

The Problem with Too Much Fear: Testing the Interaction between Fear Appeals, Message  
Framing and Visual Metaphors

by

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## **Author's Declaration**

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

## Abstract

In Canada, recreational activities account for 60% of all drowning related deaths (LSS, 2012). How can we influence people to adopt safe behaviours while engaging in recreational activity around the water? One popular method for altering or maintaining behaviours is through the use of fear appeals. Unfortunately, such appeals can be problematic. If they create too fearful a response, they compromise their own efficacy. Humour has been promoted as one possible solution to mitigate these effects (Mukherjee & Dubé, 2012). However, in many cases, humour may be inappropriate to use in combination with fear appeals. In response to this problem, this study turns to the use of visual metaphors.

This study uses the Elaboration Likelihood model (ELM; Petty & Cacioppo, 1986) and Protection Motivation theory (PMT; Rogers, 1983) as a framework for understanding persuasive communication. It tests the relationship between fear, message framing, protection motivation and the use of visual metaphors. It was hypothesized that visual metaphors will function largely like the use of humour. In particular, visual metaphors will interact with high-fear and consequently lead to increased persuasion.

Results suggest that those who reported being able to swim longer distances were less likely to intend to wear a life jacket [ $F(3,171)=5.17, p=0.002$ ]. Regression suggested that two significant predictors help form intentions to wear a life jacket. Those who focused on barriers to wearing a life jacket formed weaker intentions to wear a life jacket. Also, those who reported consuming alcohol more frequently while boating were less likely to intend to wear a life jacket.

Males and females differed significantly in many of their responses. Males ( $M=5.50, SD=1.70$ ) were less likely to intend to wear a life jacket than females ( $M=4.50, SD=1.83$ );  $t(167)=3.50, p=0.001$ . A possible explanation is males rated perceptions of severity and

vulnerability as lower as well as rating response costs higher when compared to females. New Canadians (n=13) reported significantly lower scores for self-efficacy (M=5.48, SD= 1.18) than those who have lived in Canada for more than 10 years (M=6.17, SD=0.78);  $t(167)=-2.94$ ,  $p=0.004$ . However, this study fell short of meaningful findings about visual metaphors and their interaction with fear appeals. Visual metaphors did not add a persuasive benefit and did not mitigate defensive responses which may be caused by excessive fear.

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## **List of Abbreviations**

CIHI.....Canadian Institute for Health Information

ELM.....Elaboration likelihood model

LSS.....Lifesaving Society

NFC.....Need for cognition

PMT.....Protection motivation theory

WHO.....World Health Organization

## Chapter 1

Swimming is a popular leisure pursuit. For example, an estimated 54.2% of Americans participated in swimming within the previous year and 62.1% visited a beach or waterside (Cordell, 1999). In Canada, we know that swimming is the third most practiced sport; only ice hockey and golf were more popular among Canadians 15 years and older (Ifedi, 2005). For Canadian women, 15 years and older, swimming is the most popular sport; 19% of active women participated in swimming in 2005 (Ifedi, 2005). Many more participate in a variety of aquatic activities ranging from boating to water skiing.

While leisure offers a variety of sociological, health, psychological, environmental and economic benefits (Shannon, 2007), leisure pursuits may also lead to injury and even death. With respect to the leisure pursuit of water-related activities, the risk of drowning is omnipresent. Drowning is a health problem in Ontario, Canada, and the world. The World Health Organization (WHO) reports that drowning is the third leading cause of unintentional death in the world, accounting for 7% of all injury-related deaths (World Health Organization [WHO], 2014). Each year approximately 388,000 people die worldwide from drowning.

In Canada, recreational activities account for 60% of all drowning related deaths. Drowning incidents had been trending downward annually since 1993; that is, until 2004 when drowning started to increase again (Lifesaving Society [LSS], 2012; 2014). The drowning rate over the five year period of 2006-2010 is 7% higher than the previous five years. This has raised concern over water safety in Canada and is worthy of the attention of researchers and practitioners.

Behavioural choices contribute to drowning. Indeed, McGinnis, Williams-Russon, and Knickman (2002) suggest that each year approximately 900,000 deaths in the United States can be attributed to behavioural choices (e.g. safety behaviours, sexual choices, tobacco consumption, exercise, dietary choices, etc.). With so much at stake, understanding the psychological processes that lead one to choose safe and healthy behaviours over more risky options is of the utmost importance.

This thesis explored the question “how can we influence people to adopt safe behaviours”? This study used the Elaboration Likelihood model (ELM; Petty & Cacioppo, 1986) as a framework for understanding persuasive communication. This theory suggests attitude change can happen through two processes: either through thoughtful, conscious, effortful processing or several less effortful methods such as heuristics. The study also relies on Protection Motivation theory (PMT; Rogers, 1983). PMT describes how people perceive and negotiate a personal injury threat. It theorizes that when negotiating a personal threat prompted by fear, people engage in two cognitive mediating processes: threat appraisal and coping appraisal. If the level of threat is deemed to be high and the recommended coping response effective then people will be motivated to perform that behaviour. However, if either threat is appraised as low or the recommended coping response ineffective then a number of defensive responses may be engaged to reduce the stress and anxiety triggered by fear.

Both theoretical perspectives are used to monitor the differential effects of using a visual metaphor message versus a message using a simpler literal image. In particular, this research focuses on responses to metaphors and the interaction between visual metaphors and fear in a poster advertisement promoting the use of life jackets as a means to stay safe when faced with the threat of open water.

## **Persuasion**

The focus of this study is on persuasive communication. The ELM proposes that the more motivated and able an individual is to assess the merits of a person, issue, or position, the more likely they will be to engage in effortful information processing where they scrutinize the available object-relevant information. On the other hand, if one is unmotivated or unable to process the message persuasion might still occur through a number of peripheral cues such as an attractive source or heuristics. These two processes are not mutually exclusive but may take place simultaneously. ELM has been tested against a variety of source, message, recipient and context variables. Two message types that have been successful in influencing persuasion are fear appeals and metaphors.

## **Fear Appeals**

One method for influencing people to alter or maintain behaviours is through the use of fear appeals. A fear appeal is a message with the intention of eliciting a fearful emotional and cognitive response which motivates an individual to find a way, through trial and error, to relieve distress created by that appeal (Norman, Boer, & Seydel, 2005; Rogers, 1983). The fear appeal often contains behavioural advice. If this behaviour is successful in relieving the individual from their unpleasant emotional state then it will be reinforced.

Decades ago, Rogers (1975), in his first version of the protection motivation theory, hypothesized that the relationship between fear and performing a protective behaviour is an inverted U-shape. Specifically, those individuals who are moderately aroused by fear would be the most likely to perform a protective behaviour and those who were insufficiently aroused or were excessively aroused would be less likely to do so. Over the years several studies have

questioned Rogers' suppositions. For example, two meta-analyses by Sutton (1982) and Witte and Allen (2000), suggest the relationship may be less of an inverted U-shape and more positive and linear. However, Rogers' views are gaining new attention as problems are being identified with the assumption of a positive linear relationship between fear and persuasion. Keller and Block (1999) found, for example, that individuals who were not already performing the recommended response from a fear appeal were more likely to be persuaded by moderate as opposed to high levels of fear tension arousal. In addition, others have found that high levels of fear arousal can trigger defensive responses (e.g. distress-avoidance, discounting vulnerability, reduced message elaboration) which reduce the effectiveness and persuasiveness of the fear appeal (Rippetoe & Rogers, 1987; Keller & Block, 1996; Mukherjee & Dubé, 2012). For the purposes of this study, the inverted U-shaped relationship seems more likely.

**Drawbacks of fear appeals.** One of the great challenges of using fear appeals is the negative cognitive reaction to those appeals. If they create too fearful a response, they compromise their own efficacy. Humour has been promoted as one possible solution. Mukherjee and Dubé (2012) suggest that humour provides a safe context that reduces the need for defensive responses to fear appeals. According to theories on the processing of humour, first, humour presents incongruence, that being, a series of events that do not normally occur together. The incongruence is resolved by a problem solving process, in a playful, diminutive or non-serious manner generating a humour response (Wyer & Collins, 1992; Alden, Mukherjee, & Hoyer, 2000). The playful, diminutive and non-serious nature of humour forms the safe context referred to by Mukherjee and Dubé (2012).

Mukherjee and Dubé (2012) found that, when humour is absent, increasing levels of fear arousal decrease the persuasive potential of the original message. However, the same increase



improves persuasion when humour is present. Most importantly, the process was mediated by a reduction in defensive responses but not by a reduction in fear arousal. They write: “At the broadest level, our results indicate that fear increases motivation to process, while humor increases ability to process the message in the ad” (Mukherjee & Dubé, 2012, p. 154).

Mukherjee and Dubé (2012) suggest that humour increases the ability of an individual to process a message, however, the mechanism through which humour increases persuasion is not very well understood. In many cases, humour may be inappropriate to use in combination with fear appeals. For example, if the humour is interpreted as making light of a serious issue it may be unethical or unwelcome. In response to this problem, this study turns to the use of visual metaphors. Humour shares a great deal of similarities with the use of metaphors, which begs the question, whether metaphors will interact with fear arousal to increase persuasion?

### **Metaphors and Persuasion**

Theories of humour comprehension share many similarities with the *literacy-primacy* theory of metaphor comprehension. Both humour and metaphors present incongruent frames which prompt the interpreter to resolve the frames using a problem-solving process. Incongruity in advertising has been shown to lead to increased message elaboration (Toncar & Munch, 2001). Both lead to positive affect: in the case of humour, a humorous response is generated by resolving frames, where in the case of a metaphor, there is relief and/or pleasure that results from the dissipation of cognitive tension. The question follows that if metaphors and humour are processed in a very similar way, will the incorporation of metaphors into fear appeals lead to an interactive effect which reduces defensive responses and mitigates the effects of high-fear

arousal? Since metaphors and humour share so many common attributes, this question is worthy of study.

## **Visual Metaphors**

Advertisers often rely on visual metaphors to communicate messages about their brands and products (Boozer, Wyld, & Grant, 1991). Visual metaphors are similar to verbal metaphors, however, instead of verbally stating that two objects or concepts are linked analogically, there is an artful representation of these objects. For example, Heinz has used an advertisement depicting a bottle of ketchup which has been shown to be sliced as if it were a tomato. Visual metaphors allow advertisers to communicate that their product or brand has a certain set of attributes without explicitly stating it. Following the prior example, the Heinz ketchup ad wants you to attribute the freshness of tomatoes with their ketchup.

An image can function as an argument: advancing a position even in the absence of verbal anchoring. Images can even be more persuasive than verbal arguments (Bulmer & Buchana-Oliver, 2006). One factor that makes visual metaphors more persuasive than literal messages is that they lead to more message elaboration (Toncar & Munch, 2001). Ad messages presented through images often lead to multiple interpretations by indirectly and implicitly making claims rather than doing so explicitly as in verbal arguments (McQuarrie & Phillips, 2005; Marchand, 1985). The complexity and indirect claims of pictures lead the audience to spend more time and effort processing the message (McQuarrie and Mick, 1996; Jeong, 2008; McQuarrie & Phillips, 2005; van Mulken, van Hooft, & Nederstigt, 2014). Visual metaphors have been shown to be more persuasive than literal and verbal messages (McQuarrie & Phillips, 2005; Jeong, 2008).

## **Protection Motivation Theory (PMT)**

PMT is widely used to understand the psychological processes which affect decision making given a number of health threats. PMT has been applied to a wide variety of health issues including quitting or refraining from smoking cigarettes (e.g. Thrul, Stemler, Buhler, & Kuntsche, 2013), exercise intentions (e.g. Plotnikoff & Trinh, 2010; Fruin, Pratt, & Owen, 1992), safe sex practices (e.g. Bengel, Belz-Mark, & Farin, 1993), dental hygiene and flossing (e.g. Beck & Lund, 1981), preventing hearing loss at the workplace (e.g. Melamed & Rabinowitz, 1996), safe consumption of alcohol (e.g. Ben-Ahron, White, & Phillips, 1995), cancer self-examination (e.g. Rippetoe & Rogers, 1987) and general health protection (e.g. Stanley & Maddux, 1986). In addition, PMT can and has been used to explain a variety of other situations which involve a personal threat and protective behaviour options such as speeding while driving (e.g. Glendon & Walker, 2013), organic food choices (Scarpa & Thiene, 2011), adoption of information systems security policy (Ifinedo, 2012), adoption of anti-plagiarism software (Lee, 2011), and prediction of pro-environmental behaviours (Kim, Jeong, & Hwang, 2012). Of particular interest to this research, PMT was once used to study water safety among beachgoers in New Zealand (McCool, Ameratunga, Moran, & Robinson, 2009).

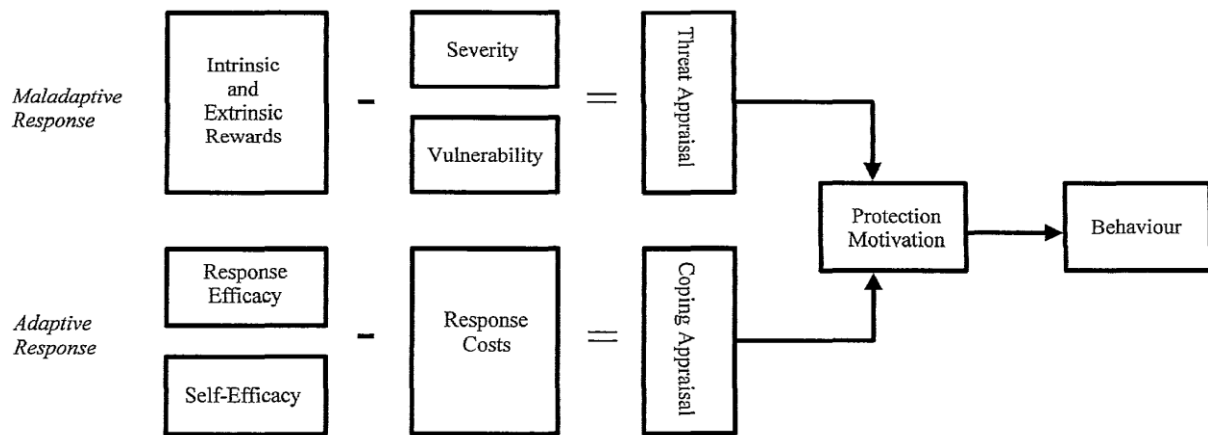


Figure 1 – Protection Motivation theory (Norman *et al.*, 2005)

The PMT model outlines the psychological processes and beliefs which lead to adopting and performing a protective behaviour. PMT is organized along two processes: threat appraisal and coping appraisal. *Threat appraisal* is a cost-benefit analysis of performing a maladaptive response. A maladaptive response would be a behaviour which is successful in reducing fear evoked by the threat but unsuccessful in protecting the individual from the threat (e.g. avoidance, denial, wishful thinking, etc.). If threat is appraised to be sufficiently high then the person will be motivated to reduce their unpleasant emotional state, however, that may not necessarily be in a protective manner. As a result, the pathway for threat appraisal is often referred to as an evaluation of the maladaptive response. The PMT variables in the threat appraisal process are: perceived severity, perceived vulnerability, and fear.

*Perceived severity* refers to the magnitude of noxiousness or the severity of a threatening event. In this study, perceived severity refers to how severe one thinks the consequences of not wearing a life jacket might be. *Perceived vulnerability* is the respondent's perception of how susceptible they are to the threatening event or the likelihood of the threatening event happening

to them. This study is concerned with participants' perception of the likelihood that they may drown if they should choose not to wear a life jacket.

*Fear* is an intervening variable between perceptions of severity and vulnerability and protection motivation. That is to say that, if perceptions of severity and vulnerability are high, then the more fear will be aroused; and with higher levels of fear, the individual would be expected to be more motivated to protect themselves.

