The Role of Fear Appeals in Improving Driver Safety: A Review of the Effectiveness of Fear-arousing (threat) Appeals in Road Safety Advertising

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Abstract

This paper reviews theoretical and empirical evidence relating to the effectiveness of fear (threat) appeals in improving driver safety. The results of the review highlight the mixed and inconsistent findings that have been reported in the literature. While fear arousal appears important for attracting attention, its contribution to behaviour change appears less critical than other factors, such as perceptions of vulnerability and effective coping strategies. Furthermore, threatening appeals targeting young males (a high-risk group of concern) have traditionally relied on the portrayal of physical harm. However, the available evidence questions the relevance, and hence effectiveness, of strong physical threats with this group. Consequently, further research is required to determine the optimum way to utilise fear in road safety advertising, as well as the type of threat(s) most effective with different road users.

Keywords: Road safety advertising; fear appeals; driver safety.

Risky driver behaviours such as speeding and drink driving continue to represent significant contributors to road trauma, reflecting the perennial involvement of road user behaviour in road traffic injury. Whilst there is a growing body of evidence that traffic law enforcement programs, such as random breath testing and speed cameras, are effective in reducing illegal high-risk behaviours (e.g., Cameron, Cavallo & Gilbert, 1992; Homel, 1988), mass media advertising plays an important role in addressing these behaviours. Firstly, mass media advertising can be used to maximise the deterrent effects achieved by enforcement programs by heightening the driving public's perceived risk of apprehension (Elliott, 1992; Homel, 1988). Secondly, mass media advertising can work independently to educate and persuade road users to adopt safer behaviour(s) and related lifestyles. Consequently, ensuring that advertising approaches are achieving their persuasive goals is paramount.

Of the approaches utilised in road safety publicity campaigns, shock tactics, which aim to evoke strong fear responses in individuals, feature prominently (Tay & Watson, 2002; Tay, 1999). These shock-based, 'fear appeals' or more accurately, fear-arousing threat appeals[1] present individuals with the negative outcomes that they may experience as a result of engaging in the depicted unsafe and/or illegal behaviours. It is expected that the threat will evoke fear at the prospect of experiencing the aversive outcomes, which will in turn motivate the audience to align their attitudes and/or behaviours with those recommended in the message (Maddux & Rogers, 1983; Witte, 1992). Of the health issues that have utilised threat appeals, road safety is particularly renowned for its use of physical threats in which drivers and passengers are often shown to be injured and killed as a result of unsafe and/or illegal behaviour (Donovan & Henley, 1997; Rotfeld, 1999; Tay 2005a). Typically, these advertisements, in a graphically explicit manner, portray the crash scene and victims (Dejong & Atkin, 1995).

Despite their widespread use, the use of threat appeals (particularly those that invoke high levels of fear) in road safety remains contentious. For instance, some behavioural scientists as well as health promotion professionals and practitioners advocate the view that it may be best to avoid threat appeals or

[1] The more accurate term is threat appeals because fear is one possible emotional reaction individuals may have in response to a threatening stimulus (Donovan & Henley, 1997).

at the very least to use them with great caution (see Elliott, 2003; Elliott, 2005; Job, 1988; Shanahan, Elliott, & Dahlgren, 2000). Proponents of this view often cite the many inconsistent and mixed findings in the literature as well as the ethical concerns associated with deliberately evoking fear and anxiety in the attempt to persuade as justification of their position (Hastings, Stead, & Webb, 2004; Hyman & Tansey, 1990). In contrast, others have argued that under the correct circumstances the use of fear-arousing communications can be very effective (see Elliott, 2003; Witte & Allen, 2000). Proponents of both views acknowledge that many factors influence the relationship between fear and persuasion; however proponents of the first view are more likely to regard the existence of the many intervening variables as making the use of threat appeals too "risky" (Elliott, 2003, p. 2; Hastings et al., 2004; Hyman & Tansey, 1990) whilst proponents of the latter view are likely to argue that, although generalisations are difficult, understanding the factors that influence the relationship is the key to increasing the likelihood that a threat appeal will be effective.

Thus, the main aim of this review is to examine the role that fear appeals have played in improving driver safety; and, more specifically, the use (and effectiveness) of threat appeals in road safety advertising campaigns. Despite what may seem a rather straight forward task, it requires the synthesis of a large body of literature characterised by issues of long-standing debate and inconsistent findings (Ben-Ari, Florian, & Mikulincer, 2000; Bennett, 1996; Boster & Mongeau, 1984; Higbee, 1969; Janis, 1967; Janis & Feshbach, 1953; Elliott, 2003; Haefner, 1965; Insko, Arkoff, & Insko, 1965; LaTour & Rotfeld, 1997; Leventhal 1970; Leventhal & Watts, 1966; Ray & Wilkie, 1970; Sherr, 1990; Sternthal & Craig, 1974; Sutton, 1982; Sutton, 1992, Witte, Berkowitz, Cameron, & McKeon, 1998). Similarly, and of particular note for the current review, is the fact that inconsistent and mixed findings have also been reported in relation to driver-related threat appeals (e.g., Ben-Ari, 2000; Cameron et al., 1993; Cameron & Newstead, 2000; Cameron & Vulcan, 1998; Griffeth & Rogers, 1976; Guria & Leung, 2004; King & Reid, 1990; Kohn et al., 1982; Macpherson & Lewis, 1998; Oppe & Bijleveld, 2003; Rotfeld, 1999; Tay, 1999, 2004, 2005b,c).

