin A, Walker E, Murdoch C, Graham A, Fernandes R, Job RFS. Is a focus on low level speeding justified? Objective determination of the relative contributions of low and high level speeding to the road toll. In *Australasian Road Safety Research Policing and Education Conference*, Canberra, Australia, 2010.
33. Lewis I, Newnam S. The development of an intervention to improve the safety of community care nurses while driving and a qualitative investigation of its preliminary effects. *Safety Science* 2011; 49:1321-1330.

34. Millar MG, Millar KU. Promoting safe driving behaviors: The influence of message framing and issue involvement. *Journal of Applied Social Psychology* 2000; 30(4):853-866.
35. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology* 2006; 3:77-101.
36. Krueger RA. *Analyzing and reporting focus group results*. Thousand Oaks, CA: Sage, 1998.
37. Harfe N, Field J, Kirkwood B. Gender differences and areas of common concern in the driving behaviors and attitudes of adolescent. *Journal of Safety Research* 1996; 27(3):163-173.
38. Monárrez-Espino J, Hasselberg M, Laflamme L. First year as a licensed car driver: Gender differences in crash experience. *Safety Science* 2006; 44(2):77-85.
39. Romano E, Kelly-Baker T, Voas RB. Female involvement in fatal crashes: Increasingly riskier or increasingly exposed? *Accident Analysis and Prevention* 2008; 40:1781-1788.
40. Evans RI, Rozelle RM, Lasater TM, Dembroski TM, Allen BP. Fear arousal, persuasion, and actual versus implied behavioral change. *Journal of Personality and Social Psychology* 1970; 16(2):220-227.
41. Fry TRL. Advertising wearout in the transport accident commission road safety campaigns. *Accident Analysis and Prevention* 1996, 28(1):123-129.
42. Schoenbachler DD, Whittler TE. Adolescent processing of social and physical threat communications. *Journal of Advertising* 1996; XXV (4):37-54.
43. Petty RE, Cacioppo JT. The elaboration likelihood model of persuasion. *Advance in Experimental Social Psychology* 1986; 19:123-205.
44. Kreuter MW, Wray RJ. Tailored and targeted health communications: Strategies for enhancing information relevance. *American Journal of Health Behavior* 2003; 27: S227-S232.
45. Lewis-Evans B. Crash involvement during the different phases of the New Zealand Graduated Driver Licensing System (GDLS). *Journal of Safety Research* 2010; 41(4): 359-365.
46. McGwin G, Brown D. Characteristics of traffic crashes among young, middle aged, and older drivers. *Accident Analysis and Prevention* 1999; 31:181-198.
47. Redshaw, S. Dangerous gender performances: 'Hydraulic masculinity' as a norm for young male drivers. In *Australasian Road Safety Research Policing and Education Conference*, Gold Coast, Australia, 2006.
48. Steg L. Car use: Lust and must. Instrumental, symbolic and affective motives for car use. *Transportation Research Part A: Policy and Practice* 2005; 39(2-3):147-162.
49. Donovan, R. Guidelines for creating effective road safety advertising. Report to Federal Office of Road Safety, Donovan Research, 1995.

## Appendix A

### Motor Vehicle Advertisement

This high performance sports model can achieve 0 to 100 km/h in 6 seconds and exceeds 200 km/h in 11.8 seconds

This vehicle is powered by a turbo V8 engine and reaches a top speed of 290kms/per hour

The Extreme Xx sports model is one of the fastest street legal vehicles permitted on Australian roads

You will be the envy of all your mates if you test drive one today

The road safety messages can accessed from: <http://dx.doi.org/10.1016/j.aap.2012.04.018>

## Appendix B

### Semi-Structured Interview Guide

Opening questions:

1. What do you think about current road safety campaigns?
2. What messages do you remember about these campaigns? Why?
3. Did these messages influence your own behaviour? Why/Why not?
4. Do you think that these messages would influence others? Why/Why not?