Coping appraisal is an individual's evaluation of the factors concerning the recommended response to the threat. The PMT variables in the coping appraisal process are perceptions of self-efficacy, response efficacy, and response costs. *Self-efficacy* is the individual's perception of their ability to perform the recommended response behaviour. *Response efficacy* is the individual's perception of how effective the recommended response will be at reducing the threat. *Response costs* are the barriers to performing the recommended response.

The outcome variable of PMT is protection motivation, which is synonymous with one's intention to carry out the protective behaviour. Perceptions of severity, vulnerability, self-efficacy, response efficacy, and fear are expected to be positively associated with protection motivation whereas response costs are expected to have a negative association.

### **Purpose and Research Questions**

Taken together the literature suggests that 1) fear appeals and metaphors have both been used to positively influence persuasion, 2) humour has been an effective device for reducing defensive responses triggered by high levels of fear, and 3) metaphors are comprehended through a very similar process to humour. What is still unknown is whether metaphors will interact with

fear the same way that humour does: by reducing defensive responses and increasing persuasion under high-fear conditions.

The purpose of this study is to test the relationship between fear, framing, protection motivation and the use of visual metaphors. This study measured the influence of using visual metaphors with fear appeals. This study predicted that visual metaphors will function largely like the use of humour. This study seeks to answer the research question: will the use of visual metaphors in fear appeals mitigate defensive responses caused by high fear arousal?

### **Hypotheses:**

H1: Messages referring to consequences (in this case lives lost or saved due to wearing life jackets) will generate a greater fear response than will a neutral message (referring readers to a website).

H2: Messages referring to negative consequences (in this case death due to drowning) will generate a greater fear response than will messages referring to lives saved.

H3a: Messages intended to create moderate levels of fear will be more persuasive (in terms of intentions to wear a life jacket) than will neutral messages.

H3b: Messages intended to create moderate levels of fear will be more persuasive (in terms of intentions to wear a life jacket) than will high fear messages.

H4: Under high fear conditions, a message using a metaphorical image will be more persuasive (in terms of intentions to wear a life jacket) than one using a literal image.

## **Chapter Two – Literature Review**

This chapter reviews several literatures in helping to understand the nature of decision making under risk and the dynamics behind different types of appeals. In particular, we are interested in the persuasiveness of fear appeals and visual metaphors.

### **Unintended consequences: the dark side of leisure**

As mentioned in the first chapter, leisure sometimes leads to the unfortunate consequence of injury or even death. Skiing and snowboarding, for example, lead to the most hospitalizations of any winter sport with an average of 2,434.6 hospitalizations each season between 2006 and 2011 (Canadian Institute for Health Information [CIHI], 2012). Cycling leads to even more hospitalizations: the most among summer sports and recreational activities. There were 4,324 hospitalizations during the fiscal year of 2009-2010 (CIHI, 2010). Additionally, there were 129 cycling deaths between 2006 and 2010 (Office of the Chief Coroner for Ontario, 2012). Although resulting in far fewer hospitalizations, water-related recreational activities lead to far more deaths. During the same time period, 2006-2010, there have been 2,435 drowning deaths in Canada. In 2010, 60% of all drowning deaths occurred while the deceased was involved in recreational activities (LSS, 2012).

### **The threat of drowning**

Drowning is a health problem in Ontario, Canada, and the world. In Canada, drowning incidents had been trending downward annually since 1993; that is, until 2004 when drowning started to increase again (LSS, 2014). The drowning rate over the most recent five year period for which there is available coroner's data, 2006-2010, is 7% higher than the previous five years,

2001-2005. This has raised concern over water safety in Canada and is worthy of the attention of researchers and practitioners.

The Lifesaving Society of Canada (LSS) has been an advocate for water-safety programs and anti-drowning initiatives for the past century. Their mission is “to prevent drowning and water-related injury through ... training programs, Water Smart public education, safety management services, drowning prevention research and lifesaving sport” (Lifesaving Society, 2013).

The LSS has identified risk factors contributing to drowning in Canada, many of which have a behavioural element (e.g. alcohol consumption, failure to wear a life jacket, swimming after dark, swimming alone, etc.). This study focuses on the behaviour of wearing a life jacket during a canoe trip. Failure to wear a life jacket accounts for 80% of all boating-related drowning fatalities (LSS, 2014). Wearing a life jacket as well as the threat of drowning are seldom studied. To date, only one study has focused on PMT and its relationship with the threat of drowning (McCool *et al.*, 2009).

### **The safety triad and the role of behaviour change in injury prevention**

The factors that contribute to unintentional injury can be categorized into what Geller *et al.* (1990) has termed the safety triad: personal factors, environmental conditions, and safety behaviours. Personal factors refer to the knowledge, skills, and abilities of a person that are related to the avoidance of injury. Additionally, intelligence, personality, and physical condition may play a part. Safety behaviours are those behaviours that contribute to the avoidance and prevention of injury such as safe lane changes while driving a car, putting on a seatbelt, avoiding dangerous rapids in a canoe, supervising young children at a playground, or wearing a life jacket.



These behaviours must be repeated whenever the appropriate hazard is present in order for the behaviour to be effective.

In contrast, environmental conditions can be modified using a ‘one-time’ fix, leading to solutions of this nature being referred to as the passive strategy to injury prevention. From a policy perspective, this has been historically opposed to active strategies which involve safety behaviours. This tension arose out of the unmatched success of immunization and water fluoridation. Additionally, there is some concern that a focus on individual behaviour is akin to “blaming the victim” (Gielen & Sleet, 2003).

However, many technological advances designed to protect people have an active component. Adding safety devices such as safety belts to cars, and four-sided fencing to backyard pools still require that people buckle up and shut the gate respectively. Of course, passive approaches will always be preferred as it only takes a one-time fix to affect an entire body of consumers. Nonetheless, there will always be a need for behaviour change campaigns as we better understand the factors contributing to injury and continue to invent technology which will help keep us safe but require an active component.

Wearing a life jacket is one such behaviour. Despite public awareness campaigns and legislation requiring life jackets for each person in a pleasure craft, failure to wear a life jacket continues to account for a high percentage of boating deaths (Transport Canada, 2013). The following literature on persuasion covers two emerging questions: 1) why do people decide to act in a way which fails to protect them? and 2) how can such behaviour be changed?

The problem is one of perception. Individuals may have inaccurate perceptions of the danger they may face or their ability to cope with danger. Protection Motivation theory predicts

that when threat is appraised to be significant and the response options effective then people will act in a way which protects themselves from harm. In a study on water safety, McCool *et al.* (2009) show that beliefs about the severity of the threat tended to be the most predictive of safe behaviour at the beach. However, those who held beliefs that the threat was not severe were more likely to engage in unsafe behaviour such as swimming in unsupervised areas, swimming at night, or consuming alcohol before swimming. So one solution for encouraging water safety is to alter perceptions that lead to maladaptive behaviours. The literature typically draws on theories of persuasion to do this.

In this paper, I will draw on the literature to make the following argument: 1) people's attitudes can be changed through persuasive communication, 2) fear is an effective tool for communicating a protective behaviour message, 3) however, too much fear leads to defensive responses, 4) humour is an effective tool to mitigate the effects of high-fear arousal, although, in some cases humour may be considered inappropriate (if humour makes light of a serious issue such as death), 5) the processing of humour shares many similarities with the comprehension of metaphorical devices, and 6) using metaphorical devices in combination with fear advertising may lead to the same interactive effect, mitigating the effects of high fear arousal.

## **Theories of Persuasion**

People's attitudes have been considered the 'holy grail' of social psychology because of the long established relationship between them and people's behaviour (Ajzen, 1991). It follows, that if we can change people's attitudes then we can influence their behaviour as well. Several theories of persuasion seek to explain the mechanism of attitude change. The most popular group of these theories is the dual-process theories.

Dual-process theories draw the distinction that people tend to process information in two ways: automatically or in a controlled way. Automatic processes typically have four features: they are unintentional, require little cognitive resources, cannot be stopped voluntarily, and occur outside of conscious awareness (Gawronski & Creighton, 2013). Controlled processes typically operate in the opposite fashion: intentionally, with significant cognitive resources, can be stopped voluntarily, and occur within conscious awareness.

The most popular of these theories is the Elaboration Likelihood Model (ELM; Petty and Cacioppo, 1986). To cover the topic of persuasion, this review will first cover relevant definitions, then describe the ELM. Finally, we'll turn to the relevant source, message, recipient, and context variables which influence persuasion.

**Definitions.** The general goal of persuasion is change of a person's attitudes. Attitudes can be defined as one's evaluative judgement of persons, objects, and issues. An attitude on "Barack Obama", "abortion", or "Honda Civics" refers to how positively (favorably) or negatively (unfavorably) one views such things. Additionally, because of the conceptual and observed similarities between processes of attitude change versus attitude formation, the term persuasion is used to refer to both. Attitudes can be thought of as occupying a position along a continuum from non-attitudes to strong attitudes (Petty & Wegener, 1996). The factors involved in moving one's attitudes from a weak position to a strong position or from no position to a strong position are similar (Petty, Schumann, Richman, & Strathman, 1993).

Petty and Wegener (1996) state that the generic model of attitude change is not necessarily explicitly stated but almost always involves some independent variable having an impact on one's affect, cognitions, or behaviour, which in turn impacts attitudes. They give the

example of a television commercial which induces positive feelings in connection with a political candidate. If these positive feelings become associated with the political candidate then that may lead to a favorable attitude toward them. Almost every causal sequence involving affect, cognitions, behaviour and attitudes has been proposed. For example, self-perception theory (Bem, 1972) proposes that people may come to like an object based on inferences from their own behaviour. Also, of particular relevance to this study, is Leventhal's (1970) parallel response model which theorized that fear could simultaneously have a cognitive response (i.e. danger-control) designed to protect oneself from harm and an emotional response (i.e. fear-control) aimed at protecting oneself from aversive arousal. The affective, cognitive, and behavioural bases of attitudes can be both independent as well as interlinked (Zanna & Rempel, 1988; Rosenberg, 1960).

The origin of people's attitudes on wearing a life jacket is unclear. Conceptually, it is possible that affect, cognition, and behaviour may all play a role in shaping attitudes on wearing a life jacket.

**Elaboration likelihood model.** The ELM concerns the conditions under which a message influences a person's attitudes. The ELM first presupposes that people wish to hold correct views but possess limited cognitive resources with which to process information, and as a result, are forced to process some information with low effort methods as opposed to high effort message elaboration. The ELM proposes that the more motivated and able an individual is to assess the merits of a person, issue, or position (i.e. the attitude object), the more likely they will be to engage in effortful information processing where they scrutinize the available object-relevant information (i.e. that information contained in the persuasive message in addition to previously held knowledge). Motivation and ability to process compose a key element of ELM:

the elaboration likelihood continuum. At the high end of the spectrum is effortful message elaboration. After assessing relevant object related information, individuals arrive at a reasoned (though not necessarily unbiased) attitude supported by information. In ELM, this is referred to as the central route to attitude change. Attitudes reached through the central route are postulated to be stronger and less susceptible to future change.

Alternatively, attitudes may also be changed through the peripheral route. When an individual is unmotivated or unable to assess the merits of the attitude object, an individual falls on the low end of the elaboration likelihood continuum. Information scrutiny is reduced, however, attitude change is may still occur through a number of less resource demanding or less effortful processes. ELM refers to this as the peripheral route and to many of these peripheral processes as cues. Examples of peripheral cues include an attractive source, affect associated with the attitude object, and the use of heuristics.

Attitudes changed through the peripheral route are considered to be shorter lived and weaker than those formed through the central route. ELM does not state that these routes are mutually exclusive. An individual might engage in both of these routes to persuasion simultaneously.

***Determinants of ELM.*** Petty and Cacioppo (1986) state that there are three ways in which a variable may affect attitude change: 1) serving as a persuasive argument, 2) serving as a peripheral cue, and/or 3) affecting the extent or direction of issue and argument elaboration. Before a discussion of the factors contributing to persuasion, it is useful to explain a central hypothesis of ELM: the multiple roles for variables hypothesis. The multiple roles hypothesis suggests that any variable can influence attitudes by different processes at different points along

the elaboration continuum (Petty & Cacioppo, 1986; Petty & Wegener, 1996). Consider this example from Petty and Wegener (1996):

Consider whether a manipulation of “beautiful scenery” in an advertisement for a vacation location should increase or decrease in impact as the elaboration likelihood is increased. If a person was not thinking about the ad very much (low elaboration likelihood), then the beautiful scenery might have a positive impact simply due to its mere association with the target location much as it might have a similar positive impact on evaluations of a new car that was located in the scenery (peripheral route). However, as the elaboration likelihood is increased and the scenery is processed for its merits with respect to the product, then the impact of the scenery on attitudes could be increased in the ad for the vacation location due to its perceived relevance and merit (or have the same impact but for a different reason), but show decreased impact in the ad for the car due to its perceived irrelevance for this product (central route). (p. 6)

As stated earlier, attitudes are formed by a large variety of causal pathways involving affect, cognition, and behaviour. A persuasive message may serve to change attitudes through any one of these proposed pathways. What ELM proposes is that the many variables that may change attitudes may operate differently along the elaboration continuum. Elaboration likelihood itself, may also be influenced by a number of variables.

Argument quality has been shown to have an impact on attitudes. Stronger arguments tend to be more persuasive than weak arguments especially under high elaboration conditions (Petty, Wells, & Brock, 1979).

*Motivation.* Motivation is a key component in ELM because it determines the extent to which one engages in central route processing. Several variables can affect motivation. Of particular importance is perceived personal relevance of the communication. When an individual perceives a message as being personally relevant to them they tend to be more motivated to process that message as well as being less susceptible to peripheral processes (Johnson & Eagly, 1989; Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo, & Schumann, 1983; Gockeritz *et al.*, 2010). Additionally, people are more motivated to engage in systematic/central route processing when they are solely responsible for message evaluation (Petty, Harkins, & Williams, 1980), when they have recently been deprived of control (Pittman, 1994), when they expect to discuss the issue with a partner (Chaiken, 1980), and when some incongruity needs to be resolved (Cacioppo & Petty, 1979) such as when an expert source presents surprisingly weak arguments (Maheshwaran & Chaiken, 1991). Additionally, humour presents an incongruence which has been shown to motivate individuals to process high-fear messages (Mukherjee & Dubé, 2012). Fear, particularly in low to moderate levels, has been shown to increase motivation to process (Rogers & Prentice-Dunn, 1997). Fear functions like perceived relevance; as fear increases, reducing the threat becomes a relevant goal to the individual which increases motivation to process and subsequently increases elaboration likelihood (Wood, 2000). Fear has been an important determinant of persuasion particularly in health persuasion research and is discussed in more detail below.

Some individuals possess a disposition towards cognitive activities and thus engage in more central route processing and are less susceptible to interference of peripheral processing. A scale measuring this disposition was developed by Cacioppo and Petty (1982) and named “need for cognition”. Individuals low in need for cognition (NFC) avoid effortful thinking unless the

situation (e.g. perceived relevance) demands it (Axson, Yates, & Chaiken, 1987). In contrast, people high in NFC will choose to engage in effortful central route processing more frequently. However, people high in NFC have been shown to be vulnerable to biased thought content (Petty *et al.*, 1993; Wegener, Petty, & Klein, 1994). Low-NFC individuals have been shown to be more greatly influenced by framing effects, particularly negative framing effects (Zhang & Buda, 1999). Ruiters, Verplanken, De Cremer and Kok (2004) found that low-NFC individuals were not motivated by fear appeals and their results suggest that fear appeals may only increase persuasion for high-NFC individuals.

*Ability to process.* Ability to process refers to the cognitive capabilities of the message recipient. Mukherjee and Dubé (2012) suggest that their findings indicate that humour messaging increases ability to process when combined with fear messaging. This study will test whether the use of visual metaphors will increase the ability to process of the participants.

