Message Frame and Threat in the Social Marketing of Sustainable Behaviour for Youth

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ABSTRACT

Strengthening social marketing can play an important role in bridging the knowledge-action gap in adolescents. Message framing, based on the prospect theory in psychology, is used in social marketing to manipulate perceived behavioural outcomes and has proved successful in health-related campaigns. Using a 2 x 2 between-subjects factorial design, this study tested the effectiveness of message framing on influencing sustainable behaviour by examining the interaction of frame (gain vs. loss) and threat (social vs. physical) in ads discouraging adolescents from the case behaviour of personal vehicle use. Data were collected through a 27-item questionnaire from 250 high school-aged youth who were randomly assigned to one of four treatment conditions. After viewing a print ad, participants reported their affective arousal, perceived beneficial importance of driving, and intentions and attitudes toward driving. Overall, loss-framed messages were found to be more effective than gain-framed messages in producing negative emotions and lowering intentions to drive. The interaction of frame and threat factors had a significant effect on driving attitudes. On the perception of driving as beneficial and important, physical loss and social gain ads were found to be most persuasive. The results suggest that females may be more persuaded by social loss framing, and gain frames may be more effective for adolescents who are already engaging in environmentally sustainable behaviour. When designing future social marketing campaigns for youth, frame and threat factors as well as segmentation of the adolescent population should be taken into consideration.
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1.0 INTRODUCTION

Human impacts on the environment and the unprecedented acceleration of environmental change have been of interest to scholars over the past century. Rising awareness of the effects of human resource consumption on the biosphere has alerted humanity to our role in modern environmental problems, including climate change, deforestation, oil shortages, acid rain, waste disposal, habitat loss, and air and water pollution (Draper & Reed, 2005, p. 6). As a result, the environmental crisis is becoming increasingly recognized as a social, economic, and political problem which requires a solution that involves actions and initiatives geared towards environmental sustainability at both the individual and collective level (Kennedy, Beckley, McFarlane, & Nadeau, 2009).

In terms of individual level factors, widespread behavioural change throughout the population is necessary to stem the environmental crisis (DeYoung, 1993; McKenzie-Mohr, 2000). Accordingly, research in applying behavioural theories to encourage conservation and sustainable behaviours such as litter control, increasing recycling participation, and encouraging energy efficiency has soared over the past half-century. As of late, however, Lehman and Geller (2004) have noted that the presence of research on promoting environmental behaviours in the literature has begun to decline and the field is far from reaching its potential. In addition, they assert that existing studies have had limited impact in solving real-world environmental problems (Lehman & Geller, 2004).

This paradox is certainly visible within the Canadian population. Despite widespread awareness of and concern for the environment, individuals still seldom engage in environmentally sustainable behaviours, such as reducing consumption, increasing resource efficiency, purchasing local and/or organic products, or getting involved in community initiatives
(Davis, 1995; Kennedy et al., 2009; Pelletier & Sharp, 2008). This “knowledge-action gap” is a cross-cultural phenomenon that has mystified scholars for decades; indeed, hundreds of studies have failed to definitively explain the discrepancy (Kollmuss & Agyeman, 2002). Even in self-reports, the majority of Canadians acknowledge the conspicuous gap between their own environmental values and their actions (Kennedy et al., 2009).

Among the adolescent population, research has been equivocal and lacking on the relationship between environmental attitudes and behaviours. Whereas some studies have found that environmental attitudes can predict environmentally sustainable behaviours in adolescents (Meinhold & Malkus, 2005), others have confirmed the presence of the knowledge-action gap within this demographic (Creech, Buckler, Innes, & Larochelle, 1999; Fien, Neil, & Bentley, 2008). Increasing attention among researchers on youth civic engagement indicates a growing recognition that adolescents, who are at the critical stage when lifestyle habits are formed and maintained, have an enormous capacity to drive cultural change (Watts & Flanagan, 2007). Thus, reaching the youth population and realizing their potential to become change agents for sustainability is imperative in establishing long-term societal behaviours that benefit the environment (Bird & Tapp, 2008; Fien et al., 2008).

Given the knowledge-action gap, researchers have concluded that the problem no longer lies in a lack of awareness about the environmental crisis (Davis, 1995; Pelletier & Sharp, 2008). Over the past decade, the environment has been a focus of the public policy agenda and the mass media. However, as the knowledge-behaviour gap would suggest, increased information alone is not enough to compel participation in environmentally sustainable behaviours (Kennedy et al., 2009; McKenzie-Mohr, 2000; Neukom & Ashford, 2003). To bridge this gap, we must examine not only the availability of information about environmental problems, but also how it is being
communicated. This study therefore examines how such communications can be more effectively tailored to the adolescent population to encourage environmentally sustainable behaviours.

Certainly, many approaches to promote environmentally sustainable behaviours have been attempted. These include using religious and moral appeals, information-intensive campaigns, economic incentives, and community management that relies on shared rules and expectations (McKenzie-Mohr, 2000; Stern, 2000). On their own, these methods have demonstrated limited effectiveness; given that behaviours are shaped by interacting variables, a combination of these approaches is most effective (Stern, 2000). Since the 1960s, the field of social marketing has emerged as a viable and effective alternative to traditional persuasive communications, particularly in the domain of health behaviours. Social marketing is the application of commercial marketing principles to influence behaviours in target audiences that benefit society (Kotler & Lee, 2008, p. 7). Although social marketing has generally focused on health behaviours, its success suggests that it holds a powerful potential to influence environmentally sustainable behaviours in youth.

Effective social marketing draws upon a variety of behavioural, persuasion, communication, social learning, and social influence theories. As a result, the formative research behind a social marketing campaign includes finding out more about the needs and wants of the target audience in order to develop an effective message (Maibach, 1993). Indeed, sending the “right message” can be critical to the success of a campaign. One strategy in message development is framing, which manipulates perceptions of the outcomes of behaviours in terms of its benefits (gains) or costs (losses) (Rothman & Salovey, 1997). With environmentally sustainable behaviours, these resulting gains and losses can impact either the self, in terms of
social approval or disapproval (social threat), or the physical environment, in terms of the tangible consequences to the natural world (physical threat). Despite the finding that messages are a significant contributor to successful campaigns, limited effort on the part of practitioners has been put into the creation and placement of messages (Randolph & Viswanath, 2004). Indeed, although the persuasive effects of message framing have been widely publicized in the field of social and cognitive psychology, there is a surprising dearth in the literature regarding the role of message framing as a strategy within the context of social marketing. Randolph and Viswanath (2004) have suggested that using message framing in combination with a specific target audience can substantially enhance campaign success.

This study aims to address the gap in the literature on the role of message framing in social marketing campaigns promoting environmentally sustainable behaviour in adolescents. Through an experimental design, various message frames are tested on adolescents for their persuasiveness in influencing a case behaviour that benefits the environment. Developing a greater understanding of the types of messages that the youth population respond to can enhance the discipline of social marketing and enrich social marketing campaigns for sustainable behaviour change.
2.0 BACKGROUND

2.1 Theories of Behaviour

Social psychologists have studied the roots of human behaviour over centuries, and for a long time, it was a generally accepted belief that behaviour was directly guided by knowledge and attitudes. Early models of environmental behaviour were similarly based on the linear progression of environmental knowledge to attitudes and then to behaviour (Kollmuss & Agyeman, 2002). By the 1960s, an increasing number of studies had been conducted by behavioural researchers to better understand the relationship between attitudes and behaviours and to more accurately predict human actions (Ajzen & Fishbein, 2005, p. 174). However, studies found that attitudes were generally poor predictors of behaviour; indeed, the current knowledge-action gap in environmental behaviours is a reflection of this finding (Ajzen & Fishbein, 2005, p. 175). Consequently, it has been concluded that the overreliance of information-intensive campaigns based on simplistic assumptions about the relationship between attitudes and behaviours by both governments and environmental organizations is misguided (Kollmus & Agyeman, 2002).

Many theoretical frameworks have since been developed to explain the discrepancy between knowledge and action, including the theory of reasoned action, the theory of planned behaviour, the transtheoretical or stages of change model, social exchange theory, and the value-belief-norm theory (Chan, 1998; Kollmus & Agyeman, 2002; Kotler & Lee, 2008, p. 120). Although these theories are by no means exhaustive in explaining all human behaviours, they have been widely cited and supported as fundamental concepts in behavioural research and provide the theoretical foundation for this study.
2.1.1 Theory of Reasoned Action and Theory of Planned Behaviour

Ajzen and Fishbein’s (1980) theory of reasoned action and its extension, the theory of planned behaviour, have been among the most influential attitude-behaviour models in social psychology. The theory of reasoned action suggests that attitudes do not drive behaviours directly; rather, attitudes influence behavioural intentions, which in turn shape our actions (Figure 1). Behaviours are therefore dependent upon evaluative beliefs about the consequences of the behaviour, normative beliefs concerning how others would view the behaviour, and one’s motivation to comply with others’ views (Ajzen & Fishbein, 1980; Kollmus & Agyeman, 2002). For example, an individual in a public space may choose to hold on to a glass bottle in order to recycle it appropriately after considering their beliefs surrounding the need to conserve natural resources and what friends or bystanders may think about recycling. Alternatively, if the individual does not believe that recycling one glass bottle will make much of a difference and that this belief is shared by others, the decision may be made to throw it away in the nearest available garbage bin.

The theory of planned behaviour extends the theory of reasoned action by including the need for a belief by the individual actor that the intended behaviour is within the actor’s control and ability (perceived behavioural control) (Kotler & Lee, 2008, p. 170). In the case of whether to recycle, this theory maintains that the individual’s perception of whether a proper recycling receptacle exists and whether it is within reasonable proximity, for example, may affect their behavioural intention and the ultimate outcome of the situation. Both the theory of reasoned action and the theory of planned behaviour are predicated on the notion that intention to perform a behaviour, which is a function of attitudes and norms, is the most accurate prediction of actual behaviour (Chan, 1998). Applied to environmental action, these theories suggest that a positive
attitude, feelings of competence, and a belief that the new behaviour is socially acceptable are factors likely to motivate behavioural change (Nisbet & Gick, 2008).

2.1.2 The Transtheoretical Model

The transtheoretical or stages of change model of behaviour change suggests that individuals go through different stages of consciousness when deciding to adopt a given behaviour (Pelletier, Lavergne, & Sharp, 2008). Prochaska, DiClemente, & Norcross (1992) have broken this process down into five stages: precontemplation, contemplation, preparation, action, and maintenance. Each of these stages can be distinguished based on the individual’s current level of intent and their conscious attitudes toward the behaviour (Kotler & Lee, 2008, p. 121; Pelletier et al., 2008). As people gain more information and skills, they pass through the
stages in a linear fashion, but may progress at different rates or even relapse into an earlier stage (Nisbet & Gick, 2008).

The most effective intervention for change depends on the behavioural stage of the target audience. By identifying those who do and do not want to change, programs can be better designed to take into consideration individual differences and adopt appropriate strategies to facilitate change. Initially developed for smoking cessation, very few attempts have been made to apply the transtheoretical model to environmental behaviours (Nisbet & Gick, 2008). This study draws from the transtheoretical model by segmenting the study participants based on their level of engagement in environmental behaviours and in personal vehicle use, which is the case behaviour examined in the study.