Given the sheer volume of research that has examined the fear-persuasion relationship as well as the fact that a number of reviews and meta-analyses; have been conducted previously on the role of fear in persuasion (e.g., Boster & Mongeau, 1984; Dillard, 1994; Higbee, 1969; Job, 1988; Mongeau, 1998; Ray & Wilkie, 1970; Sternthal & Craig, 1974; Sutton, 1982;Witte, 1998; Witte & Allen, 2000), the main focus of this review will be on discussing the findings and limitations of research studies derived from or pertinent to the road safety advertising context. The review begins by highlighting the evolution of thinking that has occurred in relation to the fear-persuasion relationship which is best reflected by the theoretical development in the area.

Models of fear and persuasion

The earliest conceptualisations of the fear-persuasion relationship was based on drive theories which posited that fear appeals would evoke fear arousal and that fear, in turn, would act as a drive to motivate action (Witte & Allen, 2000). Linear and curvilinear views of the relationship between fear arousal and the amount of persuasion are underpinned by drive theories (Dillard, 1994; Witte & Allen, 2000). A number of early studies provided support for a positive linear relationship such that higher levels of fear arousal were the most conducive to persuasive attempts (e.g., Higbee, 1969; Insko et al., 1965; Leventhal & Watts, 1966).

However, other early studies provided evidence of a negative, linear relationship such that decreasing levels of fear (i.e., lower levels of aroused fear) resulted in more persuasion (e.g., Goldstein, 1959; Janis & Feshbach, 1953). Thus, although the linear perspective was parsimonious it was unable to account for these inconsistent findings. Consequently, the curvilinear (or inverted 'u') relationship was proposed as a means of reconciling the inconsistent findings (Janis, 1967; Ray & Wilkie, 1970). This view posited that higher levels of fear enhance persuasion up until some critical point; however, once this

critical point is exceeded the level of fear becomes too great and defensive avoidance reactions are likely to result, with subsequent rejection of the message more likely to occur. Some empirical support exists for the curvilinear view with studies indicating that fear is positively associated with both message acceptance and message rejection (Lewis, 2002; Tay & Watson, 2002).

Arguably, such findings highlight not only the particularly ambiguous nature of the fear-persuasion relationship but also a major criticism of the curvilinear view; namely, that empirical tests and refutations of the model are difficult (Leventhal, 1970). Given that fear is proposed to be positively associated with both message rejection and acceptance, the only explanation as to why one or the other occurs is that, in the case of rejection, the optimal level of fear is exceeded whilst in the case of message acceptance, the optimal level of fear has not been exceeded. Thus, a key construct underpinning the curvilinear view is the notion that some *optimal level of fear* exists (e.g., Janis, 1967).

The location of this point of optimal fear level was believed to be determined by a number of potential moderator variables including situational, content, and dispositional factors (Boster & Mongeau, 1984; Dillard, 1994). The acknowledgement that other factors influenced the fear-persuasion relationship confirmed the complexity and ambiguity of the relationship and subsequently contributed to the development of more complex models to better explain the extant research findings.

Generally, these 'newer' models adopted a greater focus on the role of cognitive factors as opposed to a specific focus on the role of fear. One of the first models to do this, the Parallel Response Model [PRM; Leventhal, 1970) maintained that there were two separate paths to persuasion: an emotional 'fear control response' and a cognitive 'danger control response'. Of the two paths, the cognitive response, by controlling the danger or threat, was more likely to promote protective behaviour (i.e., adoption of the message's recommendations) as opposed to the emotional response which involved controlling the fear by either maladaptive means such as mimising the threat (i.e., rationalising the risk) or rejecting the message. However, the model failed to clearly specify the circumstances under which danger control or fear control responses would be initiated (Witte & Allen, 2000).

The Protection Motivation Theory ([PMT; 1975; 1983) developed by Rogers, featured and even stronger focus on cognitive factors. The PMT[2] incorporates four variables: the perceived severity of the threat; the perceived probability that the threat will occur (often referred to as vulnerability and/or susceptibility); the perceived efficacy of the recommended response (more commonly referred to as response efficacy); and the perceived efficacy of individuals to enact the recommended response (more commonly referred to as message self-efficacy).