### **Framing effects**

The literature on framing effects is reviewed here. This study used framing to manipulate the level of fear arousal in different groups of participants while communicating two equivalent messages. The principle of invariance states: the normative assumption that alternative descriptions of the same problem should lead to the same choice even in the case of limited or no reflection (Tversky & Kahneman, 1986). However, this is not the case. Take the example from Tversky and Kahneman (1986) of the survival frame versus the mortality frame:

Problem 5: (n=152) Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat



the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved [72%]

If Program B is adopted, there is a 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved [28%]. (p. 260)

The preceding two programs are presented in the survival frame where the outcomes are worded in positive terms (i.e. lives saved). In this case, the majority of people (72%) chose program A which had guaranteed benefits. The opposite, however, was true when the problem was presented in negative terms.

Problem 6 (N=155): If Program C is adopted 400 people will die. [22%]

If Program D is adopted there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die. [78%] (Tversky & Kahneman, 1986; p. 260).

People tend to be motivated by risk-taking when given the negative mortality framing and tend to be risk-averse when presented with the positive survival framing. These results have been replicated with medical professionals as well as environmental experts (McNeil, Pauker, Sox, & Tversky, 1982; Gregory, Lichtenstein, & Slovic, 1993).

**Effect of gain- versus loss- framing.** A message presented in a gain-frame would be worded in terms of the benefits that will result from engaging in a protective behaviour whereas loss-framed messages are worded in terms of the costs that may incur if that behaviour is not adopted. In addition to the aforementioned evidence on framing effects, gain- versus loss-framing has been shown to be an effective tool in several health belief persuasion studies (e.g.

Van't Riet & Ruiter, 2010) although overall, the results have been mixed and inconclusive (O'Keefe & Jensen, 2006; 2007; 2008; 2009; O'Keefe & Wu, 2012). As an explanation of these mixed results Rothman and Salovey (1997) draw on prospect theory (Tversky & Kahneman, 1992) to suggest that gain- and loss-framed information may increase persuasion depending on the type of behaviour the advocacy is targeting. Prospect theory predicts that people are risk-averse when they consider gains and risk-seeking when they consider losses. In the case of disease-detection, Rothman and Salovey (1997) predict that loss-framed information should be more persuasive for disease-detection behaviours since disease-detection resembles risk-seeking (finding the disease represents a risk). Additionally, gain-framed messages are predicted to be more persuasive for disease-prevention behaviours since disease-prevention resembles risk-averse behaviour (taking measures to prevent the risk). In the context of this study, wearing a life jacket resembles a disease prevention behaviour. The latter has subsequently been supported by a meta-analysis showing a small but significant effect size (O'Keefe & Jensen, 2007). An earlier meta-analysis showed no significant difference between gain- and loss- frames for diseases-detection behaviours (O'Keefe & Jensen, 2006).

Van't Riet and Ruiter (2010) suggest that part of the explanation for persuasive influence of framing effects is due to its relationship with affect. In one experiment, they found that gain-framed information induced higher levels of positive affect leading to more information acceptance and persuasion. While in a second experiment they found that loss-framed information led to increased negative affect and an association with higher intentions to perform physical exercise. Their research suggests that the underlying mechanism of gain- and loss-framing effects may be due to the separate influence of positive and negative affect respectively. Van't Riet and Ruiter (2010) write that their results imply "loss-framed information might be

more likely to have an effect on intention through negative affect, exerting a *motivating influence*” (p. 1271). These findings are consistent with the body of literature studying fear appeals. Fear appeals elicit a fearful emotional response which increases motivation to process the message and intention to engage in protective behaviour (Rogers, 1983).

Loss-frames and fear appeals have some conceptual similarities since each is postulated to have influence through negative affect. For this reason, we can expect that loss-frames will lead to more fear arousal and increase motivation. Although gain-framing will deliver an equivalent message it is expected to arouse less fear. A review of fear appeals follows this section.

### **Fear Appeals**

A fear appeal is a message with the intention of eliciting a fearful emotional and cognitive response which motivates an individual to find a way, through trial and error, to relieve their distress (Norman *et al.*, 2005; Rogers, 1975). The fear appeal often contains behavioural advice. If this behaviour is successful in relieving the individual from their unpleasant emotional state then it will be reinforced. The relationship between fear arousal and persuasion, although theorised to be an inverted U-shape has most often been shown to be positive and linear (Sutton, 1982; Witte & Allen, 2000; Latour & Rotfield, 1997; Rotfield, 1988; Strong & Dubas, 1993).

In contrast with past results, recent research has raised some doubts in the positive linear relationship between fear and behaviour. Gleicher and Petty (1992) found that if the recommended response was explicitly stated to be effective, participants would stop processing of the message. Keller and Block (1999) found that an individual’s prior behaviour was a significant factor in determining whether or not an individual would discount the message in a

fear appeal; more specifically, individuals who were not already performing the recommended response in the fear appeal were more likely to be persuaded by lower levels of fear. Subsequent research has suggested that the process underlying this result is defensive responses triggered by high fear arousal (e.g. Mukherjee & Dubé, 2012, Conway & Dubé, 2002).

Message processing has been shown to be disrupted by high levels of fear (Baron, Inman, Kao, & Logan, 1992; Jepson & Chaiken, 1990). A study on smokers (n=97) found that low-fear appeals were correlated with a decrease in problem elaboration and an increase in message elaboration (Keller & Block, 1996). However, the high-fear appeal was correlated with an increase in problem elaboration which Keller and Block (1996) suggest “increases the extent to which the recipient will engage in defensive tendencies such as message avoidance and thus reduce message elaboration” (p. 457).

This result is consistent with one study using PMT to explore maladaptive coping options; Rippetoe and Rogers (1987), in a study on breast cancer self-examination with 163 female students, found the emotion of fear to produce avoidant thinking. Additionally, several other PMT variables were linked with other maladaptive coping mechanisms: increased vulnerability with increased hopelessness, increased perception of severity with wishful thinking and perceived response ineffectiveness with fatalistic thinking (Rippetoe & Rogers, 1987).

Rossiter and Thornton (2004) found that anti-speeding “shock” ads, high-fear advertisements without any relief at the end of the ad, led respondents to drive faster in a simulated driving test. Mukherjee and Dubé (2012) argue that defensive responses lower the persuasiveness of a fear appeal. However, fear appeals have been successful in the past in cognition changes related to protection motivation. To answer the problem of defensive

responses, fear appeal researchers have turned to the use of humour, in combination with fear messaging, to provide relief and increase the effectiveness of fear appeals. This study proposes that another message variable, the use of a visual metaphor, may have the same effect.

**The problem with fear appeals.** The problem with fear appeals is that, in contrast with previous results which show a positive linear relationship between fear and persuasion, high fear arousal has been shown to result in tension and distress reducing the persuasiveness of the message (Keller & Block, 1996; 1999; Mukherjee & Dubé, 2012, Conway & Dubé, 2002). A search for possible answers to the problem of high fear arousal leads us to humour appeals. Conway and Dubé (2002) argue that humour, in combination with a threatening message, will be more persuasive for high-masculinity individuals because the humour appeal matches the distress schema of those individuals.

According to theories on the processing of humour, first, humour presents incongruity, that being, a series of events that do not normally occur together. The incongruence is resolved by a problem solving process, in a playful, diminutive or non-serious manner generating a humour response (Wyer & Collins, 1992; Alden, Mukherjee, & Hoyer, 2000).

Mukherjee and Dubé (2012) hypothesized that humour appeals act by creating a safe context in which the need for defensive responses are not needed. The results of their studies showed that increasing fear tension arousal increased persuasion in the presence of humour but decreased persuasion when humour was absent. Fear-reduction was not significantly associated with humour which led the researchers to propose the following relationship: “At the broadest level, our results indicate that fear increases motivation to process, while humor increases ability to process the message in the ad” (p. 154).

## Metaphor Comprehension

The previous section suggested the profound influence that humour might have in terms of persuasive communication. It suggested that humour can increase the efficacy of fear appeals. However, there are instances in which humour may be considered as inappropriate. When dealing with water safety, for example, fear appeals often focus on danger and even death. Death may be considered an inappropriate topic for humour. Consequently, water safety messages may need to rely on other, equally effective but less (possibly) offensive approaches. One such approach is the use of a metaphorical device.

Lakoff and Johnson (1980) offer the most often cited definition of a metaphor: “understanding or perceiving of one kind of things in terms of another kind of things” (p. 5). The majority of research has looked at metaphors as a literary comparison in the form of “A is B”. However, Forceville (2008) offers a definition of metaphors which encompasses metaphors presented in other modalities as well:

(1) Metaphor involves no less and no more than two domains; (2) One of the domains pertains to the topic about which something is predicated (in line with cognitive linguistics practice here called the “target”), while the other domain pertains to the predication (the “source”). Target and source are, in principle, irreversible; (3) A metaphor is not necessarily verbal in nature. (p. 2-3)

For example, in the metaphor “this party is a riot”, the *party* would be the target and *riot* would be the source (or base domain as some other scholars have referred to it). Three theories of metaphor comprehension have been proposed:

**Literal-primacy theory.** In the *literal-primacy* theory (Beardsley, 1962, 1976; MacCormac, 1985) metaphors are processed in three steps: 1) derive the literal meaning of a metaphor, 2) test whether the literal meaning makes sense and detect an anomaly for a violation of semantic rules, and 3) seek an alternative meaning when the literal meaning fails to make sense. MacCormac (1985) tells us that the perception of error creates cognitive tension and a desire to reduce it. When the anomaly is resolved by deriving the non-literal interpretation of the metaphor, the interpreter resolves the tension and experiences pleasure.

Alternatively, the next two theories see metaphors as not necessarily being literally false but occupying a space on a literacy-metaphoricity spectrum. These views presume that both literal and metaphorical language can be resolved through the same processes.

**Salience-imbalance theory.** The *salience-imbalance* theory written by Ortony (1979) suggests that a metaphor is understood by the interpreter constructing a mental list of shared attributes between the target and source domains. The interpreter then selects attributes that have low salience for the target domain and those which have high salience for the source domain. Sopory & Dillard (2002) in their review of metaphors and persuasion give this example: “‘Encyclopaedias are goldmines’ is understood by identifying attributes such as ‘valuable nuggets’ and ‘dig,’ which have a high salience for ‘goldmines’ and a low salience for ‘encyclopaedias’” (p. 384).

**Structure-mapping.** Lastly, Gentner (1982, 1983, 1989) applies *structure-mapping* to metaphors comprehension. As opposed to attributes stated in the last theory, metaphors communicate two related systems of connected facts. In resolving the incongruity, interpreters search for the maximum structural match between target and source domains. The example

stated above would then be interpreted as “valuable nuggets found by digging” as opposed to the attributes ‘valuable nuggets’ and ‘dig.’

These theories are not mutually exclusive and research has attempted unsuccessfully to favour one theory over another (Sopory & Dillard, 2002).

### **Metaphors and Persuasion**

There are several proposed explanations for the documented positive influence of metaphorical devices on persuasion. Metaphors have been theorised to have an influence on persuasion through cognitive, affective, and motivational processes.

As mentioned above, the perception of error when faced with a novel metaphor is theorised to create negative cognitive tension (Sopory & Dillard, 2002; Bowers & Osborn, 1966). The resolution of the incongruent frames relieves this negative tension but also creates pleasure associated with solving the riddle which the metaphor presents (Phillips, 1997). The solution of the riddle can also build rapport between the communicator and the viewer (Norrick, 2003). However, others suggest that it is merely relief that is experienced from the negative tension dissipating. The reward of pleasure or relief leads to misattribution where the positive affect is attributed to the brand or product being advertised rather than the result of problem-solving (Berlyne, 1974; Eisend, 2011).

Metaphors have also been predicted to increase source credibility although support for this hypothesis is lacking (Sopory & Dillard, 2002). The reason is that the creativity and presentation of a novel metaphor is expected to impress interpreters who in return, judge them favourably. Metaphors have not been shown to have an influence on judgements of source



credibility itself (Sopory & Dillard, 2002). However, when source credibility is low, metaphors are more persuasive than when source credibility is perceived as high.

Since metaphors are more complex than their literary counterparts, researchers have theorized that metaphors may consume more cognitive resources and lead to reduced counter arguing. A reduction in counter arguing has been shown to influence persuasion (Petty & Wegener, 1991). Additionally, this added complexity has been proposed to increase message elaboration and consequently persuasion (Sopory & Dillard, 2002; Petty & Cacioppo, 1986; Cacioppo & Petty, 1979).

Theories of humour comprehension share many similarities with the *literacy-primacy* theory of metaphor comprehension. Both present incongruent frames which prompt the interpreter to resolve the frames using a problem-solving process. Incongruity in advertising has been shown to increase message elaboration (Heckler & Childers, 1992). Both lead to positive affect: in the case of humour, a humorous response is generated by resolving frames, where in the case of a metaphor, there is relief and/or pleasure that results from the dissipation of cognitive tension.

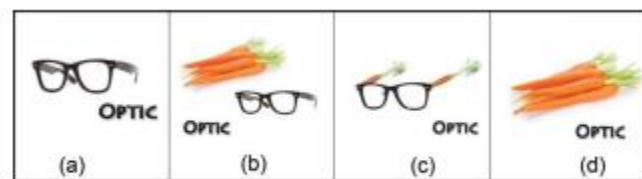
## **Visual Metaphors**

Advertisers often rely on visual metaphors to communicate messages about their brands and products (Boozer *et al.*, 1991). Visual metaphors are similar to verbal metaphors, however, instead of verbally stating that two objects or concepts are linked analogically, there is an artful representation of these objects. For example, Heinz has used an advertisement depicting a bottle of ketchup which has been shown to be sliced as if it were a tomato. Visual metaphors allow

advertisers to communicate that their product or brand has a certain set of attributes without explicitly stating it. Following the prior example, the Heinz ketchup ad wants you to attribute the freshness of tomatoes with their ketchup.

An image can function as argument: advancing a position even in the absence of verbal anchoring. Images can even be more persuasive than verbal arguments (Bulmer & Buchana-Oliver, 2006). One factor that makes visual metaphors more persuasive is that they lead to more message elaboration than literal messages (Toncar & Munch, 2001). Ad messages presented through images often lead to multiple interpretations by indirectly and implicitly making claims rather than doing so explicitly as in verbal arguments (McQuarrie & Phillips, 2005; Marchand, 1985). The complexity and indirect claims of pictures lead the audience to spend more time and effort processing the message (McQuarrie & Mick, 1999; Jeong, 2008; McQuarrie & Phillips, 2005; van Mulken *et al.*, 2014). Visual metaphors have been shown to be more persuasive than literal and verbal messages (McQuarrie & Phillips, 2005; Jeong, 2008).

Forceville (2008) offers a typology of visual metaphors: they may be juxtaposed (simile), fused (hybrid), or one object may even be absent and represented in another implicit way (replacement or contextual).



Visual metaphors for spectacles: (a) no metaphor, (b) juxtaposition, (c) fusion, and (d) replacement.

Figure 3. Typology of visual metaphors (van Mulken *et al.*, 2014)

The visual metaphors in figure 3 are presented in order of increasing complexity. Van Mulken *et al.* (2014) found evidence for an inverted U-shape relationship between complexity of the metaphor and appreciation. Fusion metaphors were found to be the most appreciated metaphors while replacement metaphors led to lower comprehension and lower appreciation.

Pictures are often considered to be heuristic cues, however, in the case of visual metaphors the added complexity demands message elaboration. This message elaboration is needed to process and solve the incongruity. Due to the complexity, need for cognition has been shown to moderate the motivation of viewers of visual metaphors (Chang & Yen, 2013). Those high in need for cognition have also been shown to appreciate metaphors more (Lagerwerf & Meijers, 2008).