2.1.3 Exchange Theory

Exchange theory postulates that people act out of self-interest and employ cost-benefit analyses in social transactions (Grier & Bryant, 2005; Homans, 1958). In economics, when the target market perceives that the benefits are equal to or are greater than the costs in a transaction, an exchange occurs. Similarly, in terms of voluntary human behaviour, exchange theory proposes that whether an individual adopts a behaviour is contingent on the benefits and costs of performing the behaviour. Therefore, behavioural change programs ought to reduce the cost and increase the benefits of the target behaviour they are trying to modify (Smith, 2006). In the case of environmentally sustainable behaviours, rewards may include resource conservation, social approval, and monetary savings, whereas costs may include environmental degradation, social disapproval, and monetary disincentives (DeYoung, 1993). The exchange framework is based on the principles of reward and punishment in operant conditioning, which states that people tend to
seek rewards and avoid punishment (Skinner, 1953). In this study, the benefits and costs of adopting the promoted behaviour is manipulated through the use of message framing.

2.1.4 Value-Belief-Norm Theory

The value-belief-norm (VBN) theory was developed to explain environmental behaviour by linking value theory, norm-activation theory, and the New Ecological Paradigm (Stern, Dietz, Abel, Guagnano, & Kalof, 1999). Environmental concern is a function of one’s egoistic orientation (concern for self), social orientation (concern for others), and biosphere orientation (concern for the environment). According to the VBN theory, the egoistic orientation most strongly influences an individual’s predisposition to environmental behaviour (Kollmus & Agyeman, 2002). In other words, environmentally sustainable behaviours are most motivated by individuals’ needs and wants, rather than by a strong concern for the well-being of the environment. This interesting finding is explored in this study through the testing of social and physical threats in messages and comparing whether framing behavioural outcomes in terms of its impact on the social self is more effective than framing outcomes in terms of its impact on the environment.

2.2 Defining Environmentally Sustainable Behaviour

The term “environmentally sustainable behaviour” in this study refers to actions that benefit the environment. Although these actions may occur at either the individual or societal level, this study focuses on individual behaviours, such as recycling and conserving resources, purchasing and using energy-efficient products, and taking alternative forms of transportation. In the literature, other terms for environmentally sustainable behaviour include “conservation
behaviour” (Monroe, 2003), “pro-environmental behaviour” (Kollmus & Agyeman, 2002), “environmentally significant behaviour” (Stern, 2000), “environmentally supportive behaviour” (Kennedy et al., 2009), and “ecological behaviour” (Kaiser, Wolfing, & Fuhrer, 1999).

Using an intent-oriented definition, Stern (2000) has conceptualized environmentally significant behaviour as “behaviour that is undertaken with the intention to change (normally, to benefit) the environment” (p. 408). He has specified distinct types of environmentally significant behaviour, which include environmental activism, nonactivist behaviours in the public sphere, and private-sphere environmentalism. Of particular interest in this study is private-sphere environmentalism, which refers to “the purchase, use and disposal of personal and household products that have environmental impact” (Stern, 2000, p. 409).

2.2.1 Determinants of Environmentally Sustainable Behaviour

As with human behaviour in general, environmentally sustainable behaviour is a function of interacting variables. These factors include pro-environmental attitudes, peer pressure, public visibility, responsibility, and tangible and social outcome desires (Axelrod & Lehman, 1993; Kaiser & Shimoda, 1999; Kaiser et al., 1999; Monroe, 2003). Dietz, Stern, & Guagnano (1998) have found that political liberalism, postmaterialistic values, and religious socialization are good predictors of environmental concern. In addition, social norms and altruism influence environmental behaviours, as modelled by Schwartz’ (1973) norm-activation theory, which holds that people will perform altruistic behaviours, such as pro-environmental behaviours, when they are aware of the negative consequences of adverse conditions and ascribe responsibility of those consequences to the self. A recent meta-analysis of psychosocial determinants of environmental
behaviour found that attitudes, behavioural control, and personal moral norms predict behavioural intention (Bamberg & Moser, 2007).

2.2.2 Barriers to Behavioural Change

Despite the strongest intentions, certain internal and external factors can override environmental behaviour. According to Blake (1999), attitude and temperament, lack of responsibility, and practicality represent three major barriers to action. Other factors that may hinder environmentally sustainable behaviour include a lack of knowledge, low environmental or altruistic consciousness, lack of emotional involvement, external locus of control, and inadequate social, economic, and/or institutional infrastructure (Kollmus & Agyeman, 2002).

Generally, the aforementioned determinants of and barriers to environmental behaviour also apply to adolescents; for example, Meinhold and Markus (2005) identified pro-environmental attitudes, knowledge, and self-efficacy as significant moderators of environmental behaviours in adolescents. Unlike adults, however, adolescents face several different barriers to environmental actions, such as limited resources and opportunities. In a study of Australian youth, lack of time, a sense of helplessness from the belief that their actions would not make a difference, and a lack of understanding of what is harmful were the most frequently cited barriers to environmental action in young people (Thielking & Moore, 2001). Studies on risky behaviours have also found that peer influences, social approval, and self-esteem are influential factors in adolescents, particularly for females (Abernathy, Massad, & Romano-Dwyer, 1995; Bird & Tapp, 2008; Kobus, 2003).
2.3 Social Marketing

The emerging field of social marketing has provided some new insights on influencing behavioural change. Social marketing involves the application of commercial marketing principles to influence voluntary behaviours that benefit society (Kotler & Zaltman, 1971; Tan et al., 2010). Changing behaviour is not necessarily the only aim of social marketing; a campaign may also encourage the adoption, rejection, maintenance, or abandonment of certain behaviours (Grier & Bryant, 2005). Social marketing’s focus on influencing behaviours, rather than simply raising awareness, links it to areas of social psychology and the application of behavioural theories, which sets it apart from the fields of communications and cause promotions (Kotler & Lee, 2008, p. 15).

Given that social marketing is derived from commercial marketing, strategies often include a combination of traditional marketing principles and tools, such as market research and segmentation, customer orientation, exchange theory, and the marketing mix, to sell a behaviour (Kotler & Lee, 2008, p. 14). Pre-eminent social marketing practitioners use differing models and take various approaches to influencing social change. Kotler and Lee’s ten-step approach draws heavily on conventional commercial marketing models, whereas Andreasen and McKenzie-Mohr take behaviour-specific approaches (Kotler & Lee, 2008, p. 14). Andreasen (1994) advocates programs that are customized to the behaviour and the target audience being influenced while McKenzie-Mohr’s (2000) community-based social marketing focuses on identifying the barriers to the behaviour and prescribing a strategy to overcome them.
2.3.1 Market Segmentation

A core strategy of social marketing involves the segmentation of the larger population into target audiences based on needs, wants, values, and lifestyles. Market segmentation allows campaigns to be designed to speak more effectively to the target audience (Maibach, 1993). In commercial marketing, audiences are traditionally divided based on demographic and geographic variables, such as ethnicity, age, or location. Since social marketing campaigns deal with behaviours, it is often more beneficial to segment the audience based on current behaviour, future intentions, readiness to change, or psychographic variables, such as cognitions, attitudes, personalities, and lifestyles (Grier & Bryant, 2005; Maibach, 1993). Effective social marketing campaigns typically use a combination of these variables to segment the target audience (Maibach, 1993). This study concentrates on the adolescent population and compares segments of the target audience based on behavioural and cognitive variables.

2.3.2 Marketing Mix

The marketing mix, also known as the Four Ps, is a fundamental element of commercial marketing and Kotler and Lee’s (2008) social marketing approach, and refers to four major tools used to influence target markets: product, price, place, and promotion (p. 10). In social marketing, the product refers to the target behaviour as well as the benefits and incentives of the campaign’s proposition, an example of which might be the encouragement of recycling (Peattie & Peattie, 2009). Price refers to the costs or disincentives associated with involvement, such as the extra time and effort it may take to recycle. Place refers to the distribution channel or system that facilitates the desired behaviour, such as the accessibility to recycling bins. Finally, promotion includes the persuasive communication strategies, key messages, messengers, and
communication channels designed to motivate the target audience to perform the desired behaviour (Kotler & Lee, 2008).

Promotion is merely one aspect of social marketing; however, it provides the voice and branding of the social marketing campaign, which ultimately pervades every aspect of the campaign and shapes how the message is perceived by the target audience (Wood, 2008). Indeed, promotional activities, such as advertising, signage, and displays are often the most visible component (Grier & Bryant, 2005). Sometimes, the message strategy can become the deal breaker of a particular social marketing campaign (Kotler & Lee, 2008, p. 274). Examining and evaluating effective promotional strategies to influence behaviour can therefore enhance the field of social marketing.

Social marketing is practiced not only by marketers, but also by governments, social service agencies, community and international organizations, and professionals (Kotler & Lee, 2008, p. 15). Thus far, social marketing has provided promising results, particularly in the realm of health-related behaviours, which has been the focus of the majority of campaigns (Peattie & Peattie, 2009). Some of the most successful social marketing campaigns targeted towards youth include Florida’s anti-smoking campaign (Truth), the Centre for Disease Control and Prevention’s campaign to promote physical activity (VERB), and the National Youth Anti-Drug Media Campaign in the United States (David, 2004; Grier & Bryant, 2005; Smith, 2006). While health-related behaviours have been the predominant focus of social marketing, the process can be and has been used to target a wide variety of social and/or environmental behaviours, such as encouraging youth to vote or dissuading the public from littering (Kotler & Lee, 2008, p. 9).
2.4 Message Framing

A technique used in social marketing to shape perceptions and construct meaning is message framing, which presupposes that the way an audience responds to a particular message can depend on how the message is tailored and subsequently encoded by the recipient (Davis, 1995; Pelletier & Sharp, 2008). Tversky and Kahneman (1981) first illustrated the framing effect in the prospect theory of psychology, which describes how people make decisions between alternatives that involve risk. These decisions can be framed as either perceived gains (gain frame) or perceived losses (loss frame) in relation to a particular reference point. For example, the adoption of recycling behaviour can be promoted through a gain frame, such as “if you recycle, you conserve natural resources”, or a loss frame, such as “if you do not recycle, the environment will deteriorate”. Both messages advocate the behaviour of recycling; however, one emphasizes the benefits of adopting the behaviour while the other focuses on the costs of not adopting the behaviour.

According to Tversky and Kahneman’s landmark study (1981), people tend to be more accepting of risks when a decision is framed in terms of its associated costs, whereas people tend to be more risk-averse when the same decision is framed in terms of its associated benefits. For example, when deciding on a hypothetical treatment program framed in terms of losses, participants were more likely to prefer a program where 66% of all 600 patients will die over one in which there is a 100% chance that 400 patients die. However, when deciding between programs framed in terms of gains, participants were more likely to choose one in which there is a 100% chance that 200 patients are saved over one in which there is a 33% chance that all 600 patients are saved. Thus, in the loss frame condition, participants tended to make the riskier
choice whereas they tended to avoid risks in the gain frame condition (Tversky & Kahneman, 1981).

Framing has since garnered strong interest among scholars in the domain of health persuasion. For example, Meyerowitz and Chaiken (1987) and Banks et al. (1995) have demonstrated that loss-framed messages more effectively persuaded women to take breast self-examinations than gain-framed messages. Conversely, Rothman, Salovey, Carol, Kelli, & Drake (1993) reported that women exposed to a gain-framed message were more likely to request sunscreen than those in loss-framed conditions. To explain the discrepancy, Rothman and Salovey (1997) have suggested that loss-framed messages are more effective for persuading detection behaviours (e.g. taking a breast examination), which may be perceived as risky, and gain-framed messages may be more effective for preventative behaviours (e.g. wearing sunscreen), which are perceived as more cautious.