More particularly, the four variables function to facilitate one of two cognitive appraisals: severity and vulnerability are regarded as the threat appraisal whilst the variables, response efficacy and message self-efficacy comprise the coping appraisal. Message acceptance is a function of the level of protection motivation produced by the two appraisals; whereby the relationship between variables within each respective appraisal is considered additive whilst the relationship between the two appraisals is considered multiplicative (Rogers, 1983; see also Maddux & Rogers, 1983). For instance, high perceptions of both efficacy and threat produce the most protection motivation and subsequently, the most message acceptance. Of particular note, is the extent that the role of fear is minimised in the model. Specifically, fear is proposed as functioning to influence message acceptance (i.e., persuasion) only indirectly through intensifying the perceived severity of the threat (Rogers, 1983). The model has been extensively utilised and tested (e.g., Floyd, Prentice-Dunn, & Rogers', 2000 meta-analysis of research on PMT). However, whilst the model has been regarded a sound approach to explaining how and when threat messages are successful, it has been criticised for not providing explanation as to how and why they may fail (Witte & Allen, 2000).

Consequently, Witte developed the Extended Parallel Process Model ([EPPM], 1992) as a framework to explain not only when threat appeals are successful but also why they fail (Witte, 1992; Witte & Allen, 2000). The EPPM incorporates elements from some of its theoretical predecessors. Specifically, it incorporates the parallel process first posited by Leventhal's (1970) PRM and the concept

[2] The more recent version of Rogers' PMT from 1983.

of protection motivation including the variables of severity, susceptibility, response efficacy, and message self-efficacy (and the relationships between the variables[3]) from Rogers' (1983) PMT.

Specifically, the EPPM posits that an individual's response to a potentially threatening message involves two distinct appraisals. The first appraisal relates to the degree to which the message is perceived as being threatening. If the individual perceives that they are personally vulnerable to the message, a second, coping, appraisal occurs. In other words, the extent to which they fear the threat, determines whether they are motivated to continue processing the message. In turn, the coping appraisal may initiate a danger control (cognitive) process, a fear control (emotional) process, or the ignoring of a message.

More specifically, if the threat is perceived as high (i.e., perceptions of personal vulnerability and threat severity are high), then there is greater motivation to evaluate the efficacy inherent in the message. If, in turn, efficacy is high (i.e., perceptions that the recommendations of the message and their ability to enact them as high), then cognitive processing and protection motivation is adopted. In other words, adaptive behaviours are adopted and the appeal may be regarded successful. Alternatively, if the threat is perceived as high (i.e., high severity and personal vulnerability perceptions) but perceptions of efficacy are low (i.e., individuals do not believe that they could successfully enact the strategies), then emotional processing occurs whereby an individual will aim to control their fear through maladaptive strategies such as denial or avoidance. The final outcome possible in the EPPM is where individuals simply ignore the message. This outcome is likely to occur in instances where individuals' perceptions of a threat are low because it is regarded as irrelevant. Consequently, there is no motivation for continuing with any processing of the message (Witte, 1992; Witte & Allen, 2000). It should be apparent from the preceding description that coping appraisal determines whether individuals will be motivated to control the danger of the threat or control their fear about the threat, whereas threat appraisal determines whether individuals continue further with processing the message.

Overall, theoretical development in the fear-persuasion literature has reflected the attempt to provide sound explanatory frameworks for what has become recognised, on account of the inconsistent and ambiguous findings, as an increasingly complex relationship. Of note is the changing nature of the perceived role of fear in the different models. For instance, unlike the PMT in which the role of fear is posited as rather minimal and indirect (i.e., influencing perceptions of severity only), the EPPM proposes a more significant role for fear. Specifically, fear is important for motivating further processing of a message which includes functioning to attain interest in a message (Witte, 1992). To the extent that individuals are unlikely to be persuaded by a message that they do not attend to, fear may be regarded as performing an important role in persuasion.

Consistent with this notion, a study of drivers' perceptions of the role (and effectiveness) of different types of road safety advertisements found that fear-based appeals were regarded as relatively more 'attention-grabbing' and 'attention-retaining' than other approaches (Lewis, Watson, White, & Tay, 2007a; see also Tay & deBarros, 2006; in press). A recent meta-analysis (i.e., Witte & Allen, 2000) has identified a small but, reliable correlation between fear arousal and persuasion (i.e., attitudes, intentions, and behaviour) which supports the finding of a previous meta-analysis (i.e., Boster & Mongeau, 1984). Thus, fear does have a role to play in persuasion although the magnitude of the correlation suggests that fear arousal is not the only explanatory factor. Indeed, the more contemporary and most often cited models, namely Rogers PMT and Witte's EPPM, have identified key cognitive factors/processes that influence the fear-persuasion relationship rather than focusing predominantly on the emotion of fear.

Some key factors influencing the fear-persuasion relationship

Although threat appeals had been used in road safety advertising campaigns for over 40 years (Berkowitz and Cottingham, 1960; Griep, 1970; Farmer, 1974; Atkin, 1979; Robertson, 1976; Griffeth &

[3] Similar to Protection Motivation theory (Rogers, 1983), the Extended Parallel Process Model (Witte, 1992) maintains that the relationship between variables within each appraisal (i.e., susceptibility and severity in the threat appraisal and response efficacy and message self-efficacy in the coping appraisal) is additive whilst the relationship between the two appraisals is multiplicative.