## **Protection Motivation Theory**

**Origin and history of the protection motivation theory.** Protection Motivation Theory was originally developed by Rogers (1975) as an application of the fear-drive model to the problem of understanding health attitudes and behaviours. The fear-drive model predicts that after receiving a communication evoking fear, the emotion of fear acts as a motivator of trial and error behaviour. If the communication contains behavioural advice, following this advice is one way of trying to reduce the unpleasant fearful state the person is in. If that behaviour is successful in reducing fear then the behavioural response will be reinforced.

Rogers' (1975) original conception of PMT was based on the work of Hovland *et al.* (1953) who proposed that each fear appeal communication had three main stimulus variables: the magnitude of noxiousness or severity of an event, the probability of the event occurrence if no protective behaviour is adopted or existing behaviour modified, and the efficacy of a

recommended coping response to reduce or eliminate the noxious event. In an effort to bridge the gap between fear appeals and research on attitude change, Rogers (1975) hypothesized that each of the above three variables had an associated mediating cognitive process: perceptions of severity, perception of vulnerability and perception of response efficacy. These three processes influence protection motivation: the outcome variable of the original PMT and synonymous with the intention to carry out the recommended response.

Rogers (1983) revised PMT to include additional sources of information other than simply fear appeals: observational learning, past experience and personality were now all PMT stimulus variables. In addition, several cognitive mediating processes were added: rewards of the maladaptive response, self-efficacy, and response costs. Rogers then organized each of these along two independent cognitive processes: threat appraisal and coping appraisal.

Some PMT researchers have used PMT in a similar formulation where the cognitive processes of threat appraisal and coping appraisal happen simultaneously; others suggest that threat appraisal must occur prior to coping appraisal. Their argument follows: in order for one to make an analysis of the coping options, one first must be aware of a threat, that threat must evoke fear which causes the individual to seek a behaviour which reduces that fear (Tanner, Hunt, & Eppright, 1991).

**Structure of current PMT model.** PMT categorizes cognitive strategies for reducing fear into two types: maladaptive behaviour, such as avoidance and denial, and adaptive behaviour, the recommended protective behaviour. The current PMT is organized into two cognitive processes which assess the cost-benefit of performing the adaptive and maladaptive response behaviours respectively. The threat appraisal process is an assessment of the

maladaptive response including three main variables: intrinsic and extrinsic rewards of adopting the maladaptive response, perceived severity, and perceived vulnerability.

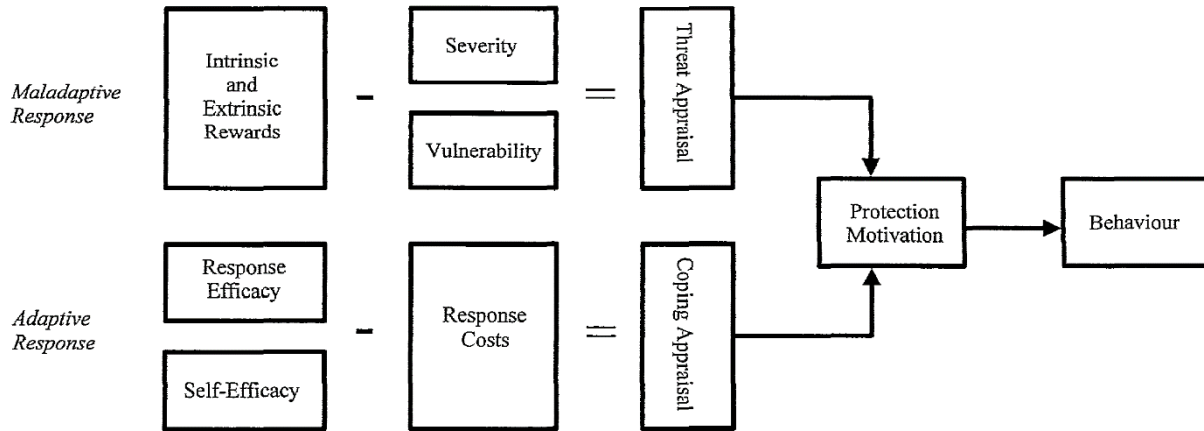


Figure 4: Protection Motivation theory (Norman *et al.*, 2005)

*Intrinsic and extrinsic rewards* are positively associated with a maladaptive response and negatively associated with protection motivation. For example, a recommended safe sex practice is wearing a condom, however, a reward of performing the opposing maladaptive response might be perceived increased sexual pleasure. Similarly, a recommended water safety practice is wearing a life jacket when boating, and a potential reward of neglecting to wear the life jacket might be preferred tan lines or comfort. *Perceived severity* assesses how serious an individual believes the threat would be to his or her own life. This study asks participants about the seriousness of the consequences should they find themselves to be in open water without a life jacket. *Perceived Vulnerability* measures how personally susceptible an individual feels they are to a threat, or in some cases, what they believe the likelihood is that a threatening event will take place to them. In this study, participants are asked about the likelihood of negative consequences should they choose not to wear a life jacket during a canoe trip. *Fear*, although associated with

threat, is not a part of the maladaptive response evaluation, but rather, acts as an intervening variable between threat appraisal and protection motivation.

The second cognitive process, coping appraisal, is an evaluation of adopting the adaptive response or the recommended protective behaviour. This pathway also includes three main variables: response cost, response efficacy, and self-efficacy. *Response costs* are the situational factors which are negatively associated with performing and/or adopting the recommended adaptive response. For example, in the context of this study, a response cost would be the social disapproval or the physical discomfort associated with wearing a life jacket.

There is some conceptual similarity between *response costs* and *intrinsic/extrinsic rewards*. As Abraham, Sheeran, Abrams, & Spears (1994) correctly identifies, there is little difference between the cost of performing a preventative behaviour and the reward of not performing one. For example, if we take the situation of wearing a life jacket: “getting unwanted tan lines” may be phrased as a response cost of wearing the life jacket, however, it could also be phrased in a redundant way to be an extrinsic reward, that is “tanning evenly”. It may be the case that one way of phrasing “tan lines” resonates more strongly than another with the study group, but nonetheless, both intend to measure the same concept. Many studies have chosen to study *response costs* while neglecting to use *intrinsic/extrinsic rewards*.

*Response efficacy* is how strongly the individual believes that the recommended adaptive response will be effective in preventing the threat. If the individual believes that wearing a life jacket is likely to prevent them from drowning then, using PMT, we would expect this belief to be positively associated with intentions to wear a life jacket. *Self-efficacy* concerns the

individual's beliefs that they possess the ability to perform the recommended response when required.

Finally, the outcome variable of PMT is protection motivation which is synonymous with intention to perform recommended adaptive behaviour. It is expected that the intention to perform the adaptive behaviour will be positively associated with *severity*, *vulnerability*, *fear*, *response efficacy*, and *self efficacy* and negatively associated with *response costs* and *intrinsic/extrinsic rewards*.

The PMT has been applied to a wide variety of health issues including quitting or refraining from smoking cigarettes (e.g. Thrul, Stemler, Buhler, & Kuntsche, 2013), exercise intentions (e.g. Plotnikoff & Trinh, 2010; Fruin, Pratt, & Owen., 1992), safe sex practices (e.g. Bengel, Belz-Mark, & Farin, 1993), dental hygiene and flossing (e.g. Beck & Lund, 1981), preventing hearing loss at the workplace (e.g. Melamed & Rabinowitz, 1996), safe consumption of alcohol (e.g. Ben-Ahron, White, & Phillips, 1995), cancer self-examination (e.g. Rippetoe & Rogers, 1987) and general health protection (e.g. Stanley & Maddux, 1986). In addition, PMT can and has been used to explain a variety of other situations which involve a personal threat and protective behaviour options. PMT has been used to study personal safety such as water safety (McCool *et al.*, 2009) and speeding while driving (e.g. Glendon & Walker, 2013), and a number of other threats related to organic food choices (Scarpa & Thiene, 2011), adoption of information systems security policy (Ifinedo, 2012), adoption of anti-plagiarism software (Lee, 2011), and prediction of pro-environmental behaviours (Kim, Jeong, & Hwang, 2012).

A variety of methods have been used in combination with PMT including correlational: both cross-sectional (e.g. Bengel *et al.*, 1996), and longitudinal (e.g. Plotnikoff & Trinh, 2010;

Tulloch *et al.*, 2009), and experimental (e.g. Beck & Lund, 1981; Glendon & Walker, 2013). The focus of researchers on using PMT in experimental settings has been praised as an advantage over competing theories such as the theory of planned behaviour and the health belief model (Milne *et al.*, 2000).

**PMT variables.** Two independent meta-analyses (Floyd *et al.*, 2000; Milne *et al.*, 2000) of PMT variables have been performed to date. A meta-analysis is an effective way of measuring the success of a model's predictive ability. The Floyd *et al.* (2000) study chose not to study the role of *fear* and the Milne *et al.* (2000) study chose not to analyse *rewards*. The Milne *et al.* (2000) study used much stricter requirements (n=21) than the Floyd *et al.* (2000) study (n=65) and as a result, only one PMT study (Abraham *et al.*, 1994) used the *rewards* construct. It was not mentioned why Floyd *et al.* (2000) chose not to report effect sizes for *fear*. In both studies, the effect sizes for all PMT variables were found to be significantly correlated with intentions and in the predicted direction.

Coping appraisal variables had the strongest association with intentions, outperforming threat appraisal variables. In the Milne *et al.* (2000) meta-analysis, all three coping appraisal variables (i.e. response costs, response efficacy, self-efficacy) had medium effect sizes. In the Floyd *et al.* (2000) meta-analysis, prior to homogeneity correction, coping appraisal variables had mean effect sizes which ranged from .52 to .88, where threat appraisal variables ranged from .39 to .41. It is worth noting that Floyd *et al.* (2000) chose to incorporate experimental and cross-sectional studies into the same analysis where Milne *et al.* (2000) treated them separately.

Although, coping appraisal variables had stronger associations with intention than threat appraisal, all variables were found to be significant. There was one area in which threat appraisal



variables outperformed coping appraisal variables: experimental manipulation studies. Milne *et al.* (2000) found that in experimental manipulation studies *severity* and *vulnerability* had large effect sizes with attitude change (.66\*\*\* and .63\*\*\* respectively) while *fear* (.26\*\*), *self-efficacy* (.32\*\*\*), and *response efficacy* (.42\*\*\*) had medium effect sizes. It is interesting to note that those PMT variables which were most strongly correlated with intentions also proved to be the most difficult to change in experimental manipulations.

**Severity.** Although *severity* showed significant effect sizes in both meta-analyses it was relatively one of the poorer predictors of intentions. Milne *et al.* (2000) chose to analyse only health related studies and the vast majority of studies in the Floyd *et al.* (2000) study were health related as well.

In some studies, there was very little variation in *severity*. In a study on adolescents' smoking behaviour, participants reported relatively high values in both *severity* and *vulnerability* (Thrul *et al.*, 2013). In a study on HIV-preventative behaviour and condom use, *severity* predicted sexual behaviour, condom-use, number of sexual partners, and behaviour change only for certain subgroups (Bengel *et al.*, 1995). 95% of subjects agreed with the statement that AIDS represents a major risk and a threat to human health. Bengel *et al.* (1995) concludes that although *severity* was not predictive, perceptions of threat were sufficiently aroused for protection motivation. These results may be due to the success of large awareness campaign on AIDS and lung cancer. Surely, few would disagree now that AIDS and/or lung cancer is severe and a threat to one's wellbeing.

The effect of large scale interventions has not been observed in a water safety study. In a study on the safe swimming behaviour of New Zealand's beachgoers, McCool *et al.* (2009)

found a significant association ( $p < 0.001$ ) between reported safe swimming behaviour and *severity*: the strongest association in the study.

***Vulnerability.*** There are a number of reasons that contribute to the difficulty in assessing perception of personal *vulnerability*, some of which may contribute to the relatively low effect size of *vulnerability*. For example, the affect heuristic can bias probability estimates in a number of ways such as an increased perception of likelihood attributed to low benefit hazards and a decreased perception of likelihood attributed to high benefit hazards (Slovic & Finucane, 2004). Additionally, respondents may take into account an unspecified array of factors when trying to personalize their vulnerability to a certain risk. Floyd *et al.* (2000) makes note that PMT does not assume that respondents are rational: they write “people often inadvertently change the meaning of information and fail to consider all of the possible interpretations.” (p. 420). This has led Van der Velde *et al.* (1996) to call for conditional measures of *vulnerability* in PMT studies.

In some cases, *vulnerability* has had a negative relationship with intentions, specifically in cases where *response efficacy* was perceived to be low or ineffectual (Rogers & Mewborn, 1976; Maddux & Rogers, 1983). Weinstein and Nicolich (1993) argue that people may use their current behaviour as a way to judge their vulnerability. When asked about their *vulnerability*, those currently adopting the protective behaviour may report a lower *vulnerability*: they feel less vulnerable due to their protective behaviour leading to the negative relationship. However, the meta-analysis by Milne *et al.* (2000) presents evidence to the contrary; although, only a weak correlation exists between *vulnerability* and concurrent behaviour, it is significant and in the predicted positive direction ( $r^+ = .13^{***}$ ). Weinstein and Nicolich (1993) extend their argument to intentions as well. It may be the case that intentions to protect oneself has a direct effect on lowering perceptions of vulnerability. The meta-analysis by Milne *et al.* (2000), once again,

provides evidence suggesting the opposite is true; a weak positive correlation exists between *vulnerability* and *intentions* as well.

As an answer to Weinstein and Nicolich's (1993) criticism, conditional measures, reduce the factors a respondent may consider when assessing their vulnerability. Conditional measures specifically ask respondents about their perceptions of personal vulnerability if they do not perform the recommended safety behaviour. Van der Velde *et al.* (1996) found that, although there was no statistically significant difference between conditional and unconditional measures of vulnerability, *conditional vulnerability* appeared to be the more stable variable. In an AIDS-related risk behaviour study on STD clinic attendees, they found the association between *unconditional vulnerability* and *intentions* was dependent on their type of sexual partner (i.e. private vs. prostitute). The *conditional vulnerability* was associated regardless of sexual partner.

## **Conclusion**

In closing, the literature shows in sum that 1) people who hold beliefs that a threat is low or coping responses ineffective are more likely to engage in dangerous maladaptive behaviour, 2) peoples' perceptions can be altered by using fear advertising, 3) however, too much fear may lead to defensive responses, 4) fear when combined with humour mitigates the effect of these defensive responses, and 5) metaphors and humour share many similarities in the way they are processed and comprehended. This leads to the question of whether metaphorical devices offer persuasive benefits to fear appeals and lead to a similar interactive effect to that of humour and fear.

### Chapter 3 – Methods

The processes which lie behind people's risk assessments are complex and may not necessarily be rationally driven. The literature review in chapter 2 suggests that people often make biased decisions when confronted with a risk-based decision.

To understand the processes of persuasion and attitude change this study draws from the Elaboration Likelihood model (ELM). Chapter 2 outlines the significant factors which ELM brings to studies on persuasion (i.e. message elaboration, need for cognition, etc.). To understand people's risk assessments this study used the Protection Motivation theory as a framework (Rogers, 1983). One way to present a risk communication message is with a fear appeal. A fear appeal is a message which evokes fear and also contains some behavioural advice on how to reduce or eliminate the fear. The recipient is motivated by fear into trial and error behaviour in an attempt to remove this unpleasant emotional state. If the recommended response is successful in reducing the fear, then the behaviour will be reinforced. Fear has been shown to be positively associated with persuasion (Milne *et al.*, 2002; Floyd *et al.*, 2000). However, high levels of fear arousal can lead to defensive responses (Mukherjee & Dubé, 2012; Conway & Dubé, 2000; Rippetoe & Rogers, 1987). To mitigate these defensive responses, researchers have turned to humour messaging in combination with fear as a way of reducing the need for defensive responses. A review of the literature has shown that the psychological processing of humour shares many similarities with the processing of metaphors. This study compares messages which feature a visual metaphor versus a literal counterpart.