More recently, the technique of message framing has been explored in the realm of environmental communications. Obermiller (1995) found that loss frames were more effective for the low salience issue of energy conservation, whereas gain frames were more effective for the high salience issue of recycling. According to Loroz (2006), the impact of framing in environmental communications is contingent on whether the message is self-referencing, where the message describes how the behaviour affects the recipient, or self-other referencing, where the message describes how the behaviour affects the recipient as well as others, such as one’s children or community. Loss frames appear to be more persuasive in promoting recycling behaviour when the message is self-referencing, while gain frames are more persuasive when the message is self-other referencing (Loroz, 2006).
Not all individuals are equally susceptible to framing effects. The level of experience and knowledge of each individual affects his or her response to a framed message (Kaczynski, Havitz, & McCarville, 2005). Message involvement and the level of information processing can also interact with framed messages to influence attitudes and behaviours (Block & Heller, 1995; Loroz, 2006; Meijnders, Midden, & Wilke, 2001). Selecting the most effective message frame depends on the target audience’s stage of behaviour change, which is consistent with the transtheoretical model (Pelletier & Sharp, 2008). Overall, however, loss-framed messages do seem to be more persuasive than gain-framed messages and tend to foster intentions to adopt the target behaviour, which may be explained by the tendency to perceive negative information as more important, salient, and fear inducing (Davis, 1995).

In general, message framing in environmental communications for youth has been insufficiently explored in the literature (Kolandai-Matchett, 2009). This study addresses this gap by examining the impact of gain-framed and loss-framed messages targeted to adolescents promoting environmentally sustainable behaviour.

2.5 Type of Threat

In any type of communication, a message can be framed to elicit a desired response from the target audience and the content of messages can be designed to target the recipient of the gains and/or losses in different ways. In environmental communications, the message is often designed to target the recipient by highlighting the relationship between the advocated behaviour and the physical environment, or by highlighting the physical threat associated with the behaviour. While the term “threat” typically carries negative connotations, this study defines “physical threat” not necessarily as unfavourable consequences, but simply as any result that
emphasizes the physical environment as the primary beneficiary of the behaviour. In contrast, the benefits and/or costs of behaviour that are associated with the self in relation to others are referred to as “social threats”.

The concept of social and physical threats is derived from similar threat types used in fear appeals. Fear appeals, a strategy commonly used in social marketing, have been studied for decades and have been supported by research that demonstrate the effectiveness of fear arousal in influencing behavioural change (Donovan & Henley, 1997). Most of the existing research on social and physical threats relates to health behaviours. For example, Schoenbachler and Whittler (1996) have demonstrated that social threats, which rely on social disapproval messages, are more persuasive than physical threats in anti-drug use communications for adolescents. Wiley, Krisjanous, & Hutchings (2002) have found that the youth population tends to relate more favourably to social fear appeals than to physical fear appeals.

Furthermore, studies on emotional arousal, such as fear, have demonstrated its significant role in determining behaviour. Emotional arousal in response to a cue leads to avoidance of behaviours that may have aversive consequences (Dienstbier, Hillman, Leinhoff, Hillman, & Valkenaar, 1975; Weiner, 1980). In other words, the fear of punishment or disapproval results in the avoidance of behaviours that would lead to either consequence. Coke, Batson & McDavis (1978) have suggested that both cognition and emotional arousal interact to influence behaviour. Baumeister, Vohs, DeWall & Zhang (2007) have added that emotion indirectly causes behaviour by acting as a feedback system that facilitates the learning of associations between affect and behavioural responses.
There has not been substantial research on the use of fear appeals in the promotion of sustainable behaviour. Part of the issue with using fear appeals for sustainable behaviour is the temporal distance of the negative consequences of unsustainable behaviour, which are not often felt by the individual who performs the behaviour, but by future generations to come (De Vries, Ruiter & Leegwater, 2002). However, it is proposed that research supporting the use of social threat in influencing health behaviours can be applied to promoting environmentally sustainable behaviours. Indeed, according to Bird and Tapp (2008), adolescents are particularly susceptible to social pressures because they fear social disapproval; hence, they strive to appear “cool” among their peers. Social threats, then, in the context of a loss-framed message may be effective in influencing sustainable behaviours, particularly in the adolescent population. Therefore, in addition to gain and loss message frames, this study looks at the interaction of social and physical threats in framed messages targeted to adolescents promoting environmentally sustainable behaviour.
3.0 STUDY

3.1 Participants

Youths between the ages of 14 and 18 from suburban, middle-class municipalities in Southern Ontario were the population of interest in this study. A total of 255 youth participants were recruited from community centres and shopping malls in two municipalities – Markham and Kitchener-Waterloo – to participate in the study (see Appendix A). Five participants were omitted from further analysis for not meeting the age criterion for the study or for not completing the central measures, leaving a sample of 250. More participants (68%) were recruited from Markham than from Kitchener-Waterloo (32%).

Youth was defined as between the ages of 14 and 18 because this is the typical age range of students in secondary school. The average participant was 16 years old. The recruited sample skewed towards the younger end of the age range with 54% of the participants aged 14-15 and 39% aged 16-17; only 7% of the participants were 18 years old (see Figure 2).

![Figure 2. Age distribution of study sample](image)
More females participated in the study than males (see Figure 3). In appreciation for their time, participants received a $2 gift card incentive for participating in the study.

3.2 Design and Procedure

The study employed a 2 x 2 between-subjects factorial design comparing message frame (gain vs. loss) with type of threat (social vs. physical). Participants were thus randomly assigned to one of four treatment conditions: physical loss, physical gain, social loss, and social gain. Participants were invited to complete a questionnaire about driving behaviours and their responses to a social marketing product on driving. Participants were then asked to view one of the four print advertisements and complete a four-page, 27-item questionnaire measuring their responses to the ad, self and peer driving attitudes and behaviours, future driving intentions, and environmental attitudes and behaviours (see Appendix B).

Overall, participants were equally distributed across the conditions, with 63 participants each in the physical gain and physical loss conditions, 64 participants in the social loss condition,
and 60 in the social gain condition. There were significantly more female participants in the physical loss (75%) and physical gain (70%) conditions than there were males. The gender distribution in the social loss and social gain conditions was roughly equal. The distribution by age was proportional in both gain conditions; however, in the physical loss condition, most of the participants were 14 and 15 (63%), and in the social loss condition, a considerable percentage of participants were 16 years old (34%).

3.3 Case Behaviour: Reducing Personal Vehicle Use

Reducing personal vehicle use was selected as the target behaviour in this study for several reasons. The harmful effects of driving on both the environment and human health are well known. Over the past few decades, the developed world’s obsession with motor vehicles has led to global oil shortages, urban congestion, air pollution and smog, and increased road rage (Wall, 2005). Within the transport sector, personal vehicle use is the second largest contributor of greenhouse gas emissions (Chapman, 2007). A recent NASA study suggested that reducing emissions from on-road transportation could lead to rapid and long-term benefits for both the climate and for human health (Unger et al., 2010).

Social marketing campaigns designed to promote sustainable behaviours have generally focused on the adoption of behaviours, such as recycling, installing compact-fluorescent bulbs, and using reusable bags instead of plastic bags (Haldeman & Turner, 2009; Jesson, 2009; Lehman & Geller, 2004; McKenzie-Mohr, 2000). In contrast, there have been few campaigns to demarket, or discourage, consumer behaviours that adversely impact the environment. Meanwhile, efforts to demarket status symbol products involved in health-related behaviours, such as cigarettes and alcohol, has demonstrated substantial success among teens (Evans et al.,
As with cigarettes, cars carry the “allure of the illicit and risky” (Bird & Tapp, 2008). In many ways, people are addicted to driving just as they are addicted to smoking (Nisbet & Gick, 2008). It is hypothesized that a status symbol product that harms the environment – personal vehicles, in this case – can also be successfully demarketed through social marketing.

Granted, there are significant barriers to changing driving behaviour. Beyond the convenience and mobility of personal vehicles, cars have also been shown to confer many psychosocial benefits, including self-esteem, autonomy, protection, prestige, and mastery (Ellaway, Macintyre, Hiscock, & Kearns, 2003). Motivations to drive are varied, which may explain why attempts to reduce driving have been met with resistance (Steg, 2005). Even among teens, car ownership is perceived as a powerful status symbol, and young people in particular are influenced by the approval of their peers (Schoenbachler & Whittler, 1996). Nonetheless, adolescents – especially those who are not of driving age – are less committed to the car-based lifestyle of their parents and may be more susceptible to arguments against frequent personal vehicle use (Wright & Egan, 2000).

3.4 Stimulus Materials

Four stimulus print advertisements were created for the study, each depicting one of the four frames: physical gain, physical loss, social gain, and social loss (see Appendix C). The four stimulus ads followed a similar format in their design; each featured an image and text depicting the framed message, a driving-related fact, a slogan for the campaign (“It’s Not That Far. Ditch the Car.”), and a list of alternatives to driving.
The physical loss ad featured a vehicle driving from a pristine, beautiful landscape into a dark, polluted city. Above the juxtaposed images was the text: “Where our driving is really taking us”. The driving fact on the ad stated, “The average car emits 4 tonnes of pollutants annually, causing almost 2,000 premature deaths in Ontario alone.”

In the physical gain ad, the text of driving alternatives (bus, bike, carpool, etc.) forms the shape of a spray-paint bottle, which paints a beautiful scenery on a brick wall under the tagline, “The world is our canvas, so let’s paint something beautiful”. The text in the ad stated, “Each year, Canadians makes 2,000 car trips for distances less than 3 km. Many of these trips could easily be done on foot, by transit or on a bicycle.”

In the social loss ad, silhouette images of youths on bicycles, skateboards, and unicycles were intermixed with silhouette images of youths dancing to create a party scene. One of the silhouette people cannot reach the party because he cannot tow the car attached to him. The text stated, “Myth: Cars give you freedom. Fact: You give your freedom to cars. We always see ads with cars on empty roads, but never in the middle of a traffic jam. Someone needs a reality check.”

Finally, the social gain ad used the same silhouette images as in the social loss ad to create a party scene, but without the image of the person towing the car. The social gain ad also used brighter, warmer background colours than the social loss ad. The driving fact read, “The average Canadian spends over 275 hours driving to and from work each year. This is how we roll.”
3.5 Measures

Items on the questionnaire were measured on 5-point Likert scales, anchored by “1 - strongly disagree” and “5 - strongly agree”, unless otherwise stated. For items that were summed or averaged to create a single variable, Cronbach’s alpha (\( \alpha \)) was used to check that the internal consistency of the items met a minimum reliability of 0.70 before they were combined.

3.5.1 Manipulation Check

Questionnaire items used to test the effectiveness of the framing treatment on the cognitive dimension were adapted from Cho & Boster (2008). The effectiveness of the gain treatment was measured using the following items: “This ad focused on the advantages of not driving” and “This ad showed the positive things that can happen if one drives less”. Measures of the loss frame included “This ad focused on the disadvantages of driving” and “This ad showed the negative things that can happen if one drives”. Similarly, physical threat was measured with the items, “This ad focused on the physical effects of not driving” and “This ad stressed the results of driving on the environment”. Social threat was gauged with the following statements: “This ad focused on the social effects of not driving” and “This ad stressed the results of driving on what others think of me”.

3.5.2 Confound Variables

To ensure that responses to the ad conditions were not influenced by the extent to which participants understood the ad, control questions were included in the survey. Four items were used to measure whether the ad was perceived as realistic, relatable, informative, and understandable (\( \alpha = 0.734 \)) and responses were averaged to create an index for control. The
items were adapted from Cho & Boster (2008), who noted that these factors must be taken into consideration when examining the effects of public service ads.

3.5.3 Driving Norm

Several measures gauged the driving norm in the participants’ social context – that is, the extent to which participants were embedded in a car-based culture. Participants were asked whether their friends hold driver’s licenses and for the frequency of their friends’ driving behaviours. In addition, participants provided responses for the number of vehicles in their household, the frequency of their parents’ driving, and the frequency at which the participant rides in a vehicle as a passenger. On the driving frequency questions, participants were given the response options of “never”, “1-2 times a week”, “3-4 times a week”, “5-7 times a week”, and “over 7 times a week”. Driving frequencies were then grouped into three categories: non-drivers (0 times a week), low frequency drivers (1-4 times a week), and high frequency drivers (over 5 times a week).