Rogers, 1976; Boyle, 1984), in Australia, the use of such appeals became more prominent in the early 1990's when the Victorian Transport Accident Commission [TAC] launched highly emotive and graphically hard-hitting advertisements depicting scenes of road carnage. The TAC received international recognition for this campaign (Donovan, Jalleh, & Henley, 1999). An implicit assumption underpinning these high threat appeals was that more fear equated to more persuasion (Tay & Watson, 2002). The graphic nature of the advertisements served to heighten perceptions of threat, and in particular, highlighted the severity of potential outcomes of 'unsafe' and/or illegal driving behaviour(s) as well as the possibility that "it could happen to you" (i.e., increased perceptions of vulnerability).

Donovan et al. (1999) examined the reported intentions of a sample of shoppers after being exposed to a range of different advertisement types for different driving behaviours (i.e., speeding, drink driving, fatigue, inattention). The study sought to determine whether the highly emotive, graphic threat appeals, which were more expensive to produce than other advertisement types (i.e., talking heads testimonials), were more effective than their relatively less expensive (and less threatening) counterparts. Overall, the authors concluded that there was no consistent evidence to suggest that the highly expensive, highly emotional threat appeals were the most effective and best option: some high threat appeals performed well whilst others, of equivalent design costs, did not perform as well as their less expensive counterparts addressing the same behaviour (Donovan et al., 1999).

This finding is not that surprising in light of a growing body of research that suggests that increasing perceptions of severity may not be as important to the effectiveness of threat appeals as increasing perceptions of susceptibility (Das, de Wit, & Strobe, 2003; de Hoog, Stroebe, & de Wit, 2005; Henley & Donovan, 2003; Pechmann, Zhao, Goldberg, & Reibling, 2003; Ruiter, Abraham, & Kok, 2001). Whilst meta-analytical evidence has suggested that both severity and susceptibility are positively related with message acceptance (Floyd et al., 2000; Witte & Allen, 2000), ensuring that a threat is regarded as personally relevant by members of the target audience appears to be a key moderating factor (LaTour & Rotfeld, 1997; Rotfeld, 1999).

Moreover, susceptibility has been shown to have greater impact on changes in intentions and behaviour (i.e., change in the direction of greater alignment with recommendations of a message) than fear arousal (de Wit et al., 2005; see also Floyd et al., 2000). This suggests that the key to behavioural change lies in creating susceptible threats as opposed to relying on fear arousal to motivate change. This notion of identifying personally relevant threats for particular target audiences is consistent with market segmentation which suggests that different audiences are likely to respond more or less effectively to particular threats (LaTour & Rotfeld, 1997; Quinn, Meenaghan, & Brannick, 1992; Rotfeld, 1999). Moreover, it acknowledges the fact that individuals fear different threats and to varying extents. Consequently, for a threat appeal to be effective it is essential that the *optimal type of threat* is utilised (Quinn et al., 1992; Rotfeld, 1999).

Whilst, road safety has tended to rely heavily upon physical threats of injury and death (i.e., "commercials of death"; Tay & Watson, 2002), threats may also be social, psychological, or financial (Donovan & Henley, 1997). Evidence suggests that the frequent use of physical threats in road safety advertising may be problematic given that such appeals may not be regarded relevant, and hence persuasive, by those road users most commonly targeted; namely, males and young males. For instance, several studies have found that a strong physical threat (i.e., where death of a passenger was the aversive outcome 'threatened' as resulting from illegal and/or dangerous driving) was more effective with female participants than males, with the males reporting significantly less intention to align their future speeding and drink driving behaviour with the recommendations made in the messages (Lewis, Watson, & Tay, 2007b, Tay & Ozanne, 2002). Moreover, the male participants were also more likely to report that the messages would influence the behaviour of other drivers than themselves. Similarly, another study found that whilst a fear-based advertising campaign effectively reduced drivers' reported intentions to drink and

drive, the impact of the campaign was weakest on young males – the main intended target audience for the messages (Tay, 2002).

These results suggest that, despite often being the intended audience of many advertisements (Tay, 2002; 2005), young males appear to be less persuaded by appeals involving physical threats, perhaps because they feel less vulnerable to such threats. Consistent with this suggestion, evidence that social threats (e.g., threat of losing licence and the social stigma attached to licence loss) may be an effective threat appeal alternative, particularly for younger individuals (including younger drivers), is accumulating (Kohn et al., 1982; Lewis et al., 2007a; Pechmann & Knight, 2002; Pechmann et al., 2003; Rotfeld, 1999; Schoenbachler & Whittler, 1996; Wiley, Krisjanous & Hutchings, 2002).

Interestingly, whilst evidence derived from the road safety advertising literature suggests that demographic characteristics such as the age and gender influence the effectiveness of threatening messages, such findings are inconsistent with those reported by a recent meta-analysis of threat appeals in health advertising generally. Witte and Allen (2000) noted that, "individual differences do not appear to have much influence on the processing of fear appeals…generally, studies have found no effect on acceptance of fear appeal recommendations due to gender, age, ethnicity, or group membership (Witte & Allen, 2000, p. 602). This discrepancy highlights some of the inherent inconsistencies among studies examining the influence of moderating factors. Furthermore, such evidence attests to the complexity of the fear-persuasion relationship and the care that needs to be undertaken with respect to identifying the specific threat and the target audience when utilising threat-based appeals (Burnett and Oliver, 1979; Florian & Mikulincer, 1997).