The threat of drowning from failure to wear a life jacket was chosen as the context in which to explore the effects of using a visual metaphor in a fear appeal. The researchers had

access to students at the University of Waterloo. The typical age of ungraduated students was of particular interest for this study since, according to the Lifesaving Society's *Drowning Report*, "the risk-taking 18-24-year-olds continue to have the highest water-related death rate of any age group in Canada at 2.2 per 100,000 population" (The Lifesaving Society, 2014). The sample had an average age of 20.14 and a range of 18 to 26 years olds. The factors which affect this assessment are of interest in this study since, as the literature review has shown, people often make biased decisions when it comes to risk. Of further interest is the interaction between a visual metaphor and fear arousal. Several studies have shown the benefits of mixing humour and fear in messages promoting protective behaviour (e.g. Conway & Dubé, 2002; Voss, 2009). Humour has been shown to interact with high fear arousal: decreasing defensive responses and increasing message elaboration and persuasion (Mukherjee & Dubé, 2012). Metaphors are processed in a very similar way to humour. Both involve frames which present an incongruity to the interpreter who must then resolve the apparently conflicting frames in a problem-solving manner. The result of this process is pleasure, although the pleasure derived from humour and that from solving a metaphor are qualitatively different. What is unknown is whether metaphors in a fear appeal will yield the same benefits as humour. This study tested the influence of visual metaphors on persuasion in fear appeals.

### **Simulation Methodology and Experimental Design**

The literature review showed that fear is often positively associated with persuasion. However, fear arousal can lead to defensive responses, specifically decreased message elaboration, which interfere with the receptivity of a fear appeal. Humour messaging when combined with a fear appeal reduces the need for defensive responses and increases message elaboration. The hypotheses for this study predict that visual metaphors will have similar effects.

Metaphors have been shown to have a positive influence on persuasion and message elaboration (Jeong, 2008). This study used an experimental design in which participants received one of four treatment messages or a control message. The treatment messages vary fear, through the use of loss- and gain- framing, while using either a visual metaphor or a literal image. The treatment messages are as follows: a high-fear appeal with a visual metaphor, a moderate-fear appeal with a visual metaphor, a literal high-fear appeal, and a literal moderate-fear appeal. The responses of participants' beliefs about personal severity, vulnerability, self-efficacy, response efficacy, and response costs were monitored. Persuasion was measured by using intentions to wear a life jacket. Message elaboration and need for cognition were measured since they have been shown to be important factors in many persuasion studies. These appeals were administered in the form of a poster advertisement. Participants were randomly assigned to one of the treatment groups.

### **Sampling**

Participants were sampled from two undergraduate courses offered at the University of Waterloo: a third year recreation and leisure studies class (n=34) and a second year statistics class (n=142). The age of the students ranged from 18 to 26 years old. Courses were sampled using convenience sampling.

It was not an objective of this study to achieve a representative sample of any particular population. However, there are advantages to having a homogenous sample such as students. For example, a homogenous sample can be used as a control (Creswell, 2009). As mentioned above, the age group of students is of particular interest in this study due to their high risk of drowning.

The survey booklets were distributed to undergraduate students during lectures at the University of Waterloo. Participants were informed that participation is voluntary and they may

end their participation at any time. Participants were also informed that this study is not associated with the class they are in. No remuneration of any kind was provided in return for participation. Participants were shown a letter on a PowerPoint slide after completion of the survey, which repeats the above information, as well as listing the contact information for the faculty supervisor and researcher. Participants were instructed to contact the faculty supervisor if they have any questions about the study, the survey, or the results. Completed surveys were placed in a box and transported to the researcher's home for data analysis. At the completion of the analysis, the surveys will be stored in a locked filing cabinet, in a secure location, at the University of Waterloo. These surveys will be retained for 5 years and then destroyed.

### **Survey Instrument**

The survey instrument is composed of several sections. The survey is designed to provide the researcher with information about the respondents' intentions to wear a life jacket while boating, their beliefs which are theorised to be related to the formation of these intentions, and their history and experience with boating. The survey instrument can be found in appendix F.

Each of the survey booklets contained only one of the control/treatment messages. Prior to distributing the surveys, each treatment message was assigned an arbitrary numeric value (see figure 5). The control message is assigned the number 5.

	<b>Visual Metaphor</b>	<b>Literal</b>
<b>Moderate fear</b>	1 (Appendix A)	2 (Appendix B)
<b>High fear</b>	3 (Appendix C)	4 (Appendix D)

Figure 5 – Arbitrary numeric values assigned to the four treatment posters

The questionnaires were sorted using a list of 500 random numbers between 1 and 5 generated in Microsoft Office Excel. Nothing that could be used to identify the treatment message was put on the front or back cover of the survey booklets.

The survey instrument first asks respondents about their history and experience with boating. Respondents were then presented on the next page with the same scenario statement and one of the five control/treatment posters. The scenario statement was designed to create a common context for participants. The threat of drowning may be present in any number of situations which may necessitate the consideration of several coping options. This study was interested in students' beliefs about drowning when they consider going on a canoe trip.

**Treatment messages: life jacket poster.** The control message (see appendix E) features the bottom half of the original poster (see appendix A) which was obtained from the Lifesaving Society. This control message features a background image of a lake and some forested land as well as a response message at the bottom of the poster directing viewers to use a website where more information on light-weight pull-cord life jackets can be found. Also, the logos of two agencies which have advocated for this message (Lifesaving Society and Safeboater.ca) are provided at the bottom of the poster. The website, [smartboater.ca](http://smartboater.ca), was created by the Canadian Safe Boating Council as a resource website for recreational boaters. The home page has a link which takes you to a page featuring a video explaining how pull-cord life jackets work and some of their advantages over traditional life jackets.

**Hypothesis 1.** The first hypothesis states: “Messages referring to consequences (in this case lives lost or saved due to wearing life jackets) will generate a greater fear response than will a neutral message (referring readers to a website).”



To test this hypothesis, at the top of each of the treatment posters is a fear message. This fear appeal should create a greater intention to wear a life jacket than will the control (neutral) message. Fear scores were collected using a seven point scale popularized by Keller and Block (1996). This scale asks respondents about the degree to which the treatment message makes them feel very unafraid/afraid, relaxed/tense, calm/agitated, and restless/excited. This scale has been used in other research (e.g. Mukherjee & Dubé, 2012; LaTour & Rotfield, 1997) on fear and has a high internal consistency ( $\alpha = 0.85$ ). Fear arousal is the fear that is aroused from viewing the treatment. The mean fear scores will be compared across groups using ANOVA.

**Hypothesis 2.** The second hypothesis states: “Messages referring to negative consequences (in this case death due to drowning) will generate a greater fear response than will messages referring to lives saved.”

To test this hypothesis treatment messages varied fear using gain- and loss-framing. Framing has been shown to have a differential influence on fear. Loss-framing has been associated with increased fear in other studies (Karpinsky, 2014; Rothman and Salovey, 1997; O’Keefe and Jensen, 2009). The base poster, designed for moderate fear arousal, has a gain-framed message near the top of the poster which reads “100 lives could be saved each year simply by wearing a life jacket.” The high-fear poster has an equivalent message presented in a loss frame which reads “100 people die each year by neglecting to wear a life jacket” (see appendices A to D). The mean fear scores will be compared between the negative and positive groups using T tests.

**Hypotheses 3a & 3b.** Hypothesis 3a states “Messages intended to create moderate levels of fear will be more persuasive than will neutral messages (in terms of intentions to wear a life

jacket).” Hypothesis 3b states: “Messages intended to create moderate levels of fear will be more persuasive than will high fear messages (in terms of intentions to wear a life jacket).”

Persuasion was measured by monitoring participants’ intentions to wear a life jacket. This is consistent with previous studies on persuasion and fear (e.g. Mukherjee & Dubé, 2012; Keller & Block, 1996). Intentions were measured by adapting a standardized scale designed by Plotnikoff & Higginbotham (1998, 2002) for intentions to exercise. The scale is a four item, five-point scale (low intention = 1; high intention = 5). One item from the scale is not used in the survey. This item is “How often do you tell yourself to get adequate exercise?” This item had the lowest factor loading (0.53) in previous work. This item was not used in the present study because wearing a life jacket is a behaviour which is recommended to be performed when faced with the threat of drowning, as opposed to exercise, which can be performed at any time. The other items were adapted by replacing references to getting adequate exercise with wearing a life jacket. After adapting the items, two of the items were worded very similarly. Between these two, the item with the lower factor loading was dropped. Additionally, the original scale asked respondents to consider their intentions for the time period of the next six months. This was adapted to reduce the context to the hypothetical canoe trip from the scenario text. For example, item 2 was adapted to read “How likely or unlikely is it that you will wear a life jacket when you’re in the canoe?” This scale was found to have high internal consistency ( $\alpha=0.83$ ).

The mean intention scores will be compared across groups using ANOVA.

**Hypothesis 4.** Recall from chapter one that the fourth hypothesis states: “Under high fear conditions, a message using a metaphorical image will be more persuasive than one using a literal image (in terms of intentions to wear a life jacket).”

To test this hypothesis the middle of the poster features an image. These posters were altered to either have the metaphor image from the base poster or a literal image (see appendices A to D). This metaphor image is a fire alarm which has a pull-cord added to it and the words “pull in case of drowning” on the handle of the fire alarm. The life jacket is the target domain and the fire alarm is the source domain. They share the relational structure of being “objects you pull in an emergency”. According to Forceville’s (2008) typology of visual metaphors, the fire alarm image would be a replacement metaphor. In a replacement metaphor only one of the domains is present: in this case, the fire alarm is present and the life jacket is not present. The life jacket is implied to be the target domain by the context which includes the two messages above and below the image. The literal image was of a light-weight pull-cord life jacket mentioned in the message at the bottom of the poster. The mean intention (to wear a life jacket) scores will be compared between the metaphorical image and the literal image treatment groups using T-test.

The survey instrument then asks a series of questions pertaining to the research question and finally ends by asking for some background information to be analysed for demographics. The entire survey instrument can be found in Appendix F.

## **Other Variables**

**Protection Motivation Theory.** Protection motivation theory (PMT) was used because it is the most prominent theory on the relationship between fear and behaviour in the field. PMT predicts that people’s intentions to perform a protective behaviour are a function of two appraisal processes: threat appraisal and coping appraisal. PMT predicts that when threat is appraised to be high and coping options evaluated as effective then individuals will be motivated to perform the protective response. However, if threat is appraised to be high and coping responses evaluated as

ineffective then PMT predicts that people will engage in a number of maladaptive or defensive responses, designed to reduce the unpleasant state of fear while unfortunately not offering any protection. PMT variables are measured using scales adapted from Plotnikoff and Higginbotham (1998; 2002). All protection motivation variables will be measured with the exception of rewards. This is consistent with other protection motivation studies (see Norman *et al.*, 2005).

There is some conceptual similarity between *response costs* and *intrinsic/extrinsic rewards*. Consequently, data concerning rewards was not collected in this study. As Abraham *et al.* (1994) correctly identifies, there is little difference between the cost of performing a preventative behaviour and the reward of not performing one. For example, if we take the situation of wearing a life jacket: “getting unwanted tan lines” may be phrased as a response cost of wearing the life jacket, however, it could also be phrased in a redundant way to be an extrinsic reward, that is “tanning evenly”. It may be the case that one way of phrasing “tan lines” resonates more strongly than another with the study group, but nonetheless, both intend to measure the same concept. Many studies have chosen to study *response costs* while neglecting to use *intrinsic/extrinsic rewards* (see Milne *et al.*, 2002; Floyd *et al.*, 2000; Norman *et al.*, 2005). For the purpose of not having conceptually similar constructs, rewards was omitted.

***Threat appraisal.*** There are two threat appraisal variables: perceived severity and perceived vulnerability. Perceived severity was measured with a single-item scale. Perceived severity is often measured with a single-item and many studies which have used multi-item scales have had poor internal consistency (Norman *et al.*, 2005). Severity was measured by asking participants: “how serious would it be if you fell out of the canoe without a life jacket on the canoe trip?”

Vulnerability was measured using a single-item measure: “How likely is it that you may fall into the water and drown if you choose not to wear a life jacket during the canoe trip?” Many studies have used single-item measures for vulnerability (e.g. Plotnikoff & Trinh, 2010). Van der Velde *et al.* (1996) found that people may take into account an unspecified array of factors when considering their vulnerability to a threat. They suggest that conditional measures be used to limit participants to considering their vulnerability given that they do not perform the protective action. This study uses a conditional measure of vulnerability and also asks participants to consider a specific situation when answering the questions to reduce the external factors that participants may consider.

***Coping appraisal.*** All three PMT coping appraisal variables were measured using the instrument. Multi-item scales were adapted from Plotnikoff and Higginbotham (2002) to measure response efficacy and self-efficacy. A response costs scale was adapted from Milne *et al.* (2002).

Self-efficacy was measured using five-items which focused on the ability of the participants to put on and wear a life jacket when necessary. Participants were asked to rate the level to which they could perform the given task on a five point likert scale from “I know I cannot” to “I know I can.” An example of an item in this scale is “Put on a life jacket while in a boat.”

Response efficacy was measured using three-items focusing on the extent to which a wearing a life jacket will prevent death. Participants were asked to rate their agreement with the item statement on a five-point likert scale from “definitely not” (1) to “definitely yes” (2). An

example of a response efficacy item is “If I fell in the water during the trip, wearing a life jacket will lower my chances of dying.”

Response costs were measured by adapting a scale from Milne *et al.* (2002). Response costs was measured using 3-items where participants were asked to rate their agreement on a five-point likert scale from “strongly disagree” (1) to “strongly agree” (5). An example of an item in the response costs scale is “The benefits of wear a life jacket while boating outweigh the costs.”

**Message elaboration.** Message elaboration was measured because it has shown to be an important factor in many persuasion studies (Petty & Cacioppo, 1986). In a previous study by Mukherjee and Dubé (2012), the humour-fear interaction was mediated by message elaboration. Mukherjee and Dubé (2012) write “At the broadest level, our results indicate that fear increases motivation to process, while humor increases ability to process the message in the ad” (p 154). Theoretically, message complexity is expected to increase message elaboration since more cognitive resources are needed to process the message (Petty and Caccioppo, 1986). It is possible that the persuasive effect of metaphors can be explained by this mechanism. Previous research on visual metaphors has shown that complexity has had an influence on message acceptance and positive attitude toward the brand (Van Mulken *et al.*, 2010).

Message elaboration will be measured using a 12-item standardized scale validated by Reynolds (1997). This scale asks respondents to rate their agreement to 12 statements, each of which begin with “while reading the message were you”. This was adapted for a poster treatment by instead beginning each statement with “while viewing the poster were you”. All items in the scale are used. This variable is measured for descriptive purposes.

**Need for cognition.** As stated in the literature review, need for cognition has been shown to be an important variable related to fear appeals and visual metaphors. For this reason, need for cognition is measured in the study. This study uses the abbreviated 18-item need for cognition scale (Cacioppo, Petty, and Kao, 1984). Participants were asked to rate their agreement from strongly disagree (1) to strongly agree (7) on a likert scale. An example of an item on the need for cognition scale is “I would prefer complex to simple problems.” This scale was shown to have high reliability ( $\alpha=0.90$ ). Need for cognition has been shown to be an important variable in both fear and persuasion literature. This variable is measured for descriptive purposes.

## Chapter 4 – Results

This chapter outlines the findings of this study. This chapter will be divided into three sections: First, the data collection, demographics, and respondents' history with boating is described. Most of the questionnaire is made of a series of scales. The second section will describe the reliability and findings of these scales. Finally, findings related to each hypothesis will be described.

### Descriptive Statistics

**Data Collection.** Data was collected from two undergraduate courses at the University of Waterloo in the form of a questionnaire. Questionnaires were handed out and collected during lectures on two days: a third year recreation and leisure studies class (n=34) and a second year statistics class (n=142). In total, 176 students completed the questionnaire. Some of the questionnaires were not complete and as a result the response totals for each question may vary. The two courses were surveyed six days apart.