3.5.4 Driving Behaviours

Information about past driving behaviours was collected. Participants were asked whether they held a driver’s license, the level of the driver’s license, and whether they had ever driven before. For those who were drivers, the frequency of their driving behaviour and their usual driving destinations were also collected. The measure for driving destinations included an open-ended response option for participants to report destinations not listed on the questionnaire. In addition, participants were asked to rank the following factors by the extent to which they are considered when deciding between driving and alternative transportation methods: time, cost,
convenience, distance, availability/accessibility of alternatives, and popularity. This question also included an open-ended option to report other factors taken into consideration that were not already listed.

3.5.5 Environmental Behaviours

Environmental behaviours were gauged with six items that assessed the frequency at which participants engaged in the following behaviours: (1) turn off electrical equipment when not in use; (2) walk or ride a bike for short distances; (3) reuse shopping bags; (4) recycle; (5) buy certified organic foods; and (6) point out unsustainable behaviours to others. These items were adapted from Kaiser, Oerke, & Boger (2007). Response options ranged from “1 – never” to “5 – always”. Item responses were summed (α = 0.628) to create a score between 6 and 30. Participants were categorized based on their score as low (6-20), medium, (21-25), or high (26-30) engagers in environmental behaviours.

3.5.6 Dependent Variables

AD APPEAL. Four items were used to measure participants’ immediate attitudes toward the advertisement and the extent to which they believed the ad would be appealing to their peers. The items included “I like the ad a lot”, “This is an ad I would remember”, “This ad would be appealing to people like me”, and “After viewing the ad, I would consider driving less often”. These items were averaged to create an index for ad appeal (α = 0.847).

AFFECTIVE AROUSAL. To assess the affective arousal in participants following the viewing of the ad, participants rated the extent to which they experienced various emotions from “1 - not at all” to “5 - very much”. Measures for affective arousal were adapted from Cho & Boster
(2008) and included five emotions: joy (happy and joyful, α = 0.905), contentment (contented and peaceful, α = 0.712), anger (angry and annoyed, α = 0.832), fear, and sadness. An open-ended question (“How did this ad make you feel?”) was also asked to gauge overall affective arousal and attitudinal responses towards the ad.

**PERCEIVED BENEFICIAL IMPORTANCE.** Measures of persuasion were adapted from Loroz (2007). On two items, participants were asked to rate how beneficial and how important they perceived driving to be after viewing the ad, from “1 – not at all beneficial/important” to “5 – extremely beneficial/important”. The two items were averaged to create a measure for perceived beneficial importance (α = 0.792).

**INTENTIONS.** Six items measured the future driving intentions of participants. Three items determined the frequency of intended driving behaviour: “I intend to drive at least once in the future”, “I intend to drive occasionally in the future”, and “I intend to drive regularly in the future”. Three items compared the participant’s intended driving behaviour to his/her current driving behaviour. These items included, “I intend to drive more often in the future than I do now”, “I intend to drive less often in the future than I do now”, and “I intend to drive at about the same frequency that I do now”.

**DRIVING ATTITUDES.** Twelve items were used to measure driving attitudes of participants and the driving attitudes of their friends. Participants rated the extent to which they and their friends would agree with the statement, “I think driving is…” followed by the attitudes: good, necessary, convenient, independent, cool, boring, normal, inefficient, bad, fun, relaxing, and thrilling. These items were adapted from research by Steg (2005) on the instrumental, social, and affective motives of car use. The question also included an open-ended option for participants to identify other attitudes they felt towards driving that were not already provided.
ENVIRONMENTAL ATTITUDES. Four items were used to assess environmental attitudes. Participants were asked the extent to which they agreed with the following statements: “Protecting the environment is important to me”, “Personal vehicle use is an unsustainable behaviour”, “I feel uninformed about environmental issues”, and “Reducing personal vehicle use will not benefit the environment”.

3.5.7 Motivations for Change in Driving Behaviour

Using an open-ended question, participants were given an opportunity to provide their insight on barriers to and motivators for the case behaviour change of reducing personal vehicle use. As a final unrestricted question, all participants were asked, “What would it take to get you to reduce or minimize your current driving habits? To choose alternatives?”
4.0 RESULTS

Analyses of variance (ANOVA), which make inferences about means based on variance, were primarily used for the quantitative analysis of survey data after checking for approximation of normality. A significance value of $p < .05$ was adopted. In recognition of the controversy among scholars regarding the use of parametric tests on ordinal Likert data, more conservative non-parametric tests were also used in analysis (Carifio & Perla, 2007; Jamieson, 2004; Michel, 2000; Norman, 2010). Kruskal-Wallis tests, completed by Dr. S. D. Murphy, yielded similar results and confirmed $p < .05$ in all cases.

4.1 Manipulation Check

For the two survey items designed to check for perceptions of gain, participants in the gain-framed treatments scored slightly higher ($M = 3.46, SD = 1.22$ and $M = 3.54, SD = 1.13$) than those in the loss-framed treatments ($M = 3.31, SD = 1.39$ and $M = 3.35, SD = 1.15$). Likewise, for the two items designed to check for perceptions of loss, those who were in the loss-framed conditions scored higher ($M = 3.53, SD = 1.30$ and $M = 3.42, SD = 1.31$) than those who were in the gain-frame conditions ($M = 2.93, SD = 1.26$ and $M = 2.32, SD = 1.14$). One-way ANOVAs indicated that for both items, these perceptions of loss were significantly higher for those in the loss-frame than those in the gain-frame conditions ($F(1, 248) = 13.77, p < .001$ and $F(1, 245) = 49.02, p < .001$).

While two survey items each were designed to check for perceptions of social and physical messaging, one-way ANOVAs showed significant results for one item each. Youth in the social threat conditions had significantly higher perceptions of social messaging ($M = 3.08, SD = 1.06$) than those who were in the physical threat conditions ($M = 2.59, SD = 1.08, F(1,244)$...
= 11.71, \( p = .001 \)). Similarly, participants in the physical threat conditions scored significantly higher on perceptions of physical effect messaging (\( M = 3.90, SD = 1.17 \)) than those who were in the social threat conditions (\( M = 2.73, SD = 1.27, F(1, 245) = 57.49, p < .001 \)).

### 4.2 Confound Check

Participants across all conditions perceived the ads to be realistic, relatable, informative, and understandable (overall \( M = 3.80, SD = 0.83 \)). The physical loss (\( M = 3.87, SD = 0.78 \)), physical gain (\( M = 3.88, SD = 0.82 \)), and social gain (\( M = 3.85, SD = 0.86 \)) conditions scored highest on the control variables, whereas the average responses in the social loss condition were slightly lower (\( M = 3.61, SD = 0.84 \)). However, one-way ANOVA found no significant differences among means (all \( p > .05 \)).

### 4.3 Driving Norm

Among the participants, there was a wide distribution in the number of friends who hold drivers’ licenses (see Figure 4).

*Figure 4. Response frequency of proportion of friends who hold drivers’ licenses*
With regards to their friends’ driving frequency, 22% of participants’ friends were perceived as non-drivers, 52% were perceived as low frequency drivers, and 27% were perceived as high frequency drivers. Driving norms were stronger within the family. Nearly all of the participants (92%) reported that their parents were high frequency drivers. Likewise, most participants (76%) considered themselves to be high frequency passengers, while 23% reported riding in a vehicle at low frequency. Most participants (53%) reported having two vehicles in the household ($M = 2.12, SD = 1.01$, see Figure 5).

![Figure 5. Response frequency of number of vehicles in household](image)

### 4.4 Driving Behaviours

The majority of participants in this study (66%) reported not having a valid driver’s licence whereas 34% reported having a valid licence. Figure 6 shows the distribution of licence types for the licensed drivers.
With regards to driving frequency, the majority of respondents (55%) reported that they have driven before, although 64% said that they never drive. In fact, only 9% of respondents considered themselves to be high frequency drivers. When asked about typical driving destinations, the most popular endpoints were school, friends’ houses, and out with friends while the least popular destinations were work and shopping (see Figure 7).
Participants were also given the opportunity to report locations not listed on the questionnaire; of these responses, sports-related destinations were most cited (e.g., practice, games). When deciding between driving and alternative transportation methods, participants ranked time as the factor most considered, followed by distance, convenience, accessibility of alternatives, cost, and popularity.

4.5 Environmental Behaviours

Participants generally engaged frequently in environmentally sustainable behaviours based on the overall score from self-report items (\(M = 22.41, SD = 3.91\)). After segmentation, 30% of participants were categorized as low engagers, 45% as medium engagers, and 63% as high engagers of environmental behaviours. The behaviours engaged in most often were recycling (\(M = 4.47, SD = 0.84\)), turning off lights and electrically powered appliances when not in use (\(M = 4.19, SD = 1.03\)), reusing shopping bags (\(M = 4.18, SD = 1.09\)), and walking or riding a bike for short distances (\(M = 3.85, SD = 1.18\)). Participants were less likely to buy certified organic foods (\(M = 2.70, SD = 1.25\)) or to point out an unsustainable behaviour to another person (\(M = 3.00, SD = 1.22\)). One-way ANOVA analysis showed that females significantly reuse shopping bags more (\(M = 4.42, SD = 0.87\)) than males (\(M = 3.74, SD = 1.29\), \(F(1,245) = 24.34, p < .001\)).
4.6 Dependent Variables

4.6.1 Ad Appeal

One-way ANOVAs revealed no significant differences among conditions in the perceived appeal of the ads. Generally, appeal toward the ad was very positive ($M = 3.41$, $SD = 1.01$) and consistent across all experimental conditions: physical loss ($M = 3.52$, $SD = 0.93$), physical gain ($M = 3.36$, $SD = 1.08$), social loss ($M = 3.27$, $SD = 0.96$), and social gain ($M = 3.48$, $SD = 1.05$, all $F$-values $p > .05$).

4.6.2 Affective Arousal

Significant differences were found in affective arousal among the four conditions (see Table 1 and 2).

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Physical Gain</th>
<th>Social Gain</th>
<th>Physical Loss</th>
<th>Social Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joy</td>
<td>3.03 (0.94)</td>
<td>2.90 (1.00)</td>
<td>1.81 (0.94)</td>
<td>2.54 (0.94)</td>
</tr>
<tr>
<td>Contentment</td>
<td>3.01 (0.93)</td>
<td>3.03 (0.85)</td>
<td>1.86 (0.81)</td>
<td>2.79 (0.87)</td>
</tr>
<tr>
<td>Anger</td>
<td>1.89 (1.13)</td>
<td>1.97 (1.12)</td>
<td>2.66 (1.09)</td>
<td>2.13 (1.15)</td>
</tr>
<tr>
<td>Fear</td>
<td>2.02 (1.17)</td>
<td>1.70 (1.00)</td>
<td>2.98 (1.23)</td>
<td>1.73 (0.98)</td>
</tr>
<tr>
<td>Sadness</td>
<td>2.24 (1.38)</td>
<td>1.77 (1.11)</td>
<td>3.22 (1.43)</td>
<td>1.84 (1.07)</td>
</tr>
</tbody>
</table>

Note. Numbers in parentheses indicate standard deviation.

