5.1 OVERVIEW

The research model is based on the Protection Motivation Theory (PMT) (Rogers 1983) and the Elaboration Likelihood Model (ELM) (Petty & Cacioppo 1986). It was developed based on the research objectives and the issues identified in the literature review and exploratory research sections. The model is shown in Figure 5.1 below.

Figure 5.1 Research model
Prospect theory (Kahneman & Tversky 1979) and construal level theory (Trope & Liberman 2003) are used to design the green advertising messages that serve as the sources of information to the PMT framework.

5.2 HYPOTHESES RELATED TO PMT SOURCES OF INFORMATION

Study 1 (Experiment 1) and Study 2 (Experiment 2 and 3) use three different experiments and also use different kinds of factors as source of information for the PMT variables. Study 1 uses temporal framing and geographical proximity of threats to “frame” the threat. Study 2 uses varying threat levels and goal framing to initiate the protection motivation processes. Hypotheses 1-8 are related to the effect of the sources of information on the protection motivation variables. These hypotheses are specific to each of the studies. The rest of hypotheses (Hypotheses 9 – 16) examine the effect of the PMT variables, involvement and environmental knowledge on attitudes and intentions towards green products. These are common to all the two studies.

5.2.1 Framing Temporal and Geographical Proximity of Threat (Study 1: Experiment 1)

This experiment evaluates the effect of temporal and geographical proximity of threat on the protection motivation variables. It also includes the consideration for future consequences – a personality variable that is commonly associated with temporal framing. Figure 5.2 shows the manipulations.
Construal level theory posits that events/issues that are closer in time and space (distance) are more concretely thought of and consequently are considered personally relevant (Trope & Liberman 2003). Temporally closer outcomes and benefits are considered more relevant as they are easier for individuals to visualise (Petty & Cacioppo 1984). Most people tend to discount future outcomes and are concerned with gains closer in time (Green & Myerson 2004). When compared to abstract information regarding a future threat, it is easier to imagine a temporally close threat. Thus, a threat that is closer in time presents a higher perceived risk (Chandran & Menon 2004; Bonner & Newell 2008) and framing the temporal proximity of a health threat (a threat closer in time) greatly increases the risk perception of the health threat.

Optimistic or self-positivity bias is another factor that makes individuals underestimate their vulnerability to the threat. Such a bias makes them believe that the projected risks will not happen to them personally. When threats or risks are presented closer in time, this self-positivity bias or optimistic bias is reduced and people find the threat personally relevant (Gilovich et al 1993; Raghubir & Menon 1998; Chandran & Menon 2004; Yan & Sengupta 2013). Chandran & Menon (2004) found that health risks

Figure 5.2  Study1: Experiment 1- framing a temporally and geographically proximal threat

Consideration for Future Consequences

Framing Temporal and Geographical Proximity of Threat

Protection Motivation Variables

- Consideration for Future Consequences
- Framing Temporal and Geographical Proximity of Threat
- Protection Motivation Variables
presented in “day” terms were seen to be more threatening than risks represented in “year” terms.

Construal level theory also proposes a relationship between spatial distance and mental construal. People interpret spatially close events in a more concrete manner (Fujita et al 2006) and view the information as personally relevant (Trope et al 2007). Green advertising and climate change communications studies show that spatial/geographical distance between an individual and the environmental issue affects their attitude and intentions. Highly proximal environmental issues i.e. local issues are considered more relevant (O’Neill, & Nicholson-Cole 2009; Scannell & Gifford 2011; Chang 2012). Therefore health threats can also be made personally relevant by reducing the geographical distance of the threat and making it local. Based on these tenets, the following hypotheses are proposed:

**H1:** Consumers who view health threats that are closer in time (high temporal proximity) will report higher levels of perceived severity and vulnerability when compared to consumers who view threats that are distant in time.

**H2:** Consumers who view health threats that are closer in geography will report higher levels of perceived severity and vulnerability when compared to consumers who view threats that are distant geographically.