**Demographics.** The sample consisted of 113 females (66.9%) and 56 males (33.1%). The age of the respondents varied from 18 to 26 years old (M=20.14). Almost three-quarters of respondents were either 19 or 20 years old (n=123, 72.8%). Second-year students made up over three-quarters of the sample (n=132, 78.1%). The remainder was made up of 5 first year, 12 third year and 18 fourth year students. Only 13 were classified as new Canadians (7.7%): those who have lived in Canada less than 10 years. This was a bit disappointing considering that this group is considered at high risk of drowning.

**History of boating-related behaviour.** Participants' history and experience with boating was expected to be an important factor in influencing the intention to wear a life jacket. Although, it may be unclear whether familiarity with boating is expected to increase or decrease the



likelihood of that intention. The respondents were asked how many times during the past summer they went boating. Nearly a third of respondents had not been boating the previous summer (n=58, 33.1%). Roughly another third went boating once or twice (n=51), with the remaining third having gone boating 3 or more times (n=66).

**Table 1: Times Gone Boating Last Summer**

Variables	<i>N</i>	%
None	58	33.14
Once or twice	51	29.14
3 to 5 times	28	16.00
6 to 10 times	10	5.71
11 to 20 times	14	8.00
More than 20 times	14	8.00
n=175		

Respondents were asked, on a percentage scale of 0-100, what is the likelihood of wearing a life jacket given the situational text (M=66.9, SD=31.9). A comforting finding is that the most common response was 100% with 49 respondents answering such (28%). However, 18.9% answered that there was a less than 50% chance that they would wear a life jacket (n=33). Of the total sample, 41.7% answered with an even 50% (n=40). A t-test revealed that females (M=72.4, SD=28.7) responded as significantly more likely to wear a life jacket than males (M=55.3, SD=34.9);  $t(166)=3.38, p=0.001$ .

On the last page of the questionnaire, the respondents were asked once again about the likelihood they would wear a life jacket. This response would follow the treatment. The average response was an increased likelihood of wearing a life jacket (M=74.7 SD=28.6).

Respondents were asked to evaluate their swimming ability by answering with how many metres they could swim in a pool (less than 25m=1 to more than 400m=4). The most common

response was the highest possible “more than 400m” (n=62, 35.2%). Of the total, 23 responded that they could swim “less than 25m” (13.1%).

**Table 2: Swimming Ability**

Variables	<i>N</i>	%
Less than 25m	23	13.07
25 to 200m	57	32.39
201 to 400m	34	19.32
More than 400m	62	35.23
n=176		

When asked how far they could swim, the mean score (M=2.77) was just under 200 to 400m. (1=Less than 25m; 4=More than 400m). Perceived swimming ability was negatively related to intentions to wear a life jacket. Specifically, ANOVA revealed that those who reported being able to complete the longest swim distance were less likely to form intentions to wear a life jacket [F(3,171)=5.17, p=0.002].

**Table 3: Swimming Ability and Protection Motivation ANOVA**

F(3,171)=5.17, p=0.002	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE</i>
Swimming Ability				
Less than 25m	22	6.09	1.08	0.23
25 to 200m	55	5.35	1.56	0.21
201 to 400m	34	5.37	1.74	0.30
More than 400m	61	4.53	2.04	0.26
Total	172	5.16	1.80	0.14

A majority of respondents “never” drink alcohol when going boating (n=115, 65.7%). This is encouraging in that drinking alcohol has been identified by the Lifesaving Society as a factor in 38% of drowning fatalities where boating was the main activity (LSS, 2014). However, those who reported consuming more alcohol while boating were less likely to form intentions to wear a life jacket (see table 4).

**Table 4. Correlation of Alcohol consumption while boating and Protection Motivation**

Variables	Correlations	
	1	2
1. Alcohol Consumption while boating	--	-0.22 **
2. Protection Motivation	-0.22 **	--

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Below, the means for each history with boating variable are presented (see table 5).

Participants averaged almost 8 boating occasions during the previous summer.

**Table 5: Means Scores of History with Boating**

Variables	<i>M (%)</i>	<i>SD</i>
Times gone boating	7.77	19.24
Swimming ability	2.77	1.07
Alcohol consumption while boating	1.43	0.66
Likelihood of wearing life jacket	66.94	31.90

n=173

**Treatment Groups.** Recall, each questionnaire contained one of four treatment messages or a control message. Each group had a mean of 35.2 respondents in it.

**Table 6: Treatment Groups**

Treatment Groups	n
Gain-Frame & Literal Image	36
Gain-Frame & Visual Metaphor	38
Loss-Frame & Literal Image	36
Loss-Frame & Visual Metaphor	32
Control	34

n=176

### Questionnaire Scales

The questionnaire included seven protection motivation model variables: seriousness, vulnerability, fear arousal, response efficacy, self-efficacy, response costs, and protection motivation. In addition, the questionnaire also measured two scales for descriptive purposes: need

for cognition, and message elaboration. These scales ranged from single-item measures (i.e. seriousness and vulnerability) to 18-items. Each scale was found to be reliable.

**Table 7: Reliability of Scales**

Variables	No. Items	$\alpha$
Need for Cognition	18	0.881
Message Elaboration	12	0.858
Fear Arousal	4	0.862
Response Efficacy	3	0.878
Self-efficacy	5	0.631
Response Costs	3	0.678
Protection Motivation	2	0.933

Each of the items was measured using a 7-point scale. Mean scores ranged from 2.18 to 6.20. A summary of the mean scores from the questionnaire can be found in table 7.

**Table 8: Means for Scales, Protection Motivation Variables**

Variables	<i>M (%)</i>	<i>SD</i>
Need for Cognition	4.59	0.82
Message Elaboration	4.24	0.98
Seriousness	3.67	2.00
Vulnerability	3.01	1.56
Fear Arousal	2.52	1.25
Response Efficacy	6.20	1.22
Self-efficacy	6.11	0.84
Response Costs	2.18	1.12
Protection Motivation	5.16	1.80

n=170

**Need for Cognition.** Need for cognition refers to “the tendency for people to vary in the extent to which they engage in and enjoy effortful cognitive activities.” (Cacioppo & Petty, 1982, p 116). It was measured using an 18-item scale. This scale was shown to be highly reliable ( $\alpha=0.881$ ). All items used a 7-point likert scale. Taken together, the mean score was  $M=4.59$ . This

is more than a whole point above the mid-point, demonstrating that respondents enjoyed undertaking tasks that were cognitive in nature.

Once participants completed the need for cognition portion of the survey, they were exposed to the control and treatment messages. As a result, results offered from this point on reflect those treatments. It must be acknowledged that the treatment messages may have altered response patterns. This will be explored as hypotheses are addressed. This section of the thesis simply reports descriptive data for insight into the participant group beliefs and assessments.

**Message Elaboration.** The scale for message elaboration measured the extent to which each respondent elaborated on the treatment message with which they were presented. Message elaboration was measured with a standardized 12-item scale. This scale was found to demonstrate an internal consistency of  $\alpha=0.858$ . Respondents gave a mean score of 4.24 (SD=0.98) on a 7 point scale. This suggests only moderate levels of message elaboration took place.

**Seriousness and Vulnerability.** Seriousness and Vulnerability were both measured using single-items. Overall, seriousness was reported in the middle of the scale (M=3.67, SD=2.00). Vulnerability was judged to be just low of the middle (M=3.01, SD=1.56). This suggests that respondents judged the consequences of not wearing a life jacket and falling into the water to be neither high nor low. Respondents felt similarly about their vulnerability. Respondents judged their vulnerability to be moderate: neither high nor low.

**Table 9: Seriousness and Vulnerability**

Variables	<i>M</i>	<i>SD</i>
Seriousness: How serious would it be if you were to fall into open water without a life jacket?	3.67	2.00
Vulnerability: How likely is it that you might die if you decide not to wear a life jacket during this canoe trip?	3.01	1.56

n=173

Females ( $M=4.05$ ,  $SD=2.03$ ) reported significantly higher scores for seriousness than did males ( $M=2.93$ ,  $SD=1.74$ );  $t(166)=3.55$ ,  $p=0.001$ . Additionally, females also scored higher for vulnerability ( $M=3.37$ ,  $SD=1.61$ ) than males ( $M=2.34$ ,  $SD=1.20$ );  $t(166)=4.22$ ,  $p<0.001$ . Females in this study found the consequences of not wearing a life jacket to be much more severe than did men. Females also reported being more vulnerable to the threat of death by drowning than did men.

**Fear Arousal.** Fear arousal represents the reported fear as a result of the treatment message. While fear arousal is reported in more detail under hypotheses 1 and 2, its overall mean is reported here. Fear arousal was measured using a 4-item 7 point scale. The scales achieved high internal consistency ( $\alpha=0.862$ ). Respondents reported a mean score of  $M=2.52$  ( $SD=1.25$ ). Overall, fear arousal was low. It appears as though respondents did not find the treatment messages to elicit much fear. Item 4, “restful/excited” was reported to be the highest ( $M=2.67$ ) while item 3, “calm/agitated”, was reported as the lowest ( $M=2.38$ ).

**Table 10: Fear Arousal**

Variables	<i>M</i>	<i>SD</i>
Fear Arousal 1: Unafraid/Afraid	2.42	1.49
Fear Arousal 2: Relaxed/Tense	2.63	1.57
Fear Arousal 3: Calm/Agitated	2.38	1.38
Fear Arousal 4: Restful/Excited	2.67	1.49

n=174

**Response Efficacy.** Response efficacy refers to the extent to which participants perceive life jackets to be an effective tool for preventing death from drowning while on a canoe trip. A mean score of  $M=6.20$  ( $SD=1.22$ ) was reported for response efficacy. This was the highest mean score of any measure studied. It appears that this sample largely agreed that life jackets are an

effective means for preventing death by drowning. Response efficacy was measured using a 3-item scale with high reliability ( $\alpha=0.878$ ).

**Table 11: Response Efficacy**

Variables	<i>M</i>	<i>SD</i>
Response Efficacy 1: If I fell in the water during the trip, wearing a life jacket will lower my chances of dying	6.12	1.51
Response Efficacy 2: If I fell in the water during the trip, wearing a life jacket will increase my chances of survival	6.31	1.26
Response Efficacy 3: If I fell in the water during the trip, wearing a life jacket will keep me alive long enough for someone to rescue me	6.18	1.29

n=173

**Self-efficacy.** Self-efficacy refers to participants' perception of their own abilities to properly carry out the recommended protective behaviour: in this case, we asked participants about their abilities to properly use a life jacket. The respondents in this study were very confident in their abilities to properly use a life jacket. Overall, self-efficacy was reported with a mean score of  $M=6.11$  ( $SD=0.84$ ). Respondents were slightly less confident in their ability to put on a life jacket while in the water (see table 11). This scale had a reliability score of  $\alpha=0.631$ . New Canadians ( $n=13$ ) reported significantly lower scores for self-efficacy ( $M=5.48$ ,  $SD= 1.18$ ) than those who have lived in Canada for more than 10 years ( $M=6.17$ ,  $SD=0.78$ );  $t(167)=-2.94$ ,  $p=0.004$ . This suggests that new Canadians are less confident in their ability to properly wear a life jacket.

**Table 12: Self-Efficacy**

Variables	<i>M</i>	<i>SD</i>
Self Efficacy 1: Put a life jacket on by myself while on land	6.75	0.77
Self Efficacy 2: Put a life jacket on by myself while on a boat	6.70	0.75
Self Efficacy 3: Put a life jacket on by myself while in the water	5.45	1.75
Self Efficacy 4: Wear a life jacket whenever I go boating	6.13	1.42
Self Efficacy 5: Save myself from dying if I fall into the water	5.54	1.60

n=172

**Response Costs.** Respondents largely agreed that the benefits of wearing a life jacket outweigh the costs (see table 13) of doing so. Respondents reported an overall score that the costs of wearing a life jacket are low ( $M=2.18$ ,  $SD=1.12$ ). When response costs are high, they represent a barrier towards performing the recommended safety response. A low score, like the one observed in this study, demonstrates that respondents found the barriers to wearing a life jacket would not prevent them from wearing one when the situation arises. This scale demonstrated reliability of  $\alpha=0.678$ .

**Table 13: Response Costs**

Variables	<i>M</i>	<i>SD</i>
Response Costs 1*: The benefits of wearing a life jacket outweigh the costs	1.71	1.11
Response Costs 2: Wearing a life jacket while in the canoe would cause too many problems	2.38	1.51
Response Costs 3: I am discouraged from wearing a life jacket because I would feel silly doing so	2.47	1.63
n=172	*reverse coded	

There was a significant difference in mean scores of males ( $M=2.54$ ,  $SD=1.40$ ) and females ( $M=2.00$ ,  $SD=0.90$ );  $t(167)=-3.02$ ,  $p=0.003$ . This finding suggests that males perceive response costs as more severe than females. Males reported a higher mean score for response costs on all three items in the response costs scale.

**Protection Motivation.** Protection motivation is synonymous with intention to perform the recommended protective behaviour. In this case, protection motivation refers to one's intention to wear a life jacket while on a canoe trip. It was measured using a 2-item scale. Overall, respondents reported a mean score of  $M=5.16$  ( $SD=1.80$ ) on a scale of "definitely not"=1 to "definitely yes"=7. This suggests that participants were, on average, quite likely to intend to wear a life jacket. This scale had a Cronbach's alpha of  $\alpha=0.933$ .



**Table 14: Protection Motivation**

Variables	<i>M</i>	<i>SD</i>
Protection Motivation 1: How likely or unlikely is it that you will wear a life jacket when you're in the canoe?	5.14	1.84
Protection Motivation 2: Do you plan to wear a life jacket whenever you're in the canoe?	5.18	1.88

n=172

Protection motivation differed between females ( $M=5.50$ ,  $SD=1.70$ ) and males ( $M=4.50$ ,  $SD=1.83$ );  $t(167)=3.50$ ,  $p=0.001$ . Consistent with the pre-treatment question about likelihood to wear a life jacket, females demonstrate that after considering the treatment messages they continue to be more likely to protect themselves by using a life jacket than males.

**Protection Motivation Model.** Finally, a linear regression analysis was used to determine the relative influence of variables on intention to wear a life jacket. The following relationships are expected: it states perceptions of a) severity, b) vulnerability, c) self-efficacy, and d) response efficacy will be positively associated with protection motivation while e) perceptions of response costs will be negatively associated with protection motivation. A number of related variables were also included in the model (i.e. age, gender, times gone boating, swimming ability, alcohol consumption, and message elaboration). The result was significant [ $F(12,164)=13.35$ ,  $p<0.001$ ], with an adjusted  $R^2$  of 0.48. Two variables were significant predictors of intention to wear a life jacket: a) reporting fewer barriers to wearing the jacket and b) reporting less frequent alcohol consumption were both associated with greater intention to wear a life jacket.

**Table 15 - Regression Coefficients for the Protection Motivation model**

Independent Variables				
	Coefficient		SE	B
Constant	6.987	***	2.341	
Age	.044		.082	0.03
Gender	-.401		.240	-0.11
Times Gone Boating	-.011		.006	-0.12
Swimming Ability	-.151		.118	-0.09
Alcohol consumption	-.444	**	.168	0.16
Message Elaboration	.130		.113	0.07
Seriousness	.018		.079	0.02
Vulnerability	.078		.097	0.07
Fear Arousal	.059		.088	0.04
Response Efficacy	.177		.095	0.12
Self-efficacy	-.232		.150	-0.11
Response Costs	-.801	***	.105	-0.50
Adjusted r <sup>2</sup>	0.48			
n=164				*p<.05, **p<.01, ***p<.001

### Answering Hypotheses

**Hypothesis 1.** Hypothesis 1 predicted that messages referring to consequences (in this case lives lost or saved due to wearing life jackets) will generate a greater fear response than will a neutral message (referring readers to a website). This hypothesis was supported. An ANOVA revealed that there were significant differences between treatment and control groups [F(4,173)=3.96, p=0.004). A Tukey HSD post-hoc test revealed that there were significant differences between the control group (M=1.79, SD=0.97) and each of the treatment groups. There was no significant differences between the treatment groups.