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Between Groups</th>
<th>Within Groups</th>
<th>MS</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joy</td>
<td>3</td>
<td>244</td>
<td>18.374</td>
<td>20.143</td>
<td>.000</td>
</tr>
<tr>
<td>Contentment</td>
<td>3</td>
<td>242</td>
<td>18.108</td>
<td>24.090</td>
<td>.000</td>
</tr>
<tr>
<td>Anger</td>
<td>3</td>
<td>243</td>
<td>7.273</td>
<td>5.785</td>
<td>.001</td>
</tr>
<tr>
<td>Fear</td>
<td>3</td>
<td>244</td>
<td>22.074</td>
<td>18.255</td>
<td>.000</td>
</tr>
<tr>
<td>Sadness</td>
<td>3</td>
<td>243</td>
<td>26.878</td>
<td>17.063</td>
<td>.000</td>
</tr>
</tbody>
</table>
A two-way ANOVA showed an interaction of frame and threat factors on feelings of joy ($F(1,244) = 12.54, p < .001$). Simple main effect analyses found that for those in the physical threat condition, gain framing led to higher scores on joy than loss framing ($F(1,244) = 50.59, p < .001$). Similarly, gain framing led to higher scores for those in the social threat condition ($F(1,244) = 4.42, p < .05$). Analysis also revealed main effects of both frame and threat on joy arousal. Gain framing led to higher levels of joy than loss framing ($F(1,244) = 42.46, p < .001$). Social threat led to higher levels of joy than physical threat ($F(1,244) = 6.03, p < .05$). There was also a main effect of gender: females in all conditions reported significantly lower levels of joy than males ($F(1,240) = 7.29, p < .01$). Measures of contentment followed the same pattern as joy arousal; ANOVA found both main effects of and interaction between frame and threat factors on level of contentment.

There was a main effect of frame on anger arousal, with participants in the loss frame conditions scoring higher on anger than those in the gain frame conditions ($F(1,243) = 10.74, p = .001$). Simple main effect analyses of the interaction between frame and threat factors revealed that within the loss treatment, participants exposed to physical threat reported more anger than those exposed to social threat ($F(1,243) = 5.61, p < .05$).

For measures of fear and sadness, there was a main effect of threat, with those in physical threat conditions scoring higher than those in social threat conditions (both $p < .001$). There was also a main effect of framing, with loss framing leading to higher levels of fear and sadness than gain framing (both $p < .001$).
Table 3

Summary of Responses to “How did this ad make you feel?”

<table>
<thead>
<tr>
<th>Responses</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physical loss</td>
</tr>
<tr>
<td>Affective responses</td>
<td></td>
</tr>
<tr>
<td>▪ Sad/Depressed</td>
<td>6</td>
</tr>
<tr>
<td>▪ Worried</td>
<td>3</td>
</tr>
<tr>
<td>▪ Bad/Guilty</td>
<td>2</td>
</tr>
<tr>
<td>▪ Shocked</td>
<td>2</td>
</tr>
<tr>
<td>▪ Nice/Happy/Good</td>
<td>2</td>
</tr>
<tr>
<td>▪ Inspired/Motivated</td>
<td>1</td>
</tr>
<tr>
<td>▪ Confused</td>
<td>1</td>
</tr>
<tr>
<td>▪ Surprised</td>
<td>1</td>
</tr>
<tr>
<td>▪ Selfish</td>
<td>-</td>
</tr>
<tr>
<td>▪ Intrigued/Amused</td>
<td>-</td>
</tr>
<tr>
<td>▪ Energetic/Excited</td>
<td>-</td>
</tr>
<tr>
<td>▪ Nothing</td>
<td>1</td>
</tr>
<tr>
<td>“That driving is bad for the environment/health”</td>
<td>25</td>
</tr>
<tr>
<td>“That I/Using alternatives can make a difference”</td>
<td>8</td>
</tr>
<tr>
<td>“That I/people should not drive/drive less”</td>
<td>2</td>
</tr>
<tr>
<td>“Makes me want to use alternative modes of</td>
<td>1</td>
</tr>
<tr>
<td>transportation”</td>
<td></td>
</tr>
<tr>
<td>“Makes me want to drive”</td>
<td>1</td>
</tr>
<tr>
<td>“Made me think”</td>
<td>2</td>
</tr>
<tr>
<td>“More aware”</td>
<td>5</td>
</tr>
</tbody>
</table>
Table 3 shows a summary of the responses to the open-ended question, “How did this ad make you feel?” This questioned garnered both affective and attitudinal responses to each of the four ads. Participants in the physical loss condition tended to report feeling sad or depressed and felt that driving is bad for the environment or health while participants in any of the other three conditions more often wanted to use alternative modes of transportation after viewing the ad. Appendix D includes a full summary of responses.

4.6.3 Perceived Beneficial Importance

Two-way ANOVA showed a significant interaction between frame and threat factors on the perception of driving as beneficial and important ($F(1,244) = 6.70, p = .01$, see Figure 8). Simple main effect analyses revealed a marginally significant difference between the gain frame conditions: Participants who were exposed to social threat perceived driving to be less beneficial and important than those exposed to the physical threat ($F(1,244) = 3.61, p = .059$). This pattern was reversed for the loss frame conditions: Participants who were exposed to social threat perceived driving to be more beneficial and important than those exposed to physical threat ($F(1,244) = 3.10, p = .08$). There was also a main effect of gender; females across all conditions perceived driving to be less beneficial and important than males ($F(1,240) = 12.92, p < .001$).
4.6.4 Intentions

A significant interaction was revealed between participants’ driving frequencies and frame treatment on responses to the item, “I intend to drive at least once in the future” ($F(2,235) = 6.09, p < .005$, see Figure 9). Simple main effect analyses found that for non-drivers, those in the loss conditions scored significantly lower on the intention than those in the gain conditions ($F(1,235) = 10.60, p = .001$). Conversely, for low frequency drivers, those in the loss conditions scored significantly higher on the same measure than those in the gain condition ($F(1,235) = 4.23, p < .05$).

Figure 8. Interaction of frame and threat on perceived beneficial importance of driving

Figure 9. Interaction of participants’ driving frequency and frame on intention to drive at least once in the future
Simple main effect analyses of the interaction between environmental behaviours and framing found that participants who reported low environmental behaviours scored significantly lower when in the loss frame treatment than when in the gain frame treatment on their intention to drive at least once in the future ($F(1,237) = 5.84, p < .05$, see Figure 10). Within the loss frame treatments, there were marginally significant differences in driving intentions among the different levels of environmental behaviour ($F(2,237) = 2.95, p = .054$): participants who reported low environmental behaviours scored lower on the driving intention than participants who reported high environmental behaviours.

On the measure, “I intend to drive more often in the future than I do now”, a significant interaction was also found between environmental behaviours and condition ($F(6,235) = 3.64, p < .005$). Within the physical gain condition, participants who reported high environmental behaviours scored significantly lower on the driving intention than those who reported low environmental behaviours ($F(2,223) = 6.32, p < .005$, see Figure 11).
A significant interaction between gender and condition was found on intentions to drive more frequently in the future ($F(3,230) = 3.26, p < .05$). Simple main effect analyses revealed that females in the social loss condition scored significantly lower in comparison to females in any other condition (all $p < .05$, see Figure 12). Within the social loss condition, females also scored significantly lower than males on the driving intention ($F(1,230) = 9.56, p < .005$).

![Figure 11](image1.png)

*Figure 11.* Intention to drive more frequently in the future by environmental behaviour category within the physical gain condition.

![Figure 12](image2.png)

*Figure 12.* Interaction of condition and gender on intention to drive more frequently in the future
4.6.5 Attitudes

There was a main effect of gender on most of the driving attitude measures (all $p < .05$). Males scored higher than females on the attitudes good, cool, fun, relaxing, and thrilling. This pattern was reversed for the attitude boring (see Figure 13).

![Figure 13. Main effect of gender on driving attitudes](image1)

![Figure 14. Mean responses to driving attitudes by driving frequency](image2)
A main effect of driving frequency was found on the perception of driving as good, necessary, cool, fun, thrilling, and relaxing (all $p < .05$). Non-drivers scored significantly lower on these measures than high frequency drivers (see Figure 14).

A significant interaction was found between environmental behaviours and condition on perception of driving as necessary ($F(6,232) = 2.388$, $p < .05$). Within the physical gain condition, participants who reported low environmental behaviours ($M = 4.55$) saw driving as more necessary than those who reported medium ($M = 3.64$) or high ($M = 3.50$) environmental behaviours.

There was also a marginal main effect of threat on perceptions of driving as fun ($F(1,244) = 3.587$, $p = .059$). Within the loss frame conditions, participants exposed to social threat ($M = 3.81$, $SD = 1.10$) scored significantly higher than those exposed to physical threat ($M = 3.35$, $SD = 1.23$, $F(1,244) = 4.63$, $p < .05$).

![Figure 15. Mean responses for own driving attitudes vs. perception of friends' driving attitudes](image-url)
A paired-samples t-test found significant differences in participants’ attitudes towards driving and their perception of their friends’ attitudes towards driving (all \( p < .05 \)). Participants across the conditions significantly rated their friends’ positive attitudes (good, necessary, independent, cool, normal, fun, relaxing, and thrilling) towards driving as higher than their own positive attitudes towards driving, while they rated their own negative attitudes towards driving (bad and boring) significantly higher than their friends’ negative attitudes (see Figure 15).

**4.6.6 Environmental Attitudes**

Generally, participants on average agreed that protecting the environment was important to them (\( M = 3.88, \ SD = 1.05 \)). However, participants felt somewhat uninformed about environmental issues (\( M = 3.04, \ SD = 1.18 \)). Participants also tended not to perceive personal vehicle use as an unsustainable behaviour (\( M = 2.97, \ SD = 1.06 \)). Nonetheless, they tended to disagree on the statement, “Reducing personal vehicle use will not benefit the environment” (\( M = 2.22, \ SD = 1.27 \)).

A main effect of gender was found on environmental attitudes (\( F(1,242) = 4.875, \ p < .05 \)). Specifically, females (\( M = 3.98, \ SD = 1.01 \)) scored higher on the item, “Protecting the environment is important to me,” than males (\( M = 3.70, \ SD = 1.11 \)).

Significant differences among conditions were revealed in responses to the item “Reducing personal vehicle use will not benefit the environment” (\( F(3,244) = 4.012, \ p < .01 \)). Participants in the physical loss condition scored significantly higher (\( M = 2.66, \ SD = 1.31 \)) than participants in the other conditions: physical gain (\( M = 2.19, \ SD = 1.34 \)), social loss (\( M = 2.09, \ SD = 1.22 \)) and social gain (\( M = 1.92, \ SD = 1.09 \)). How participants responded to this question also depended on their age. Younger participants tended to score lower than older participants.
\( F(4,239) = 2.751, \ p < .05 \). Fifteen-year-olds scored lowest on the measure \( (M = 1.98, \ SD = 1.13) \), whereas eighteen-year-olds scored highest \( (M = 3.00, \ SD = 1.12) \).

### 4.7 Motivations for Change in Driving Behaviours

When asked what it would take to reduce or minimize current driving habits or to choose alternatives, a wide range of responses was given. The majority of motivators named by participants were related to improved public transit; the most popular response was having more convenient public transit options. In addition, improved infrastructure for alternatives to personal vehicle use and less expensive public transit were listed as incentives. These sentiments are neatly summarized in the following comment by a questionnaire respondent, “Make transit easier in the city, make bike routes, and safe ways to travel. Make bus routes more accessible.”

Other factors cited by respondents included good weather, reduced distances or easier access between common destinations, and an improved awareness of the consequences to driving. Motivators linked to environmental sustainability were cited by respondents only 11 times. Appendix D includes a full summary of responses.
5.0 DISCUSSION AND RECOMMENDATIONS

Given the need to foster an environmentally sustainable society and the gap in the literature on how to effectively influence sustainable behaviour change, this study sought to determine and evaluate the effects of message frame and threat in social marketing campaigns for the environment, with the goal of better understanding the types of messages that connect with the next generation – the youth population. Recognizing that behaviours are shaped by interacting variables, message frames and threats were assessed in an experimental design based on multiple criteria, including advertisement appeal, affective arousal, perceived beneficial importance, driving intentions, and attitudes toward driving and the environment.