Extending upon this issue, whilst identifying the most relevant threat for a particular audience increases the likelihood that a threat appeal will be effective, it is important to note that this does not necessarily ensure that the target audience will be persuaded. Certain evidence suggests that in some instances threat appeals that are "too relevant" may also be ignored and rejected by those most in need of change (see Higbee, 1969; Phau, 2000; Quinn, et al., 1992). Similarly some findings derived from anti-smoking messages have indicated that threat appeals may be more effective with those individuals not engaging in the behaviour and thus those already "converted" to the recommendations espoused in a message (Phau, 2000; Quinn et al., 1992).

Furthermore, evidence from the road safety literature suggests that factors such as sensation seeking and biases are likely to influence perceptions of relevance. For instance, a substantial body of literature attests to the fact that high sensation seekers are more likely than non-sensation seekers to engage in a range of risky and illegal driving behaviours (Beirness, 1993; Jonah, Thieseen, Au-Yeung, 2001; Zuckerman, 1994) which place them at heightened risk of being injured on the road. However, despite their increased risk (and greater personal relevance with the behaviour), evidence derived from HIV/AIDS advertisements (Witte & Morrison, 1995) as well as road safety advertisements (Champness, 2001; Tay, Champness, & Watson, 2004) indicates that threats of injury or death are not effective with high sensation-seeking individuals.

Additionally, a number of psychological biases appear to influence driver perceptions relating to the likelihood of being involved in a road crash or being detected for illegal behaviours. For instance, optimism bias (Weinstein, 1980) as well as a perception that one is a "better" than the average driver[4] (Delhomme, 1991; McKenna, Stanier, & Lewis, 1991) contributes to the belief that "bad outcomes won't happen to me (including being involved in a road crash; see Van der Plight, 1996)". In turn, such beliefs

[4] Walton and Bathurst (1998) found support for the Downward Comparison Theory whereby drivers consider other drivers negatively rather than exaggerating their self-perceptions.

can lead individuals to perceive that a threat is personally irrelevant (see Walton & McKeown, 2001 who found this tendency with speed-related messages).

Indeed, consistent with the belief that "bad outcomes won't happen to me", studies examining the influence of anti-speeding and anti-drink driving appeals have found evidence that a third-person effect influences the persuasiveness of such appeals (Lewis et al., 2007b). The third-person effect (TPE) is a perceptual disparity whereby individuals deem a persuasive message as being more likely to influence others in general than themselves (Davison, 1983).

Furthermore, another study exploring individuals' acceptance of anti-speeding physical threat-based appeals found that, drivers who believed that they drove faster than average tended to accept that the messages were directed at them; whilst, those who believed that they drove slower than the average driver believed that the messages were directed at others (Walton & McKeown, 2001). However, whilst this finding at first may seem encouraging, the study also revealed a perceptual disparity such that most drivers falsely believed that they drove slower than the average driver and tended to greatly exaggerate the usual speeds of others.

These findings highlight the complexity of using threat appeals to modify driver behaviours, as well as the difficulties involved in designing personally relevant threats. Indeed, some researchers have questioned whether optimism biases can be reduced and that, since physical threat appeals appear not to address these biases, other persuasive approaches may need to be examined (see Harré, Foster, & O'Neill, 2005). Of note, it has been suggested that an important component of designing a threat appeal is to ensure that thorough pre-testing and qualitative research is conducted to examine such aspects as the relevance of the message with the intended target (Ben-Ari et al., 2000; Donovan et al., 1995).

Therefore, on balance, the evidence regarding the role of threat susceptibility and severity (both in general and from road safety studies), suggests that perceptions of vulnerability are more critical to persuasion than fear arousal (e.g., de Hoog et al., 2005). However, threat appeals can backfire even in the case that a personally relevant and severe threat is identified and especially in situations where limited coping strategies are provided (e.g., Witte & Allen, 2000). Indeed, the available evidence suggests that one of the best means of increasing the likelihood that a threat appeal will not backfire is to ensure the inclusion of coping strategies (as discussed previously these are referred to in the literature as response efficacy). Recent evidence has identified efficacy (response and message self-efficacy) as the most significant predictor of a threat appeal's effectiveness (Floyd et al., 2000; Tay & Watson, 2002). The inclusion of coping strategies provides individuals with a potential means of controlling the threat and, as such, if an individual believes that they can effectively enact such recommendations, they are more likely to control the threat or danger (i.e., enact adaptive coping strategies) than deal with it through denial or avoidance of the message (i.e., enact maladaptive coping strategies). In this regard, a number of recent studies support the importance of providing high levels of efficacy not only to increase the level of message acceptance but, to also reduce the likelihood that a threat appeal will backfire (see Rossiter & Thornton, 2004; Stephenson & Witte, 1998; Tay & deBarros, 2006; Tay & Watson, 2002; Tay et al., 2004; Witte & Allen, 2000).