**Table 16: Fear Arousal and Treatment Group ANOVA**

F(4,173)=3.96, p=0.004	N	M	SD	SE
Treatment Groups				
Gain-Frame & Literal Image	35	2.74 <sup>b</sup>	1.27	0.22
Gain-Frame & Visual Metaphor	38	2.59 <sup>ab</sup>	1.37	0.22
Loss-Frame & Literal Image	35	2.76 <sup>b</sup>	1.26	0.21
Loss-Frame & Visual Metaphor	32	2.73 <sup>b</sup>	1.10	0.19
CONTROL	34	1.79 <sup>a</sup>	0.97	0.17
Total	174	2.52	1.25	0.09

Superscript denotes subsets as determined by Tukey post hoc analysis

**Hypothesis 2.** Hypothesis 2 stated that messages referring to negative consequences (in this case death due to drowning) will generate a greater fear response than will messages referring to lives saved. This hypothesis was not supported. Respondents who were given a negative consequence treatment message did not differ in fear arousal scores ( $M=2.75$ ,  $SD=1.18$ ) from those who were given a message referring to lives saved ( $M=2.66$ ,  $SD=1.32$ ):  $t(138)=0.40$ ,  $p=0.688$ . The loss-framed message failed to generate more fear arousal than did the gain-framed message. There was no evidence that framing played a role in increasing fear arousal. In descriptive terms, these results suggest that loss framed messages could be effective in generating fear. However, these results are not statistically significant so more study is required.

This lack of effect sent ripples across the rest of the tests. Support for hypothesis 2 was critical for setting up the high versus moderate fear arousal relationship needed for a test of hypothesis 3 & 4. Without support for hypothesis 2, it is not surprising that the tests for hypothesis 3 & 4 did not yield supportive results (see below).

**Hypothesis 3.** Recall that hypothesis 3a states: messages intended to create moderate levels of fear will be more persuasive (in terms of intentions to wear a life jacket) than will neutral messages. Hypothesis 3b stated: messages intended to create moderate levels of fear will

be more persuasive (in terms of intentions to wear a life jacket) than will high fear messages. A single ANOVA was used to test both hypotheses. Respondents did not differ in their mean scores for intention to wear a life jacket between treatment groups or the control group [ $F(4,171)=0.25, p=0.910$ ]. Since the protection motivation scale and the likelihood to wear a life jacket measure both asked about one's intention to wear a life jacket, this test was also performed by substituting the protection motivation scale for the post-treatment likelihood to wear a life jacket. However, this test did not result in significant between group differences [ $F(4,168)=1.21, p=0.310$ ].

**Table 17: Protection Motivation and Treatment Group ANOVA**

$F(4,171)=0.25, p=0.910$	N	M	SD	SE
Treatment Groups				
Gain-Frame & Literal Image	34	5.29	1.84	0.32
Gain-Frame & Visual Metaphor	38	4.97	1.94	0.31
Loss-Frame & Literal Image	34	5.15	1.63	0.28
Loss-Frame & Visual Metaphor	32	5.34	1.80	0.32
CONTROL	34	5.07	1.82	0.31
Total	172	5.16	1.80	0.14

**Hypothesis 4.** Hypothesis 4 stated that under high fear conditions, a message using a metaphorical image will be more persuasive (in terms of intentions to wear a life jacket) than one using a literal image. The metaphors are thought to mitigate the negative effects of high fear appeals. Participants did not differ either in fear arousal scores or in elaboration levels. Consequently, there were no significant differences between any groups. There was not a difference in mean scores between metaphor image ( $M=5.34, SD=1.80$ ) and literal image treatment groups ( $M=5.15, SD=1.63$ );  $t(64)=0.47, p=0.643$ . Additionally, a one-way ANOVA did not yield any significant between group differences. In descriptive terms, these results

suggest that visual metaphors could be effective in increasing persuasion. However, these results are not statistically significant so more study is required.

Specifically, they generate more elaboration in spite of fear-based messages. The negative consequences of the fear appeal are therefore reduced. Unfortunately, treatment groups and the control did not differ in message elaboration scores [ $F(4,174)=1.47, p=0.19$ ]. The same level of elaboration was present regardless of message content or format.

A Tukey HSD post hoc tests suggested that, although non-significant, a pattern did emerge in terms of elaboration.

**Table 18: Message Elaboration and Treatment Group ANOVA**

$F(4,174)=1.47, p=0.19$	N	M	SD	SE
Treatment Groups				
Gain-Frame & Literal Image	36	4.28	0.94	0.16
Gain-Frame & Visual Metaphor	38	4.34	0.78	0.13
Loss-Frame & Literal Image	35	4.28	0.92	0.15
Loss-Frame & Visual Metaphor	32	4.41	1.02	0.18
CONTROL	34	3.88	1.17	0.20
Total	175	4.24	0.98	0.07

Participants in the loss-frame and visual metaphor group reported scores that were moving away from the control group. While this is suggestive, no conclusions can be drawn. This suggests why hypothesis 4 failed to be supported.

### Summary

In summary, this study found a number of interactions between descriptive characteristics and intention to wear a life jacket. There were several interesting differences between males and females that were related to females reporting a higher likelihood to protect themselves by

wearing a life jacket than men. Females scored significantly higher on severity and vulnerability. Males scored higher on response costs.

However, only hypothesis 1 was supported. The overall goal of this study, to find an analogous relationship between visual metaphors and humour was not supported. Visual metaphors was not found to offer a persuasive benefit in this fear appeal. Visual metaphors were not found to mitigate defensive responses caused by fear.

## Chapter 5 – Conclusion

This study explores the interactive effect of high fear arousal and visual metaphors on persuasion in fear appeals. An experiment was conducted to study that interaction. Unfortunately, no one treatment message was able to create more fear than was another. As a result, the relative efficacy of one approach over another could not be determined. However, this study was able to find a number of important factors which are influential in the decision making process of those choosing to wear a life jacket or not.

The goal of this section is to describe the sample of students who took part in this study. First, almost all (98.8%) of the respondents were between 18 and 24 years of age. This is particularly important because this age groups has the highest water-related death rate of any age group in Canada (LSS, 2014). Although this study does not use a representative sample, findings from this study may give insight into the thought processes and decision making of Canadians in this age group.

Second, these respondents were not heavy drinkers while boating. Moran *et al.* (2011) found that those who tend to consume alcohol before swimming tend to engage in risky behaviours ranging from failing to wear life jackets to encouraging others to take risks. It isn't surprising that alcohol has been a factor in a considerable amount of drowning fatalities (LSS, 2014). Respondents in this study reported relatively limited alcohol use while boating. Only 8% of all respondents (n=14) reported that they either always or usually consumed alcohol while boating. Prior research (e.g. Moran, 2011; Howland *et al.*, 1996) has found that men are more likely to consume alcohol before water related activities than women. However, there was no significant difference between men and women with regard to self-reported alcohol consumption while boating in this study.

**Alcohol consumption while boating.** Consumption of alcohol while boating was found to be correlated with protection motivation ( $p=0.004$ ). This means that those who consumed the least amount of alcohol were most likely to intend to wear a life jacket. This supports the findings of Moran *et al.* (2011) who reported that the consumption of alcohol is related to other dangerous behaviours.

**Swimming ability.** We collected the number of metres participants believed they could swim without stopping. Those reporting being able to swim longer distances were less likely to intend to wear a life jacket. Confidence in one's ability leads to lower perceptions of risk and consequently reduced sense of need for a life jacket. This optimistic sense of control over a situation may lead to poor decision making while on the water (Weinstein, 2001).

**Donning a life jacket.** The sample of new Canadians for this study was quite small ( $n=13$ ). However, it is interesting to note that new Canadians reported lower self-efficacy scores that did those who have lived here for more than 10 years. This suggests that new Canadians were less confident in their abilities to properly wear a life jacket than Canadians who have lived in Canada for more than 10 years. This highlights a need for education on life jacket use for this group.

**Perceptions of risk.** This study found a number of differences in how males and females perceive risk related to wearing a life jacket. Females rated severity and vulnerability higher than males. Males have been found to perceive consequences as less severe and find themselves to be less vulnerable to harm in a number of studies (e.g. Boer & Emmons, 2004; Glendon & Walker, 2013; Moran, 2011).

Additionally, females rated both their likelihood to wear a life jacket and their intention to wear one in the future higher than males. This finding represents a possible explanation for the increased fatality rate that we see in the population of male Canadians: nearly 8 out of 10 drowning



fatalities in Canada are men (LSS, 2014). Young men, in particular, have been shown to engage in a number of “dangerous masculinities” as Moran *et al.* (2011) terms it. Young men tend to engage in a number of risky behaviours (e.g. ignoring safety advice, encouraging others to take risk, not wearing life jackets, using alcohol) around water which may increase their risk of drowning and death. This study lends support to the findings of Moran *et al.* (2011) which show that men are less likely to intend to use life jackets. Practitioners should continue to target the male demographic when it comes to life jacket use.

**Response costs.** The likelihood of males to form weaker intentions to wear a life jacket may be explained by experiencing response costs as more meaningful. Response costs are those factors which are barriers or drawbacks from wearing a life jacket. Males rated response costs higher than did females. Males displayed a higher mean on all three items in the response costs scales. Although, response costs had an overall low mean score for males, the significant difference suggests that males consider the costs of wearing a life jacket to a much greater degree. This is highlighted by regression analysis showing that response costs were the best predictor of intention to wear a life jacket. Considering that 8 out of 10 drowning fatalities is men, specifically targeting the response costs of men may be a strategy which yields large benefits for public health campaigns.

**Answering Hypotheses.** Recall that hypothesis 1 stated: a message referring to consequences (in this case lives lost or saved due to wearing life jackets) will generate a greater fear response than will a neutral message. This hypothesis was supported. This suggests that a message containing information about the consequences of neglecting protective behaviour is sufficient for generating fear. A premise of PMT is that fear motivates one to elaborate on the merits of the message.

Hypothesis 2 stated: messages referring to negative consequences (in this case death due to drowning) will generate a greater fear response than will messages referring to lives saved. This hypothesis was not supported. There was no difference in fear arousal between the loss- and gain-framed treatment groups. This suggests that the use of loss- and gain- framing was not sufficient for generating different levels of fear arousal. Loss-framing has been shown to increase persuasion and message processing in comparison with a gain-framed message (O’Keefe & Jensen, 2008; 2009). Fear has also been shown to increase both persuasion and message processing (Rotfield, 1988). Van’t Riet & Ruiter (2010) suggest that loss-framing may be persuasive due to an increase in fear. However, the loss frames provided here did not lead to an increase in fear. The lack of effect caused ripples throughout the study. Support for hypothesis 2 was critical for setting up the high versus moderate fear arousal relationship needed for a test of hypothesis 3 & 4. Without support for hypothesis 2, it is not surprising that the tests for hypothesis 3 & 4 did not yield supportive results.

Hypothesis 3a stated: messages intended to create moderate levels of fear would be more persuasive (in terms of intentions to wear a life jacket) than will neutral messages. This hypothesis was not supported. Those who received a neutral message were equally likely to form intentions as those who received a fear appeal. The conclusion can be drawn that this gain-framed message did not have a persuasive effect.

Hypothesis 3b stated: messages intended to create moderate levels of fear would be more persuasive (in terms of intentions to wear a life jacket) than would high fear messages. High and moderate fear groups did not differ in their intentions to wear a life jacket. This hypothesis was not supported. High fear messages were hypothesized to be less persuasive due to the effect of

defensive responses. As Mukherjee & Dubé (2012) have shown, moderate fear is more persuasive than high fear when high fear leads to defensive responses.

To help explain the results of hypothesis 4, we tested for differences in message elaboration between treatment groups. We expected that those who were excessively aroused by fear (those in the loss-frame groups expected to generate high fear arousal) would be less likely to attend to the treatment message. Again, although these participants received a high fear message, the message did not elicit high fear arousal scores. Not surprisingly, response patterns did not vary across the groups.

Overall, fear arousal scores were low. Although, the participants in the high fear treatment groups were given a message intended to create high fear conditions, ultimately the message failed to arouse high levels of fear.

This study used loss-framed messages to encourage high fear conditions. They were largely ineffective in this case. Perhaps it was a function of the setting; O’Keefe and Jensen (2009) report that loss-framed messages are more persuasive for disease detection behaviours. Perhaps disease detection behaviours are not analogous to protective behaviours as argued in the literature review.

Hypothesis 4 stated that, under high fear conditions, a message using a metaphorical image would be more persuasive (in terms of intentions to wear a life jacket) than one using a literal image. Unfortunately, although participants were exposed to a high fear message, they failed to exhibit a high fear response. More than that, there were no differences in the persuasiveness of metaphorical versus literal images. This hypothesis was not supported.

Finally, the relative contribution of the variables included in the protection motivation model (severity, vulnerability, response costs, response efficacy, self-efficacy, fear, and protection motivation) was examined through multiple linear regression analyses. Recall that the protection

motivation model provided in Chapter 1 suggested the importance of boater response to situational and personal variables. Several other variables (i.e. swimming ability, times gone boating last summer, alcohol consumption while boating, message elaboration, gender, and age) known to be influential were collected and included in the regression analyses. We wished to discover the relative influence of these many variables on intention to wear a life jacket. Results of these analyses are again offered here.

**Table 19 - Regression Coefficients for the Protection Motivation model**

Independent Variables				
	Coefficient		SE	B
Constant	6.987	***	2.341	
Age	.044		.082	0.03
Gender	-.401		.240	-0.11
Times Gone Boating	-.011		.006	-0.12
Swimming Ability	-.151		.118	-0.09
Alcohol consumption	-.444	**	.168	0.16
Message Elaboration	.130		.113	0.07
Seriousness	.018		.079	0.02
Vulnerability	.078		.097	0.07
Fear Arousal	.059		.088	0.04
Response Efficacy	.177		.095	0.12
Self-efficacy	-.232		.150	-0.11
Response Costs	-.801	***	.105	-0.50
Adjusted $r^2$	0.48			
n=164				* $p < .05$ , ** $p < .01$ , *** $p < .001$

This model was able to explain 48% of variance in protection motivation. This supports the body of literature on protection motivation as another successful test of the protection motivation model. This demonstrates that PMT is valuable when studying intention to wear life jackets while boating. Response costs were the strongest predictor of protection motivation. Meta-analytic reviews of PMT shows that coping appraisal variables have often been the best predictors of the PMT model (Milne *et al*, 2000; Floyd *et al*, 2000).

## **Directions for Future research**

This study hypothesized that using a metaphorical image in a fear appeal message would lead to increased persuasion when the audience experienced high fear. The inclusion of a visual metaphor was predicted to interact with high fear as humour does: reducing defensive responses and increasing persuasion. This question remains unanswered: it remains unclear whether visual metaphors will operate in a similar manner to humour when included in a fear appeal. This is likely due to the overall low fear arousal scores reported by respondents of this study. Future research should continue to explore the relationship between visual metaphors and fear.

Both gain- and loss- framing produced moderate fear arousal in this study. It appears as though these findings may indicate that a short fear message may be perceived as equivalent in both frames. However, there is a large body of findings which points to the opposite assumption (e.g. Tversky & Kahneman, 1992; O'Keefe & Jensen, 2007; 2008). It may be that the consequences described in this study were not severe enough to elicit a strong fear response. Future research should explore the relationship between gain- and loss- framing in the protection motivation model.

Future research should seek to discover the large array of factors which contribute to new Canadians drowning at much higher than the national rate. These data suggest new Canadians report less confidence in properly wearing a life jacket. Perhaps this indicates less competence and confidence when around the water.