The results of the study indicate that framing significantly alters perception of a message and subsequent behaviour in youth, which is consistent with prospect theory (Kahneman & Tversky, 1981). Similar to findings from framing research, loss-framed messages were found to be more effective than gain-framed messages in reducing driving behaviour among adolescents. This was especially apparent among non-drivers and adolescents with low engagement in environmental behaviours, who reported lower intentions to drive after viewing a loss-framed ad than participants who were in the gain frame conditions. The persuasiveness of loss-framed ads is supported by the theory of reasoned action, which holds that intentions are a good predictor of actual behaviour (Ajzen & Fishbein, 1980; Kollmus & Agyeman, 2002). Loss frames also generated more negative emotions, such as fear and anger, whereas gain frames generated more positive emotions, such as joy and contentment. Negative emotions have been shown to trigger avoidance behaviours, supporting the effectiveness of loss frames in discouraging undesirable behaviours (Dienstbier et al., 1975; Weiner, 1980).
Generally, the effect of threat type was inconclusive, but the findings do offer opportunities for further research. For example, the discovery that physical threat generates more negative emotions, particularly sadness, than social threat may provide some support for its effectiveness. Threat effects were not found on behavioural intention. Therefore, the threat type of a message may not have a significant impact on behaviour if it is not combined with framing manipulation.

Frame and threat factors were found to interact to influence behaviour and should both be considered when designing messages for social marketing campaigns. The most effective combination may in fact depend upon the measure used to assess its influence on behaviour. In particular, the findings suggest that the effect of frame and threat interaction may be most prominent in changing attitudes towards the behaviour. On the perception of driving as beneficial and important, physical loss and social gain ads appear to be more persuasive than physical gain and social loss ads. Despite the immediate effectiveness of physical loss ads, however, their long-term impact is unclear, as has been suggested by Hastings, Stead, and Webb (2004). Participants in the physical loss ad condition were less likely to agree that reducing personal vehicle would benefit the environment than those in other conditions and tended to report feeling sad or depressed. Thus, loss frames paired with physical threat may actually diminish the personal responsibility ascribed to the consequences of behaviour and the sense of self-efficacy to make an impact. Based on reported driving intentions, social loss ads may be more effective for females, which is consistent with studies that have demonstrated a stronger peer influence on females (Abernathy et al., 1995; Bird & Tapp, 2008; Kobus, 2003). Despite the support for loss-framed ads, gain framing, especially when paired with physical threat, may be more effective for adolescents who are already engaging in environmentally sustainable behaviour.
This study also highlights the need for social marketers to recognize that the adolescent population is not a homogenous audience. Segmenting the adolescent population based on gender, driving frequency, and level of engagement in environmental behaviours would aid in identifying the appropriate message frame to use in campaigns (Straughan & Roberts, 1999). Females tend to hold weaker positive attitudes towards driving and stronger environmental attitudes than males; they may be more susceptible in general to all messages that call for the reduction of driving practices and the adoption of environmentally sustainable behaviours. The interaction of framing with driving frequency and level of environmental behaviour is consistent with the transtheoretical model, which suggests that the most effective approach may depend on the stages of change of the target audience (Prochaska et al., 1992).

Older adolescents who already drive at a high frequency have significantly more positive attitudes towards driving and are more likely to believe that reducing personal vehicle use would not benefit the environment. More analyses are needed to test the strength of this correlation; nonetheless, initial findings suggest that this group may be more resistant to change and the indoctrination of sustainable transportation behaviours should begin before adolescents are of eligible driving age. Another important influence on the future driving behaviour of adolescents may be parental driving habits. Educating parents of the merits and safety of alternative transportation and the personal and environmental consequences of personal vehicle use may have a substantial impact on adolescents’ future driving behaviour.

Certainly, youth appear to be open to adopting alternative modes of transportation, provided that they are accessible, efficient, convenient, and affordable. The most cited factor that would convince them to reduce driving habits and to choose alternatives was improved infrastructure for alternative options, especially more convenient public transportation. This
suggests that the major motivation for adolescents to choose alternatives may be personal benefits and costs, rather than a strong concern for environmental sustainability. Participants on the whole did not perceive personal vehicle use as an unsustainable behaviour.

Despite the knowledge of environmental problems, adolescents are less aware of the impact of their own behaviour, such as driving, on these global issues; campaigns to change behaviour should attempt to establish this missing link. The effects of frame and threat notwithstanding, a need for greater awareness overall was frequently cited as a key factor in changing adolescents’ behaviour. Indeed, all of the ads were received positively and many participants reported feeling more informed and more likely to reduce their driving behaviour as a result of participating in this study. Across all four conditions, participants also rated their own positive driving attitudes as weaker than their friends’ driving attitudes after viewing the ads, suggesting that the increased awareness from participating in this study alone had a positive effect on the youth. These findings imply that the research process itself as well as increased efforts in social marketing and other forms of persuasive communication for environmental behaviours can only be beneficial for society.

This study sought to strengthen the field of social marketing and the results address some of the gaps in framing literature. More research is needed on the role of gender, level of driving frequency, and level of engagement in environmental behaviour in determining driving behaviour and effective interventions. Studies of the interaction of frame and threat factors should be conducted on other environmental behaviours in order to strengthen the applicability of these findings on influencing sustainable behaviour change in youth. Furthermore, determining effective approaches for adolescents requires more research that compares the influences of message framing between adolescents and adults. Finally, as social marketing can
play a crucial role in influencing individual behavioural change, greater efforts need to be made on applying research findings into actual programs and campaigns designed to encourage environmentally sustainable behaviour in adolescents.

A summary of recommendations is thus as follows:

**Recommendations for future social marketing campaigns:**

- Consider both frame and threat factors when creating messages
- Segment the adolescent population by gender and current patterns of behaviour before selecting appropriate approaches
- Design programs that increase *personal* benefits and decrease costs of the behaviour
- Apply findings from behavioural research
- Increase efforts overall to raise awareness of the link between individual behaviour and global issues

**Recommendations for reducing personal vehicle use in adolescents:**

- Target efforts at younger adolescents before they reach eligible driving age
- Educate parents of the merits and safety of alternative transportation and the personal and environmental consequences of personal vehicle use
- Improve infrastructure for transportation alternatives, such as public transit

**Recommendations for further research:**

- Further investigate the effects of social and physical threats in environmental communications
- Further examine the role of market segmentation in predicting effective interventions
- Compare the influences of message framing between adolescents and adults
- More research on determinants of environmentally sustainable behaviour in adolescents
6.0 LIMITATIONS

There were several limitations in the methodology of this study. The recruited sample for the study may not have been representative of the suburban adolescent population. Due to bureaucratic barriers to research on adolescents, surveying was completed in community centres and shopping malls, which may be frequented by certain subgroups of adolescents. For instance, a large number of participants were young athletes attending sporting events, who are more likely to be physically active than the general adolescent population. In addition, there were more non-drivers in the recruited example than was expected. In the original study design, follow-up interviews were to be conducted with participants. Given time constraints, these follow-up interviews were not completed.

While there is an abundance of research on loss and gain framing effects, social and physical threat has only been examined in the context of fear appeals. In retrospect, “social threat” and “physical threat” may not be the most appropriate labels for this type of manipulation. Participants found the threat manipulation to be somewhat confusing, as indicated by the manipulation check, which led to inconclusive results. Clearer definitions of social and physical threat or the rephrasing of manipulation check items may have produced stronger findings.

The threat manipulation may have also been unclear in the stimulus ads. Participants in the social loss condition scored lowest on confound variables, albeit statistical analysis found this difference to be insignificant. The stimulus ads used in the study were created by the researchers and were not professionally designed. Despite efforts to maintain consistency among the ads, it is possible that variations in the design and aesthetic appeal may have influenced participants’ responses to certain measures.
Participants may have been influenced by demand characteristics, which refers to the phenomenon where experimental participants unconsciously change their responses based on their interpretation of the purpose of the experiment (Orne, 1962). Participants’ awareness that the study was being conducted by the Department of Environment and Resource Studies may have primed interpretations of the driving ads as emphasizing the environmental benefits and costs of driving. This may have contributed to some of the ambivalence over the social threat ads, which they likely anticipated to deliver an “environmental” message.

Some of the items in the questionnaire appeared to be confusing for participants. A few of the participants asked for clarification on the meaning of certain words, such as “sustainable” and “contented”. The measures for driving intention may also have been unclear due to the order of the questions. It is unknown whether participants rated each intention item independently or interpreted the set of items as a ranking. For example, they may have reported low intention to “drive at least once in the future” because they reported high intention to “drive regularly in the future”. It appears that the difference between rating and ranking was unclear to the participants; there were many invalid responses to the item that asked participants to rank factors they considered when choosing between driving and alternatives. The questionnaire would have also been improved if audience segmentation had been considered prior to the survey design. On the other hand, the findings on the influence of other variables, such as gender and driving frequency, suggest opportunities for future research.

Finally, some caution should be taken when interpreting the results of experimental research. Due to limitations of the study design, actual behaviour was not observed and only behavioural intentions were used as a measure of future behaviour. While this approach is quite common in behavioural research, the real-world applicability of such studies is not consistent
and may have limited external validity (Hastings et al., 2004). Nonetheless, the results of this study are intriguing and have important implications on the design of messages in environmental communications for youth and on the field of social marketing.
7.0 CONCLUSIONS

To date, there has been a lack of research exploring the effects of message framing on environmentally sustainable behaviour. Given the urgency of the environmental crisis and the well-documented knowledge-action gap, research on how to effectively encourage environmental behaviours in youth is becoming increasingly pertinent. This study contributed to this much-needed research by examining the interaction of message frame (gain vs. loss) and threat factors (social vs. physical) on sustainable behaviours in the context of social marketing. Personal vehicle use was the case behaviour of interest in the study. Frame and threat factors were found to significantly influence affective arousal, driving attitudes, and behavioural intentions. Overall, loss-framed ads were found to be more effective than gain-framed ads; the effect of threat type was inconclusive. The results suggest that the most effective approach may depend on gender, driving frequency, and level of engagement in environmental behaviour.