There will be an interaction effect of the independent variables such that:

**H3:** Consumers who view health threats that are closer in time and geography will report higher levels of perceived severity and vulnerability when compared to consumers who view threats that are distant in time and geography.
Temporal orientation is an individual difference that makes people focus their attention either on the past, present or future (Holman & Silver 1998). Of the three dimensions, present and future are commonly used in consumer behaviour studies (Martin et al 2009). This variable plays a significant role in the perception of threat and health risks.

Future oriented consumers try to avert future risks and are more likely to engage in the recommended health behaviour like exercising (Dorr et al 1999) or healthy eating (Joireman et al 2012). Consumer behaviour studies also confirm that the consumer’s temporal orientation can influence message evaluations and intentions (Kees 2010, 2011). High CFC individuals are known to be more attentive to long term risks in health domain (Orbell et al 2004 & Orbell & Hagger 2006; Morison et al 2010). Therefore the following hypothesis is posited:

**H4:** There will be interaction effects of the consumer’s temporal orientation and the temporal proximity of threat. Specifically consumers with higher CFC (future-oriented) will report higher perception of threat severity and vulnerability on viewing threats that are proximal in time when compared to low CFC (present-oriented) consumers.

5.2.2 Goal Framing and Threat Levels (Study 2: Experiment 2 and Experiment 3)

This experiment evaluates the effect of goal frames and threat levels on the protection motivation variables. Figure 5.3 shows the variables that are proposed to be the source of information for the PMT variables. The following hypotheses are proposed based on goal frames and threat levels.
Most PMT studies use threats with different intensities to activate the threat appraisal process. For example, in the low severity conditions, the threat is operationalised as a minor medical problem and in the high severity condition the threat can be portrayed as a mortality risk. Correspondingly, manipulating the probability of the occurrence of the risk significantly increases perceived susceptibility to the threat (Milne et al 2000; Courneya & Hellsten 2001; Milne et al 2002). Threat levels are therefore shown to significantly affect perceptions of severity and vulnerability in a number of studies, such that higher levels of threat produce perceptions of higher severity and vulnerability (Witte & Allen 2000; McKay et al 2004; deHoog et al 2005; Cauberghe et al 2009). Higher threat levels (higher intensity of threat) will therefore produce heightened levels of perceived severity and perceived vulnerability. According to PMT, the cognitive threat appraisal process has an effect on the affective fear arousal (Boer & Seydel 1996; Rogers & Prentice-Dunn 1997; Milne et al 2000; Hartmann et al 2013). Hence the following hypothesis is posited:

**H5:** Consumers who view stronger health threats (i.e. high level of threat) will report higher levels of perceived severity and vulnerability when compared to consumers who view weaker threats (i.e. low levels of threat)
Message framing increases threat perception and has been widely used in fear appeals and health communication studies (Maheswaran & Meyers-Levy 1990). Loss frames highlight the losses incurred when making a choice and therefore are usually messages with negative valence. Goal frames distinguishes the positive consequences (e.g. preventing health hazards) of following a recommended behaviour or the negative outcomes of not following the behaviour (e.g. suffering from health hazards). Negative goal framing produces stronger effects when compared to positive goal frames (Levin et al 1998). People are generally loss averse and therefore experience a loss more intensely than a gain (Tversky & Kahneman 1981; Meyerowitz & Chaiken 1987). When messages are negatively framed, they are thought to constitute higher risk when compared to positively framed messages (Meyers-Levy & Maheswaran 2004). Negative (Loss) frames invoke more cognitive processing when compared to positive (gain) frames and work like fear appeals (O’Keefe & Jensen 2009). In most studies negative frames induce higher threat perceptions. Cox & Cox (2001) found that negative information was more successful in increasing threat perception and therefore was more suitable for risk education. Other studies also report that loss frames tend to increase threat perceptions (van ‘t Riet et al 2008; Janssens et al 2010; Updegraff 2013). Hence, it is posited that:

H6: Consumers who view loss frames will report higher levels of perceived severity and vulnerability when compared to consumers who view gain frames.

Perceived risk considered as a moderator of framing effects (Apanovitch et al 2003; Rothman et al 2003) and is known to interact with frames to produce the required behaviour and intentions (Polyorat et al 2007; Toll et al 2008; Hevey et al 2010). In the case of health behaviour, Rothman & Salovey (1997) believe that perceived risk differs for detection and
prevention behaviour. For instance, to screen for cancer using a prescribed health test (a health detection behaviour), is considered risky as the outcome of the test has a high uncertainty and aversive consequence. On the other hand, using a sunscreen to prevent cancer is considered less risky as the outcome does not bode any immediate knowledge of health risk (O’Connor 2005).