Moreover, empirical evidence, derived from the road safety advertising context specifically, attests to the importance of efficacy in influencing behavioural intentions (e.g., Rogers & Mewborn, 1976; Tay & Watson, 2002; Tay et al., 2004) as well as longer-term self-reported behavioural change (Tay & Watson, 2002; Tay et al., 2004). The studies which have reported changes in intentions and behaviour (self-reported) were based on threat-based fatigue advertisements (Tay & Watson, 2002) and anti-speeding and anti-drink driving advertisements (Tay et al., 2004). Perhaps, more significantly, Tay and Watson (2002) found that response efficacy was the only significant influence on intentions and behaviour one to two weeks after exposure to the advertisement. The authors concluded that, "…it

appears that a key to achieving and sustaining behavioural change lies more in providing the audience with good coping strategies and not simply relying on fear as a source of motivation" (Tay & Watson, 2002, p. 65).

In summary, according to the PMT and the EPPM, severity, susceptibility, response efficacy, and message self-efficacy represent four of the key moderators of the fear-persuasion relationship. Although empirical research has shown each of these factors to be positively related to message acceptance (e.g., Floyd et al., 2000), a growing body of research has highlighted the relatively greater importance of susceptibility and efficacy (e.g., de Hogg et al., 2005[5]; Rossiter & Thornton, 2004; Stephenson & Witte, 1998; Tay & Watson, 2002). Therefore, in order to increase the likelihood that a threat appeal is effective (and minimise the possibility that it will fail), it must raise perceptions of personal vulnerability and it must incorporate effective coping strategies. However, a myriad of other factors are also likely (and have been found) to influence the effectiveness of threat appeals beyond the factors identified in the PMT and EPPM. The following section will focus particularly on factors likely to influence the effectiveness of threat appeals in the road safety context.

Factors influencing the effectiveness of threat appeals in road safety

As noted previously, road safety advertising campaigns in Australia have long relied upon threat-based appeals as one of the most popular persuasive approaches. However, evidence of a wear-out effect of such advertisements has been reported. For instance, one study based on focus group discussions with drivers found that drivers reported growing increasingly tired of the "shock" approach in road safety advertisements. Further, they suggested that modern society is no longer is shocked by scenes of carnage in such advertisements because such tactics are now more commonplace (Lewis et al., 2007a). Given that it is unlikely that individuals will be persuaded by advertisements that they do not attend to, the possibility exists that such appeals are likely to be less effective overall, irrespective of how well they are designed.

Additionally, factors such as the credibility and realism of road safety threat appeals are likely to be undermined (thus reducing the effectiveness of such appeals) by the fact that, in reality crashes are rare events and that it is unlikely that an individual will be detected for speeding or drink driving on every occasion that they engage in the behaviour. Consequently, threats of being physically harmed and/or being detected for engaging in unsafe or illegal behaviour may come to be perceived as less credible and realistic over time. These factors, in addition to an array of other message characteristics (see Harrison & Senserrick, 1999) are often varied in threat appeals, which may consequently confound research findings (Job, 1988; Sherer & Rogers, 1984; see also Leventhal, 1970). In addition, while the perceived personal relevance of a threat is often measured, other factors such as credibility and realism are not always measured and may also serve to confound results.

Common problems inherent to threat appeal research

A major methodological problem inherent in many studies in the area is the assumption that threat appeals are generally successfully in evoking fear and that this is the only emotional response elicited by exposure to the threat (Dillard et al., 1996; LaTour & Rotfeld, 1997). Evidence has shown that threat-based appeals in road safety advertising do evoke a range of negative emotions other than fear such as guilt and remorse (see Harrison & Senserrick, 1999). However, despite evoking a range of emotions, rarely do empirical studies examine the relationship between these additional emotions and persuasion despite the fact that evidence exists that has shown different discrete emotions do have differential persuasive effects: some inhibit whilst some facilitate persuasion (Dillard et al., 1996; Dillard & Peck,

[5] de Hogg et al. (2005) found that changes in intention and behaviour (relating to Repetitive Strain Injury) were solely determined by vulnerability as opposed to severity or response efficacy. This finding is interesting as it attests to the overall significance of vulnerability relative to all other constructs.

2000). Most critically, if a study does not take precautions to ensure that a message is indeed fear-evoking (such as measuring the change in levels of fear and/or performing a manipulation check), then any conclusions drawn are likely to be erroneous. In other words, if fear was not successfully evoked, or alternatively, if different emotions other than fear were evoked, then the study is no longer examining the relationship between the emotion of fear and subsequent persuasion.

A related issue highlighted in the preceding point and representing one of the most commonly cited flaws in the fear appeal literature is the misuse of the terms "fear" and "threat". Although the terms tend to be used interchangeably in the literature they are conceptually different constructs with fear being a possible *response* to a threatening *stimulus* (Donovan & Henley, 1997; LaTour & Rotfeld, 1997). Consequently, the most appropriate terminology is a threat appeal rather than a fear appeal (Donovan & Henley, 1997; Elliott, 2003; LaTour & Rotfeld, 1997).