This study opens up several avenues for research and real-world applications. Further research on the influence of message framing and the role of audience segmentation in behavioural change strategies will enhance and strengthen current practices in social marketing. This study, which was an adaptation of research findings on health-related behaviours, affirms the applicability of strategies in health behaviour interventions on environmentally sustainable behaviours. Furthermore, this research suggests that youth can be significantly influenced by social marketing campaigns to adopt environmentally sustainable behaviours, providing optimism for the crucial role that social marketing can play in fostering a sustainable society.
REFERENCES


Norman, G. (in press). Likert scales, levels of measurement and the “laws” of statistics. *Advances in Health Sciences Education.*


## Appendix A – Surveying Venues

<table>
<thead>
<tr>
<th>Date(s)</th>
<th>Facility</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, January 8</td>
<td>Milliken Mills Community Centre</td>
<td>7600 Kennedy Road Markham, Ontario</td>
</tr>
<tr>
<td>Friday, January 8</td>
<td>Markville Mall</td>
<td>5000 Highway 7 East Markham, Ontario</td>
</tr>
<tr>
<td>Monday, January 25</td>
<td>Markville Mall</td>
<td>5000 Highway 7 East Markham, Ontario</td>
</tr>
<tr>
<td>Saturday, January 9</td>
<td>Centennial Community Centre</td>
<td>8600 McCowan Road Markham, Ontario</td>
</tr>
<tr>
<td>Sunday, January 10</td>
<td>Centennial Community Centre</td>
<td>8600 McCowan Road Markham, Ontario</td>
</tr>
<tr>
<td>Monday, January 11</td>
<td>Armadale Community Centre</td>
<td>2401 Denison Street Markham, Ontario</td>
</tr>
<tr>
<td>Tuesday, January 12</td>
<td>Albert McCormick Community Centre</td>
<td>500 Parkside Drive Waterloo, Ontario</td>
</tr>
<tr>
<td>Saturday, January 16</td>
<td>Albert McCormick Community Centre</td>
<td>500 Parkside Drive Waterloo, Ontario</td>
</tr>
<tr>
<td>Wednesday, January 13</td>
<td>Waterloo Memorial Recreation Complex</td>
<td>101 Father David Bauer Drive Waterloo, Ontario</td>
</tr>
<tr>
<td>Saturday, January 16</td>
<td>RIM Park</td>
<td>2001 University Avenue East Waterloo, Ontario</td>
</tr>
<tr>
<td>Sunday, January 17</td>
<td>RIM Park</td>
<td>2001 University Avenue East Waterloo, Ontario</td>
</tr>
<tr>
<td>Thursday, January 21</td>
<td>Kitchener Collegiate Institute</td>
<td>787 King Street West Kitchener, Ontario</td>
</tr>
<tr>
<td>Saturday, January 23</td>
<td>Angus Glen Community Centre</td>
<td>3990 Major Mackenzie Drive East Markham, Ontario</td>
</tr>
<tr>
<td>Sunday, January 24</td>
<td>Thornhill Community Centre</td>
<td>7755 Bayview Avenue Markham, Ontario</td>
</tr>
</tbody>
</table>
Social Marketing and Driving Behaviours Survey

1. Are you:  
   [ ] Male  [ ] Female

2. What is your year of birth? ______________

3. What are the first three characters of your postal code? __ __ __

4. Rate the following statements on a scale of 1 (strongly disagree) to 5 (strongly agree): (Circle one number)

   a. This ad focused on the advantages of not driving.  
      1  2  3  4  5

   b. This ad focused on the disadvantages of driving. 
      1  2  3  4  5

   c. This ad showed the positive things that can happen if one drives less. 
      1  2  3  4  5

   d. This ad showed the negative things that can happen if one drives.  
      1  2  3  4  5

   e. This ad focused on the physical effects of not driving.  
      1  2  3  4  5

   f. This ad focused on the social effects of not driving.  
      1  2  3  4  5

   g. This ad stressed the results of driving on the environment.  
      1  2  3  4  5

   h. This ad stressed the results of driving on what others think of me.  
      1  2  3  4  5

5. How did this ad make you feel? ___________________________________________________________________
   ______________________________________________________________________________________________
   ______________________________________________________________________________________________

6. Rate the following statements on a scale of 1 (strongly disagree) to 5 (strongly agree): (Circle one number)

   a. This ad was informative  
      1  2  3  4  5

   b. I understand the message of the ad. 
      1  2  3  4  5

   c. This ad was realistic. 
      1  2  3  4  5

   d. I can relate to the ad. 
      1  2  3  4  5

7. Rate the following statements on a scale of 1 (strongly disagree) to 5 (strongly agree): (Circle one number)

   a. I like the ad a lot.  
      1  2  3  4  5

   b. This is an ad that I would remember. 
      1  2  3  4  5

   c. This ad would be appealing to people like me. 
      1  2  3  4  5

   d. After viewing the ad, I would consider driving less often. 
      1  2  3  4  5
8. How much did this ad make you feel... (Circle one number) 
   a. Happy          1 2 3 4 5
   b. Joyful          1 2 3 4 5
   c. Contented       1 2 3 4 5
   d. Peaceful        1 2 3 4 5
   e. Angry           1 2 3 4 5
   f. Annoyed         1 2 3 4 5
   g. Afraid          1 2 3 4 5
   h. Sad             1 2 3 4 5

9. After seeing the ad, how beneficial do you consider driving to be? (Circle one number) 
   Not at all          Extremely beneficial
   1 2 3 4 5

10. After seeing the ad, how important do you consider driving to be? (Circle one number) 
    Not at all           Extremely important
    1 2 3 4 5

11. How many vehicles are leased or owned in your household? _______

12. Do you have a valid driver’s license? (Circle one)  Yes  No  N/A
   a. If yes, what level is your driver’s license?  G1 G2 G Other _____________

13. How many of your friends hold driver’s licenses? (Circle one number)  None of them          All of them
    1 2 3 4 5

14. How often do your friends drive on average? (Check one box) 
   □ Never  □ 1-2 times a week  □ 3-4 times a week  □ 5-7 times a week  □ Over 7 times a week

15. How often do your parents drive? (Check one box) 
   □ Never  □ 1-2 times a week  □ 3-4 times a week  □ 5-7 times a week  □ Over 7 times a week

16. How often do you ride as a passenger in a personal vehicle? (Check one box) 
   □ Never  □ 1-2 times a week  □ 3-4 times a week  □ 5-7 times a week  □ Over 7 times a week

17. Have you ever driven before? (Circle one)   Yes   No   N/A

18. How often do you drive? (Check one box) 
   □ Never  □ 1-2 times a week  □ 3-4 times a week  □ 5-7 times a week  □ Over 7 times a week

19. Where do you go when you drive? (Check all that apply.) 
   □ School    □ Work    □ Friends’ houses    □ Shopping    □ Out with friends
   □ Other: ___________________________________________________________________________________

20. What factors do you consider when deciding between driving and alternatives, such as walking, biking, and public transit? Please rank the following statements from 1 (Most important factor) to 7 (Least important factor).
   ____ Time        ____ Convenience        ____ Availability/accessibility of alternatives
   ____ Cost        ____ Distance           ____ Popularity
   ____ Other: ____________________________________________
21. Rate the following statements on a scale of 1 (strongly disagree) to 5 (strongly agree): (Circle one number)

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I intend to drive at least once in the future.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>b. I intend to drive occasionally in the future.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>c. I intend to drive regularly in the future.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>d. I intend to drive more often in the future than I do now.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>e. I intend to drive less often in the future than I do now.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>f. I intend to drive at about the same frequency that I do now.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

22. I think driving is… (Circle one number)

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Good</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>b. Necessary</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>c. Convenient</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>d. Independent</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>e. Cool</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>f. Boring</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>g. Normal</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>h. Inefficient</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>i. Bad</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>j. Fun</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>k. Relaxing</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>l. Thrilling</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>m. Other:</td>
<td>____________________________</td>
<td></td>
</tr>
</tbody>
</table>

23. My friends think driving is… (Circle one number)

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Good</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>b. Necessary</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>c. Convenient</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>d. Independent</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>e. Cool</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>f. Boring</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
24. My friends think driving is… (Circle one number)  

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Normal</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>b. Inefficient</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>c. Bad</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>d. Fun</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>e. Relaxing</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>f. Thrilling</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>g. Other:</td>
<td>__________________</td>
<td></td>
</tr>
</tbody>
</table>

25. Rate the following statements on a scale of 1 (strongly disagree) to 5 (strongly agree): (Circle one number)  

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Protecting the environment is important to me.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>b. I feel uninformed about environmental issues.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>c. Personal vehicle use is an unsustainable behaviour.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>d. Reducing personal vehicle use will not benefit the environment.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

26. To what extent do you engage in the following behaviours: (Circle one number)  

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>1 2 3 4 5</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Turn off lights and electrically powered appliances when not in use.</td>
<td>1 2 3 4 5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>b. Walk or ride a bike for short distances (within 15 minutes).</td>
<td>1 2 3 4 5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>c. Reuse shopping bags.</td>
<td>1 2 3 4 5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>d. Recycle.</td>
<td>1 2 3 4 5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>e. Buy certified organic foods.</td>
<td>1 2 3 4 5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>f. Point out unsustainable behaviour to someone.</td>
<td>1 2 3 4 5</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

27. What would it take to get you to reduce or minimize your current driving habits? To choose alternatives?

____________________________________________________________________________________________
____________________________________________________________________________________________
____________________________________________________________________________________________
____________________________________________________________________________________________
WHERE OUR DRIVING IS REALLY TAKING US.

Driving Fact #1:
The average car emits 4 tonnes of pollutants annually, causing almost 2000 premature deaths in Ontario alone.

it’s not that far. ditch the car.
walk - bus - carpool - skate - subway - bike - run - rideshare
the world is our canvas
so let's paint something beautiful

Driving Fact #1:
Each year, Canadians make 2,000 car trips for distances less than 3km. Many of these trips could easily be done on foot, by transit or on a bicycle.

it's not that far. ditch the car.
MYTH: Cars give you freedom

FACT: You give your freedom to cars

Driving Fact #1:
We always see ads with cars on empty roads, but never in the middle of a traffic jam. Someone needs a reality check.

it's not that far. ditch the car.
walk - bus - carpool - skate - subway - bike - run - rideshare
Driving Fact #1: The average Canadian spends over 275 hours driving to and from work each year.

THIS IS HOW WE ROLL.

it's not that far. ditch the car.
walk - bus - carpool - skate - subway - bike - run - rideshare
APPENDIX D
Qualitative Data
Appendix D - Qualitative Data

How did this ad make you feel?

a) Physical Loss
- Cars cause pollution/are bad for environment or health (25)
- I/using alternatives can make a difference/save the environment (8)
- Affect: Sad/depressed (6), Worried (3), Bad/Guilty (2), Shocked (2), Nice/Happy (2), Inspired/Motivated (1), Confused (1), Surprised (1), Nothing (1)
- More aware (5)
- Feel like not driving/People drive too much (2)
- Made me think (2)
- Want to use more alternative modes of transportation (1)
- Want to drive (1)

Select Quotes
- Makes me think that everything we do comes with a price
- That we have a grim future ahead of us if we continue to drive cars that emit deadly pollutants into the air.
- I feel bad that so many people drive when there are easy environmentally friendlier alternatives. I wish my generation would pay attention.
- Guilty about the amount of unnecessary driving Canadians do

Ad comments
- I like the “where our driving…” yet I think if you want to catch the audience’s attention, have less words, use more of an eye catching word.

b) Physical Gain
- I/using alternatives can make a difference/save the environment (12)
- Want to use more alternative modes of transportation (12)
- Feel like not driving/People drive too much (7)
- Affect: Nice/Happy (7), Bad/Guilty (4), Selfish (3), Inspired/motivated (1), Sad/depressed (1), Nothing (1),
- Cars cause pollution/are bad for environment or health (5)
- More aware (4)
- Made me think (2)

Select Quotes
- It made me feel like I want to make a difference in the world
- Makes me want to get active, walk and ride a bike
- Selfish, almost as though driving for my own reasons might ruin everything.