Researchers should continue to study how potential users assess the costs of wearing a life jacket. The regression model suggested that these "response costs" were the greatest predictor of intention not to wear a life jacket. One of the challenges to studying response costs is that they

differ from one context to another. Future research develop standardized measures which can be used in a broad variety of studies.

### **Future Directions for Practitioners**

Specifically, we learned about the thought processes of 18 to 24 year olds. Fear arousal scores were reported to be very low. Additionally, severity and vulnerability were poor predictors of intention to wear a life jacket. This may suggest that other forms of messages may be more persuasive than fear appeals. Messages which focus on celebrity endorsement, technical features, high performance, or style may be more persuasive. For example, Mustang Survival has used professional angler Dave Mercer to endorse their “Elite” inflatable life jacket in the SAIL Catalogue. Future research should explore if using positive role models to endorse safety behaviour and equipment is beneficial for persuasion.

This does not suggest that fear appeals should be abandoned altogether. The findings of this study also showed that even low scores for fear arousal can increase message elaboration. Practitioners should continue to use fear appeals to capture the attention of their audience.

This study found that an increase in one’s confidence in their swimming ability led to lower intentions to wear a life jacket. Practitioners should keep this in mind when designing public health messages by drawing attention to the flawed logic which leads to overconfidence. With respect to promoting life jacket use, practitioners might design a message which shows that being a strong swimmer may not be enough to save you from drowning.

Although in a small sample, the new Canadians in this study were not as confident in their abilities to wear a life jacket properly and save themselves from harmful consequences. Practitioners should continue to target new Canadians as a group in need of water safety training even with something as simple as how to wear a life jacket.

Practitioners should continue to target the male demographic when it comes to life jacket use. Males reported lower intentions to wear a life jacket than females. This is explained by males reporting lower scores for severity and vulnerability while also scoring higher on response costs.

### **Limitations**

The hypotheses set forth in this study were cumulative in nature. Early hypotheses set the stage for later statements. Conditions outlined in hypotheses 2 were particularly important. The treatment (loss) message used to assess this hypothesis was intended to create generate fear. This fear would then influence subsequent responses. This treatment was ineffective in creating this fear. As a result, it was not present when other messages were presented. Response patterns may have been diminished as a result.

This study did not seek to gather a sample which was representative of any population. Results were discussed in terms of this sample. Generalizations to the population at large cannot be made, however, results of this study may give insight into the thought processes of Canadians when it comes to drowning.

**Challenges of experimental design.** There were some challenges to performing an experimental design study. Particularly, the classroom study brought up some concerns. In many cases, students sit quite close to each other during lectures leading to possible contamination (i.e. the student of one treatment group may be able to look at a nearby students' questionnaire and notice that they have received different treatments). The classrooms of today may present students with many distractions; as laptops and cell phones are commonplace. These devices may distract participants when data is being collected through a questionnaire. Future research should seek to mitigate the effects of contamination and distraction from electronic devices.

## **Conclusion**

This study was able to identify a number of factors which are influential in the decision making process of those going boating and choosing whether to wear a life jacket or not. A regression model highlighted some important predictors of forming intentions to wear a life jacket. Those who considered response costs to be more of an issue formed weaker intentions to wear a life jacket. However, this study fell short of meaningful findings about visual metaphors and their interaction with fear appeals. Only hypothesis 1 was supported while hypotheses 2, 3, & 4 were not. Without support for these hypotheses this study was not able to find support for visual metaphors acting in an analogous fashion to humour. Visual metaphors did not add a persuasive benefit and did not mitigate defensive responses which may be caused by excessive fear. However, descriptively the results suggest a trend that fear may be aroused through a loss-framed message and so future research is required. Additionally, descriptively, the results suggest that a visual metaphor may be more persuasive than a literal image when a loss-framed message is used. These hypotheses should not be thrown out but should be tested again. A future test should be certain to generate sufficient fear.



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Appendix A – Lifesaving Society & Safeboater.ca poster (Gain-frame & Visual Metaphor)

**100 lives could be saved each year  
simply by wearing a life jacket**



**PULL  
IN CASE  
OF  
DROWNING**

**See the New light weight **Pull Cord**  
Inflatable Life Jackets at...**

**SmartBoater.ca**



Appendix B – Gain-frame & literal image

**100 lives could be saved each year  
simply by wearing a life jacket**



**See the New light weight Pull Cord  
Inflatable Life Jackets at...**

**SmartBoater.ca**



Appendix C – Loss-frame & visual metaphor

**100 People die each year  
by neglecting to wear a life jacket**



**See the New light weight Pull Cord  
Inflatable Life Jackets at...**

**SmartBoater.ca**



Appendix D – Loss-frame & literal image

**100 People die each year  
by neglecting to wear a life jacket**



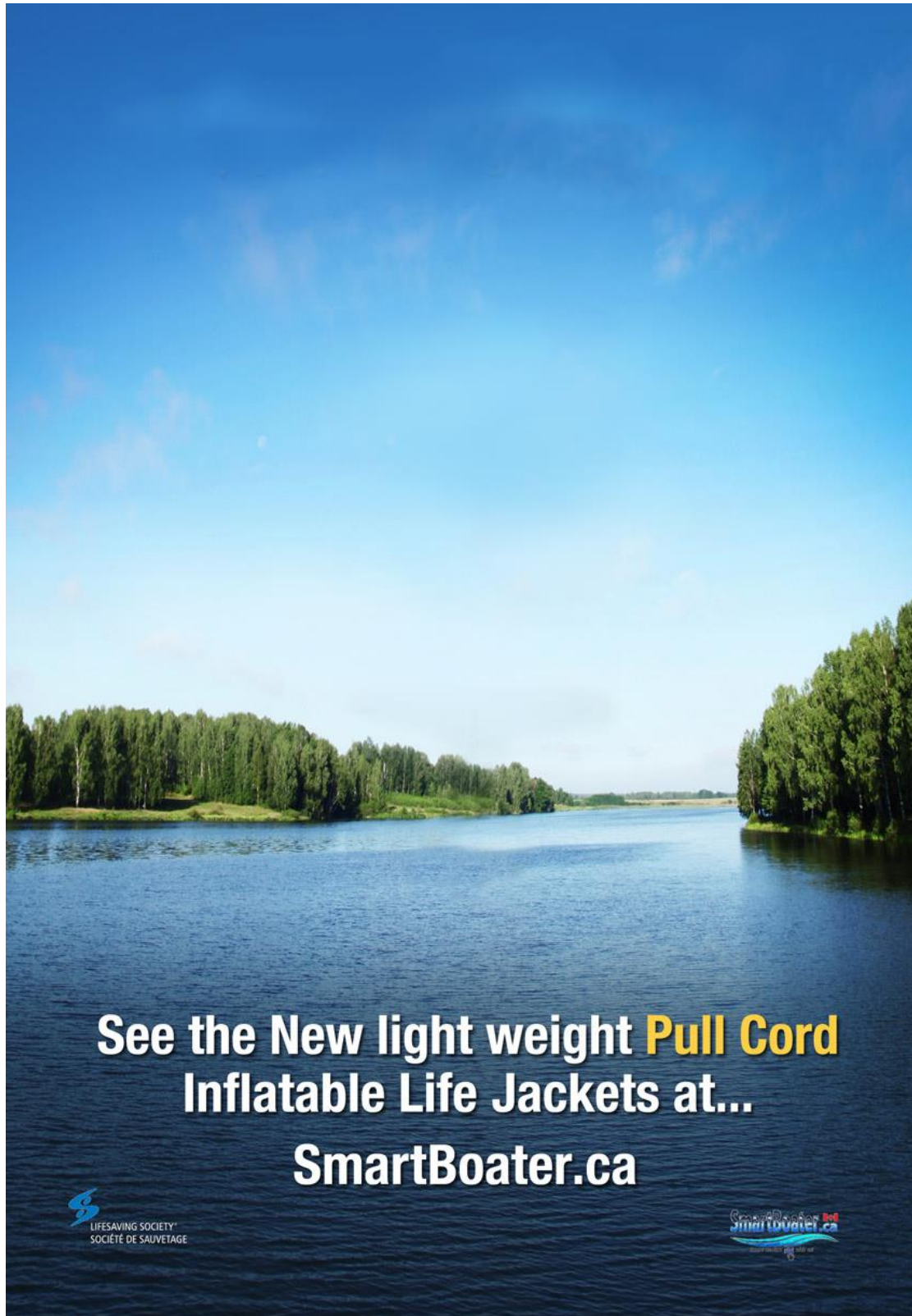
**See the New light weight Pull Cord  
Inflatable Life Jackets at...**

**SmartBoater.ca**





Appendix E – Control message poster



## Appendix F – Survey Instrument

### PART A: History and Experience with boating

*The following questions are designed to let us know more about your history and experience with boating.*

1) **How many times during the past summer did you go boating** (e.g. power boating, canoeing, kayaking, stand up paddle boarding, windsurfing, sailing, etc.)? \_\_\_\_\_.

2) **How many metres can you currently swim in a pool without stopping or touching the bottom?**  
(NOTE: A typical pool is 25m long)

LESS THAN 25m

25 to 200m

201 to 400m

MORE THAN 400m

3) **Do you ever consume alcohol before or while going on a boat?**

ALWAYS

OFTEN

SOMETIMES

NEVER

4) **When in or on a personal watercraft** (e.g. power boating, canoeing, kayaking, stand up paddle boarding, windsurfing, sailing, etc.), **what is the likelihood that you will wear a life jacket?** (*please give a number between 0% and 100% where 0% is you never wear a life jacket and 100% is you always wear one.*) \_\_\_\_\_%.

**PART B:**

*The following questions are concerned with your attitude toward complex versus simple tasks. Please rate your agreement to the following statements.*

	Disagree						Agree
	1	2	3	4	5	6	7
I would prefer complex to simple problems	1	2	3	4	5	6	7
I like to have the responsibility of handling a situation that requires a lot of thinking	1	2	3	4	5	6	7
Thinking is not my idea of fun	1	2	3	4	5	6	7
I would rather do something that requires little thought than something that is sure to challenge	1	2	3	4	5	6	7
I try to anticipate and avoid situations where there is likely chance I will have to think in depth about	1	2	3	4	5	6	7
I find satisfaction in deliberating hard and for long hours	1	2	3	4	5	6	7
I only think as hard as I have to	1	2	3	4	5	6	7
I prefer to think about small, daily projects to long-term ones	1	2	3	4	5	6	7
I like tasks that require little thought once I've learned them	1	2	3	4	5	6	7
The idea of relying on thought to make my way to the top appeals me	1	2	3	4	5	6	7
I really enjoy a task that involves coming up with new solutions to problems	1	2	3	4	5	6	7
Learning new ways to think doesn't excite me very much	1	2	3	4	5	6	7
I prefer my life to be filled with puzzles that I must solve	1	2	3	4	5	6	7
The notion of thinking abstractly is appealing to me	1	2	3	4	5	6	7
I would prefer a task that is intellectual, difficult, and important to one that is somewhat important	1	2	3	4	5	6	7
I feel relief rather than satisfaction after completing a task that required a lot of mental	1	2	3	4	5	6	7
It's enough for me that something gets the job done; I don't care how or why it works	1	2	3	4	5	6	7
I usually end up deliberating about issues even when they do not affect me personally	1	2	3	4	5	6	7

**Part C:** Please consider the following situation when answering all subsequent questions on this survey.

You have been asked by some friends to go on a full day canoe trip on a warm July day on a large lake north of Toronto. There will be two canoes with two people in each. We are interested in your use of a life jacket during such a trip.

**PART D:** Please look at this poster ...

**100 lives could be saved each year  
simply by wearing a life jacket**



**See the New light weight Pull Cord  
Inflatable Life Jackets at...**

**SmartBoater.ca**

 LIFESAVING SOCIETY  
SOCIÉTÉ DE SAUVETAGE

 SmartBoater.ca

**PART E:**

The following questions are concerned with your thoughts while viewing the poster on pg 3. Please **circle the number** which best corresponds with your level of agreement:

WHILE VIEWING THE POSTER WERE YOU ...

	Disagree				Agree		
Attempting to analyse the issues in the message	1	2	3	4	5	6	7
Not very attentive to the ideas	1	2	3	4	5	6	7
Deep in thought about the message	1	2	3	4	5	6	7
Unconcerned with the ideas	1	2	3	4	5	6	7
Extending a good deal of cognitive effort	1	2	3	4	5	6	7
Distracted by other thoughts not related to the message	1	2	3	4	5	6	7
Not really exerting your mind	1	2	3	4	5	6	7
Doing your best to think about what was written	1	2	3	4	5	6	7
Reflecting on the implications of the argument	1	2	3	4	5	6	7
Resting your mind	1	2	3	4	5	6	7
Searching your mind in response to the ideas	1	2	3	4	5	6	7
Taking it easy	1	2	3	4	5	6	7

Please indicate the degree to which each of the following adjectives describes how you felt while viewing the poster in Part D.

	Unafraid				Afraid		
Afraid/Unafraid?	1	2	3	4	5	6	7
	Relaxed				Tense		
Relaxed/tense?	1	2	3	4	5	6	7
	Calm				Agitated		
Calm/Agitated?	1	2	3	4	5	6	7
	Restful				Excited		
Restful/Excited?	1	2	3	4	5	6	7

**PART F:**

The following questions are concerned with your beliefs about the threat of drowning. Please **circle the number** which best corresponds to your belief.

	Not at all serious						Very serious
How serious would it be if you were to fall into open water without a life jacket?	1	2	3	4	5	6	7
	Definitely not			Definitely yes			
How likely is it that you might die if you decide to not wear a life jacket during this canoe trip?	1	2	3	4	5	6	7
	Definitely not			Definitely yes			
If I fell in the water during the trip, wearing a life jacket will lower my chances of dying	1	2	3	4	5	6	7
If I fell in the water during the trip, wearing a life jacket will increase my chances of survival	1	2	3	4	5	6	7
If I fell in the water during the trip, wearing a life jacket will keep me alive long enough for someone to rescue me	1	2	3	4	5	6	7
	I know I cannot			I know I can			
Put a life jacket on by myself while on land	1	2	3	4	5	6	7
Put a life jacket on by myself while on a boat	1	2	3	4	5	6	7
Put a life jacket on by myself while in the water	1	2	3	4	5	6	7
Wear a life jacket whenever I go boating	1	2	3	4	5	6	7
Save myself from dying if I fall into the water	1	2	3	4	5	6	7
	Definitely not			Definitely yes			
The benefits of wearing a life jacket outweigh the costs	1	2	3	4	5	6	7
Wearing a life jacket while in the canoe would cause too many problems	1	2	3	4	5	6	7
I am discouraged from wearing a life jacket because I would feel silly doing so	1	2	3	4	5	6	7
	Not at all likely			Very likely			
How likely or unlikely is it that you will wear a life jacket when you're in the canoe?	1	2	3	4	5	6	7
	Definitely not			Definitely yes			
Do you plan to wear a life jacket whenever you're in the canoe?	1	2	3	4	5	6	7

**PART G: Socio-demographic Information:**

*The following questions are designed to let us know more about the participants. Please fill in the blank or place an **X** in appropriate the checkbox.*

1) **What is your age?** \_\_\_\_\_ *years old.*

2) **What is your gender?**

FEMALE                       MALE                       OTHER

3) **What year of university are you in?**

FIRST               SECOND               THIRD               FOURTH               PART-TIME      OTHER: \_\_\_\_\_

4) **How many years have you lived in Canada?** \_\_\_\_\_ *years.*

5) **Now that you've completed the survey, when going boating, what is the likelihood that you will wear a life jacket?** *(please give a number between 0% and 100% where 0% is you never wear a life jacket and 100% is you always wear one.)* \_\_\_\_\_%.

**Thank you for taking the time to complete this survey!**