Further, as noted previously, fear represents only one type of emotional response that may or may not be evoked in response to a threat (Dillard et al., 1996). Despite this distinction, studies often refer to fear as a stimulus (i.e., a manipulation of different levels of fear is referred to) without actually measuring the level of fear arousal among the participants. Beyond this definitional ambiguity, omissions and a number of methodological limitations exist in the threat appeal literature (generally, as well as in the road safety advertising context more specifically) that have produced gaps in contemporary understanding about the effectiveness of threat appeals.

Gaps in current knowledge and limitations in the literature

Omissions. It has been suggested that the lack of clear empirical support for the use of threat appeals in road safety advertising is due to both the paucity of studies in general, as well as the mixed and inconsistent findings that have been reported (Ben-Ari et al., 2000; Donovan et al., 1995). Moreover, of the studies that have been conducted many have tended to examine threat appeals that address the behaviour of drink driving (Dillard & Peck, 2000; Kind & Reid, 1990; Lewis et al., under review; Tay, 1999, 2002, 2005a,b,c; Tay et al., 2004). This criticism is supported by the fact that comprehensive reviews of advertising countermeasures in road safety exist for anti-drink driving messages but not other behaviours (Dejong & Atkin, 1995; Elder et al., 2004; Vingilis & Coultis, 1990).

Nevertheless, it does not mean that the effectiveness of threat appeals in relation to other driving behaviours has not been examined. For example, Ben-Ari et al. (2000) examined reckless driving; Donovan et al, (1999) analysed speeding, inattention, fatigue, and drink driving; Lewis et al.(2007b) and Tay et al. (2004) investigated speeding and drink driving; Rossiter and Thornton (2004) and Tay (2004) examined speeding; and Tay and Watson (2002) studied driving while fatigued.

However, a large part of what is currently known about driving-related threat appeals has tended to be based on the behaviour of drink driving. This is problematic since other evidence suggests that there are important differences between drink driving and other high-risk behaviours and, more importantly, the means of addressing such behaviours are also different (Tay, 2005b). For instance, appeals focusing on behaviour of drink driving have the opportunity to focus on a range of coping strategies (e.g., designated driver, taking public transportation) by contrast, few strategies are available in relation to speeding (i.e., the main strategy to avoid speeding is not to speed; Donovan et al., 1995; Tay, 2005b). Given the importance of efficacy to the effectiveness of threat appeals, it is likely that different behaviours are likely to be influenced by different strategies.

Message rejection ignored. Message rejection refers to the extent that threat appeals fail. When it is measured, studies typically assess the extent to which individuals report that it likely that they would defensively avoid, deny, or ignore a threat message (i.e., maladaptive coping strategies are measured; see Lewis et al., 2007b; Tay et al., 2004; Tay & Watson, 2002; Witte, 1994). However, compared with the

concept of message acceptance, limited attention has been given to the measurement of message rejection. This tendency is problematic because theoretical (see Witte's EPPM, 1992) and empirical (Tay & Watson, 2002; Tay et al., 2004) evidence has shown that message acceptance and message rejection are not mutually exclusive outcomes.

Furthermore, empirical evidence based on road safety threat appeals addressing driver fatigue (Tay and Watson, 2002) as well as speeding and drink driving (Tay et al., 2004) found that fear arousal was positively correlated with both message acceptance and rejection; however, only the correlation with rejection was significant (Tay & Watson, 2002). The conclusion drawn by the researchers from these studies was that reductions in fear would not adversely influence acceptance rates but, could potentially decrease rejection rates. Therefore, the inclusion of measures of message rejection in addition to measures of message acceptance would provide a more accurate and comprehensive understanding of the effectiveness of a threat appeal.

Measures of message acceptance. Due to the fact that specific mass media campaigns are designed according to their own respective persuasive goals, message acceptance can be operationalised in a range of ways including: changes in self-reported attitudes, intentions, or behaviour or changes in observed behaviour (see Elliott, 1993). Consequently, studies evaluating the effectiveness of threat appeals are often based on different outcomes rendering comparisons across studies difficult.

Moreover, in road safety advertising research on threat appeals, many studies have relied upon self-reported behavioural intentions as the primary measure of message acceptance (see King & Reid, 1990; Lewis et al., 2007b; Rogers & Mewborn, 1976; Tay, 2002); although self-reported behaviour has been assessed in some studies (Kohn et al., 1982; Lewis et al., under review; Tay et al., 2004; Tay & Watson, 2002). However, while intentions are a good predictor of behaviour, they are far from a perfect measure. Indeed, recent meta-analytical research has indicated that a medium to large intentional change ($d = 0.66$) leads to a small-to-medium behavioural change ($d = 0.36$) (Webb & Sheeran, 2006). To the extent that road safety and other health-related interventions are implemented in an applied context, outcomes of practical significance are most significant.