Ad comments
- The use of colours was eye-catching and when I read it
- It’s a pretty picture
- Confused the can is clustered and I don’t want to put the effort in reading it
- Pleasant design (the sun, grass, trees, etc.) and I like the fact that it didn’t state any negative effects, but focused on the positives
- Happy because of the bright colours at first glance
- It looks good but in the end I don’t think there are enough stats to affect me
• Too much happy scenery, most people wouldn’t bother looking at the bottom so I thought it was something about not littering
• The canvas and painting part is confusing.
• If I saw this ad on streets or wherever, I probably wouldn’t notice or pay attention to it. Not very captivating and doesn’t point out the negativity.
• Really positive, bright colours, good message

c) Social Loss
• Want to/should use more alternative modes of transportation (11)
• Feel like not driving/People drive too much (9)
• Made me think (8)
• More aware (7)
• Cars cause pollution/are bad for environment or health (7)
• I/using alternatives/driving less can make a difference/save the environment (5)
• Affect: Confused (3), Nice/Happy (1), Intrigued (1), Amused (1)
Select Quotes
• Wanting to take the bus and ditch the car
• Driving alone is not the only way of transportation
• Makes me feel that there are lots of other ways to get to places and you can stay fit if you don’t drive
• I think it’s great, definitely proves something, the fact that cars are not advertised through reality is quite true, and I personally wasn’t aware of that until now

Ad Comments
• It gave me lots of options besides driving
• The myth/fact and ‘driving fact’ was confusing
• It was eye-catching at first, then after reading made me think
• After the survey I understand the poster but the myth-fact thing was confusing
• Confused, they give me a mixed message about driving
• Amused, the car-strapped figure pwned was a nice touch. It left me more receptive to the idea that there are better options than driving

d) Social Gain
• Feel like not driving/People drive too much (14)
• Want to use more alternative modes of transportation (14)
• I/using alternatives can make a difference/save the environment (7)
• More aware (5)
• Affect: Nice/Happy/Good (3), Energetic/Excited (2), Inspired/motivated (1), Confused (1), Surprised (1), Nothing (1)
• Cars cause pollution/are bad for environment or health (1)
• Made me think (1)
Select Quotes
• Made me want to not drive a car
• Like using methods of transportation other than driving is cool
• That not driving is more social and fun
• That alternative methods of travel are more ‘hip’ so it makes me want to … well, ditch the car
Ad comments

- It’s colourful and attention grabbing, but I do not understand right away that it is about environmental issues.
- I understand the general message behind it, however it didn’t quite convince me why I shouldn’t drive.
- It made me feel like they were trying to reach a certain generation.
- Shows many ways to get around without cars and puts them in a positive light. When I first saw it, though, I didn’t know that it was about environmental stuff.
- Good ad, good ideas, angled towards boys? “This is how we roll” – angry letters.
- The slogan will most likely get stuck in my head.
- It’s creative and draws the eye because of how it relates to the teen. I feel energetic because of its colour and theme.
- This ad did not really tell me the reason for not driving.
- It looks like an ad for activities (extra-curricular) or a competition rather than for environmental reasons.
- At first I was confused about what the ad was about because there was little cohesiveness in the poster. Also it did not really stress any dangers of driving.
- The pictures are good, showing alternatives.
- I didn’t know what the ad was about until I read the bottom text.
- Very excited, what with all the bright colours and crazy designs.
- It makes the ‘ditch the car’ statement look trendier, although it does so in a stereotypical youth poster style (bold colours, silhouettes, unique font, etc.).

Where do you go when you drive?

- Sports-related (practice, out of town games) (32)
- Everywhere, most places, around the neighbourhood, errands (8)
- Practice driving (5)
- Out of town (3)
- Out of school activities (e.g. dance class) (3)
- Movies & restaurants (3)
- Library (2)
- Drive my parents around
- Cottage
- Back dirt roads
- Church
What factors do you consider when deciding between driving and alternatives, such as walking, biking, and public transit?

- Energy/Mood (4)
- Weather (3)
- Environment (2)
- Necessity/Practicality (e.g. whether I have a ride or not, where I’m going) (3)
- Fuel prices
- Speed
- Friend’s opinions
- The day (weekend vs. weekday)

I think driving is...

- Amazing (3)
- A lifestyle thing
- Sweet
- Scary
- Faster
- Nice
- Bad for the environment

My friends think driving is...

- Amazing (2)
- Awesome
- Faster

What would it take to get you to reduce or minimize your current driving habits? To choose alternatives?

- Better infrastructure for alternatives (e.g. more efficient and convenient, more options, safety, bike paths) (30)
- Better public transportation (6)
  - More convenient (e.g. routes come more often, go to more places) (37)
  - Efficient (i.e. less time consuming) (18)
  - Cheaper (29)
  - Comfort (1)
- Listed alternatives (e.g. bike, subway, walk) (26)
- General awareness (e.g. through advertisements) (9)
  - Awareness/evidence of driving consequences (16)
  - Awareness of alternatives (2)
- Warmer weather (15)
- Distance (e.g. not going as far, living closer to places, easier to access) (14)
- Increasing expenses/not having money (fuel cost, car prices) (12)
- Environmental sustainability reasons (e.g. pollution, global warming) (11)
- Unwilling to change (9)
- Reward/pay me (9)
- Peer/parental influence/support (7)
- Cars (if they were uglier, if there were more efficient options) (8)
- More time (4)
- Policy (3)
- Exercise/staying in shape (2)

Select Quotes
- It would take cheaper bus fares and more bus routes and more buses. More bike racks would be good though
- If there were more people to inform me of what my bad habits are causing I would realize and remember that I can help the environment if I just took the time to try and help
- I think that minimizing driving habits and choosing alternatives would always be considered first for me. Then I weigh my options. If it benefits more to do the alternatives, I choose the alternatives to the extent that I can.
- If it was more accessible. Perhaps adding bike lanes or just making the sidewalk seem more appealing
- I am very open to public transit and carpooling. Bus fares are increasing and that only decreases my desire to reduce my driving habits.
- Parents need to feel reassured about the alternatives of driving.
- I choose not to drive because it helps the environment and do a lot more stuff to help the environment
- I don't drive but in the future I will make sure to only drive if necessary
- I don't drive but this is informative (2)
- Would take something bad that happened to a lot of people, but to choose an alternative, I guess just thinking about the environment would make me want to
- Make transit easier in the city, make bike routes and safe ways to travel. Make bus routes more accessible. Make snow go away. Use hybrid cars, they're cool!
- If public transport was more convenient, cheaper, faster, more frequent!
- I would do it without anything in return to save our environment
- It would take an informational session, to help educate me more about the environment and its current state of health to minimize my current driving habits and to choose alternatives
- I would definitely need incentives or alternatives that help balance the inconvenience of driving less
- I think we need to support and demand electrical vehicles so that people can still travel at their own convenience and luxury, plus it’s cheaper in the long run.
- It would take a lot of awareness. People need to know that they are destroying the environment by driving. There are other ways of transportation that can be used and not abused. It would have to be a group effort and everyone will have to know. I will think twice about driving in the future.
APPENDIX E
Participant Letters and Forms
Dear Participant:

This letter is an invitation to participate in a research study. As undergraduate students in the Department of Environment and Resource Studies at the University of Waterloo, we are currently conducting research under the supervision of Professor Jennifer Lynes on the effects of message framing in social marketing campaigns for sustainable behaviour.

**Study Overview**

Moving towards a sustainable society requires significant lifestyle changes, especially among youth. One method of influencing behavioural change is social marketing, the use of commercial marketing principles to influence behaviours that benefit society. A component of social marketing is message framing, which involves communicating the risk associated with a behaviour change as either perceived gains (gain frame) or losses (loss frame). This purpose of this study is to examine the effectiveness of various types of message frames in social marketing campaigns for sustainable behaviour change in youth.

The research will be carried out in two parts. First, preliminary research will be conducted by examining the literature on social marketing, message framing, and social norms among youth. Second, a study will be conducted on youths aged 14 to 18 looking at the effects of four types of message frames on reducing personal vehicle use. Social marketing products will be tested on youth participants via surveys and interviews for their effectiveness in influencing the case behaviour.

**Your Involvement**

There are two phases to this project. If you agree to participate in the first phase of this study, you will be shown a social marketing product and asked to complete a short survey, which would take 15 minutes of your time. Participation in this project is completely voluntary and there are no known or anticipated risks to participation in this study. You may decide to withdraw from this study at any time. If there are any questions that you prefer not to answer, you may skip them. In appreciation of your time, we will provide you with a $2 gift certificate for completing phase one of the study.

In the second phase of the study, we would like to conduct follow-up telephone or in-person interviews with those who are willing from the group that has filled out the survey. This would take place in a mutually agreed upon location at a mutually agreed upon time. Participation in the interview would again be completely voluntary and you may decline answering any questions you prefer not to answer. Your involvement in the first phase of the study does not obligate you to participate in the second part. In appreciation of your time, you will be entered into a draw for a $20 gift certificate for completing phase two of the study.

All information you provide will be considered confidential, and the data collected will be kept in a secure location and confidentially disposed of within five years time. Your name will not appear in any thesis or publication resulting from this study. There are no known or anticipated risks to participation in this study.
Contact Information
If you have any questions regarding this study, or would like additional information about participation, please contact us at 519-590-0411 or by email (t2cheng@uwaterloo.ca or dwoon@uwaterloo.ca). You can also contact our supervisor Professor Jennifer Lynes by telephone at 1-519-888-4567 ext. 35487 or by email at jklynes@uwaterloo.ca.

We assure you that this study has been reviewed and received ethics clearance through the Office of Research Ethics at the University of Waterloo. However, the final decision to participate is yours. If you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes of this office at 1-519-888-4567 ext. 36005 or ssykes@uwaterloo.ca.

Thank you in advance for your interest and assistance with this research.

Yours very truly,

Tania Cheng          Danielle Woon
BES Candidate        BES Candidate
CONSENT FORM
By signing this consent form, you are not waiving your legal rights or releasing the investigator(s) or involved institution(s) from their legal and professional responsibilities.

I have read the information presented in the information letter about a study being conducted by Tania Cheng and Danielle Woon of the Department of Environment and Resource Studies at the University of Waterloo, under the supervision of Professor Jennifer Lynes. I have had an opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted. As a participant in this study, I realize that in Phase I, I will be asked to complete a survey after being shown a social marketing product. As a participant in this study, I am aware that I may decline to answer any question that I prefer not to answer.

I am also aware that excerpts from the survey may be included in the thesis and/or publications to come from the research, with the understanding that quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

This project has been reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. I was informed that if I have any comments or concerns resulting from my participation in this study, I may contact the Director, Office of Research Ethics at 519-888-4567 ext. 36005.

I agree to participate in Phase I of this study
[View social marketing product and complete short survey (15 minutes)]
☐ Yes ☐ No

I also agree to participate in Phase II
[Follow-up telephone or in-person interview (10-15 minutes)]
☐ Yes ☐ No

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.
☐ Yes ☐ No

Participant Name: ____________________________________(Please print)
Participant Signature: ____________________________________________

Witness Name: ____________________________________(Please print)
Witness Signature: ____________________________________________

Date: ____________________________________________
Dear Participant,

We would like to thank you for your participation in this study. As a reminder, the purpose of this study is to examine the effectiveness of various types of message frames in social marketing campaigns for sustainable behaviour change in youth.

The data collected from these surveys will contribute to a better understanding of how to influence sustainable behaviour change in youth by addressing gaps in existing literature on the use of message framing in environmental campaigns and by providing insight on how the barrier of social norms can be transformed into tools for reaching youth.

Please remember that any data pertaining to you as an individual participant will be kept confidential. Once all the data are collected and analyzed for this project, we plan on sharing this information with the research community through a research conference showcasing undergraduate Environment and Resource Studies students’ theses as well as in a research paper which may be submitted to a related journal. If you are interested in receiving more information regarding the results of this study, or if you have any questions or concerns, please contact us at either the phone number or email address listed at the bottom of the page. If you would like a summary of the results, please let us know now by providing us with your email or mailing address. When the study is completed, we will send it to you. The study is expected to be completed by the end of April 2010.

As with all University of Waterloo projects involving human participants, this project was reviewed by, and received ethics clearance through, the Office of Research Ethics at the University of Waterloo. Should you have any comments or concerns resulting from your participation in this study, please contact Dr. Susan Sykes in the Office of Research Ethics at 519-888-4567, Ext. 36005 or ssykes@uwaterloo.ca.

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References Related to this Study