For each road safety message (i.e., physical gain, physical loss, social gain and social loss):

5. What are your first impressions of this message?
6. How does this message make you feel/think?
7. Do you think that this message would influence your own behaviour?
8. Do you think that this message would influence others?
9. How long would this messages influence your own behaviour?
10. Do you have any other comments or opinions that you would like to share about this message?

After viewing all four road safety messages:

11. Of the four road safety messages, which message(s) would you find most effective?

Vehicle advertisement:

12. What are your first impressions of this advertisement?
13. How does this advertisement make you feel/think?
14. Who do you think this advertisement was designed for?
15. Do you have any other comments or opinions that you would like to share about this advertisement?

# Review of contributing factors and interventions for dangerous driving

By Bianca Urquhart<sup>1</sup>, Andrew Day<sup>1</sup> and Gennady Baksheev<sup>1</sup>

<sup>1</sup>*School of Psychology, Deakin University, Geelong, Victoria 3220.*

Contributing author: [andrew.day@deakin.edu.au](mailto:andrew.day@deakin.edu.au)

## Abstract

This paper reviews published research relevant to understanding dangerous driving. A systematic search of relevant databases identified 117 papers that considered driving behaviour, but only 12 that specifically discuss factors that influence dangerous driving, motivations for dangerous driving, and/or interventions to improve road safety in dangerous drivers. The general findings of these studies are discussed, although it is concluded that the use of the term ‘dangerous driving’ by researchers is typically restricted to the driving behaviour of younger and/or novice drivers. As such a larger body of literature relevant to the topic will not be identified by searches that are restricted to the use of specific terminology. Nonetheless, these searches reveal that the best evidence exists for the implementation of Graduated Driver Licensing programs and the identified studies do highlight a number of key contributing factors that should be addressed in any attempt to reduce dangerous driving.

## Keywords

Dangerous driving, Interventions, Systematic review, Alcohol and Drugs, Graduated Driver Licensing

## Introduction

In 2004 the World Report on Road Traffic Injury Prevention identified that approximately 1.2 million people worldwide die each year as a direct result of crashes, and up to a further 50 million people are either disabled or injured. Although only a proportion of these crashes are a direct result of dangerous driving [1], road traffic accidents are the eighth leading cause of death in Australia [2].

The personal, social, and economic costs of crashes caused by dangerous driving are immense [3], highlighting the need to identify ways in which traffic related deaths and injuries can be prevented. A pre-requisite for the development of effective intervention, however, is an understanding of those variables that are associated with

dangerous driving, as well as knowledge about the features of the most effective interventions. The aim of this paper is, therefore, to systematically identify what is known about those factors that contribute to dangerous driving and to describe the types of interventions that have been shown to be the most effective.

## Methodology

A systematic review of the literature was conducted using methods consistent with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [16]. The Academic Search Complete database, one of the leading sources of peer-reviewed research in the Social Sciences and Humanities, was used to identify relevant papers and studies. Seven key terms were used (see Table 1), with each hit being classified into a final pool of studies after the abstract had been reviewed. The term ‘dangerous driving’ is widely used to refer to intentional risky driving, but has both lay and legal (e.g., the operating of a motor vehicle in a manner which has as one of its inherent qualities the exposure of the public to harm or injury) meanings. Accordingly, other search terms such as ‘hoon driving behaviour’ and ‘hoon attitudes’ were also used in an attempt to reflect the currency of this terminology in Australia (e.g., Victoria’s Road Safety Amendment [Hoon Driving] Act 2010).

To be retained in the final review, a paper needed to be: (i) peer reviewed; (ii) written in the English language; (iii) full text accessible; (iv) published between 2004 and 2014; and (v) consider factors that influence dangerous driving, motivations for dangerous driving and/or interventions to improve road safety in dangerous drivers. The reference lists of extracted articles were examined to identify relevant articles not identified in the initial searches. A total of 117 published papers met the search criteria, describing a range of different types of study (e.g., review articles, empirical studies) (see Table 1). Each paper was then manually reviewed, independently, by two researchers to establish the relevance of content to the aims of this review prior to inclusion.