Moreover, studies that have included an objective measure of behaviour via the use of a driving stimulator have produced inconsistent findings. For instance, one study found that whilst threat appeals led to less reported intentions of reckless driving they also led to higher driving speed on a simulator[6] (Ben-Ari et al., 2000). In contrast, an earlier study reported that fear arousal "…was highly effective in suppressing braking, steering, and speeding errors" (Griffeth & Rogers, 1976, p. 505). In one of the few studies that examined actual driving behaviour, Tay and deBarros (2006) found that anti-speeding messages displayed on variable message signs induced only a small to moderate change in speeding behaviour on the highway. Consequently, such inconsistent findings make it difficult to draw definitive conclusions.

An additional concern relating to the operationalisation of message acceptance is the self-report nature of many of the measures utilised. Whilst the biases associated with self-reported data are not particular to threat advertising research, because road safety advertising research often requires individuals to report on their engagement in illegal behaviours, it is reasonable to presume that the reported data may be influenced by social desirability biases. Additionally, discrepancies have been found between self-reported behaviour and actual behaviour (Evans et al., 1970).

[6] These results were found for drivers who scored high in the driving as relevant to self-esteem scale (see Ben-Ari et al. 2000).

Study design and sample issues. Limitations relating to the design and participant samples of research studies tend to reduce the generalisabilty of findings. For instance, fear appeal literature in general has been criticised for its over-reliance on student samples (Hastings et al., 2004). The extent that findings may be generalised to the broader population remains largely unknown. Similarly, much of what is known about threat appeals in road safety advertising has been based on studies conducted with student samples (Elliott, 2005; e.g., Dillard & Peck, 2000; King & Reid, 1990; Kohn et al., 1982; Rogers & Mewborn, 1976; Lewis et al., 2007b). Consequently, similar concerns surrounding the generalisability of findings to the general driving public exist (Elliott, 2005).

Also serving to reduce the generalisability of research findings is the fact that most research studies in the fear appeal literature have been based on laboratory studies as opposed to field studies (Elliott, 2005; for an exception see Donovan et al., 1999). Although laboratory studies offer heightened internal validity they do represent rather artificial, contrived settings. This type of setting is particularly troublesome for advertising research because it may force participants to attend to or watch a message that they would not typically watch in their general life (Hastings et al., 2004).

Taking these limitations and omissions into consideration, it is apparent that gaps do exist in contemporary understanding of the extent that fear appeals specifically has been instrumental in improving driver safety. The theoretical and empirical evidence generally suggests that fear itself may be important for capturing attention; however, is not the sole, or even, key factor determining the effectiveness of an advertisement. It has been shown that emotional advertising campaigns are more effective than rational, information-only advertisements (Flora & Maibach, 1990). Thus, it appears that whilst emotion is an important component of advertisement effectiveness the critical issue is the need to determine which type of emotion is the most effective. Currently, the authors of this manuscript are examining whether other emotions, including more positive emotions and the modelling of safe behaviour (and the positive emotions associated with depiction of such positive behaviour), represent effective persuasive alternatives. The possibility of using more positive reinforcement and rewards in road safety initiatives generally, as well as in advertising more specifically, represents a rather contentious issue. However, it has been suggested and advocated by others in the road safety arena (see Elliott, 1992; 2003; 2005; Job, 1988).

Conclusion

The prevailing viewpoint among some behavioural scientists and health promotion professionals and practitioners is to avoid threat appeals or to use them with great caution (Elliott, 2003; Elliott, 2005; Shanahan et al., 2000). Similar to the fear-persuasion literature in general, mixed and inconsistent findings have been reported in relation to threat appeals utilized in the road safety advertising context (Ben-Ari et al., 2000). Whilst innumerable attempts have been undertaken to reconcile the disparate findings through identifying key moderating factors and methodological limitations of the available studies, the fact that so many other intervening factors influence the fear-persuasion relationship has lead some to suggest that the use of such appeals is too risky and complicated (Elliott, 2003). The most consistent and definitive conclusions appear to be in relation to the importance, not of fear arousal but, of relevance (i.e, vulnerability) and provision of coping strategies and recommendations that an individual can effectively enact to avoid or prevent a threat from occurring (i.e., efficacy).

Moreover, the concern associated with the frequent use (and preference) of strong physical threats to target young males was highlighted. For instance, it was suggested that, “eliciting fear of personal death may not be always necessarily the most appropriate way to change dangerous behaviour” (Ben-Ari et al., 2000, p. 8; see also Henley & Donovan, 2003). Given that young males represent a high risk road user group yet, appear less influenced by physical appeals intending to target them (Lewis et al., 2007b; Tay, 2002), this evidence provides perhaps one of the most significant challenges to the effectiveness and

continued use of strong (physical) threat appeals in the road safety context. Consequently, it seems more than justified to explore the effectiveness of alternative approaches (which may or may not be threat-based). Any reductions in the road trauma among this high risk road user group would have significant implications not only for road safety but for public health generally.

In conclusion, without doubt, the issue of whether or not to use threat appeals in road safety advertising as well as health advertising more generally, will continue to be contentious and prompt debate among researchers and practitioners. Perhaps, the most sound recommendation for anyone considering the use of threat appeals is to ensure that thorough pre-testing and qualitative research be conducted to examine the relevance of the intended message among the target audience as well as to ensure that it elicits high levels of efficacy and vulnerability.

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