In the case of health-detection behaviour, loss frames are shown to be more effective (Block & Keller 1995; Rothman et al 1999). Alternatively, in the case of the risky preventive behaviour studies gain frames work more successfully. For example, sunscreen usage (Rothman et al 1993) and flossing (Mann et al 2004) are more successful than negative frames.

It is clear that there will be an interaction effect of threat level and framing. Therefore the following hypothesis is posited:

**H7:** There will be an interaction effect of framing and threat levels. Gain frames will have a positive influence on perceived severity and perceived vulnerability when the threat level is high and vice-versa.

Involvement is a known moderator of message framing studies. Negative information gains more attention and therefore results in more effortful processing (Kanouse 1984). Therefore when involvement is high, negative frames increase message processing and are considered more persuasive (Maheswaran & Meyers-Levy 1990). Negatively worded arguments are stronger than positive arguments and this could be the reason for loss-framed messages to be more effective when issue involvement is high (Rothman et al 2006). Kim (2013) found that highly involved individuals expressed positive behavioural intentions to adopt abandoned animals when the message was negatively framed.
Contrastingly Millar & Millar (2000) predicted that since the issue of safe driving was a prevention related issue, gain-framed messages would produce higher levels of persuasion with highly involved individuals. Since this research is also a preventive health behaviour related study the following hypotheses are proposed. Both the enduring involvement and message involvement are considered in the hypotheses:

**H8a:** There will be an interaction effect of frame type and environmental concern on purchase intentions. Specifically consumers who report higher levels of environmental concern will report higher levels of purchase intentions when the message is positively framed (gain-framed) and vice versa.

**H8b:** There will be an interaction effect of frame type and message involvement on purchase intentions. Specifically consumers who report higher levels of message involvement will report higher levels of purchase intentions when the message is positively framed (gain-framed) and vice versa.

Previous studies related to PMT do not provide support for gender differences in risk perception (e.g. Milne et al 2002). However it is known that women are more risk averse when compared to men (Garbarino & Strahilevitz 2004) and a gender gap is also known to exist in environmental threat perceptions (Flynn et al 1994; Bord & Connor 1997). McCright & Dunlap (2011) found that white American males were more likely to deny hazards caused by climate change when compared to women. In a recent survey of 33 countries, Franzen & Vogl (2013) found that women were more concerned about environmental threats than men. Women generate more negative thoughts when presented with a negative goal frame when compared to men (Putrevu 2010). Therefore the following hypothesis is posited:
**H8c:** There will be an interaction effect of frame type and gender on perceived severity, perceived vulnerability and fear. Specifically women will report higher levels of perceived severity, perceived vulnerability and fear when compared to men.

### 5.3 MODEL TESTING USING HYPOTHESES FOR EXPERIMENTS 1, 2 AND 3

#### 5.3.1 Threat, Coping Appraisal and Message Involvement

Perceived severity and perceived vulnerability of the threat are cognitive components that cause fear arousal (Rogers & Prentice-Dunn 1997; Floyd et al 2000; Neuwirth et al 2000). Fear is an intervening variable that is caused by the perception of severity and vulnerability of the threat (Milne et al 2000). Higher levels of perceived severity and perceived vulnerability arouse high negative effect (de Hoog et al 2008). PMT also states that fear will be aroused and coping appraisal is initiated when threats are judged to be sufficiently high (Maddux & Rogers 1983; Boer & Seydel 1996; Milne et al 2000).

Therefore it is hypothesized that:

**H9a:** Perceived severity and perceived vulnerability positively influence fear arousal.

**H9b:** Perceived severity and perceived vulnerability positively influence response efficacy.

**H9c:** Perceived severity and perceived vulnerability positively influence self efficacy.

Perceived risk is usually conceptualized in terms of loss to the consumer (Dowling 1986; Conchar et al 2004) and is one of the antecedents
of involvement (Laurent & Kapferer 1985). Health risk perception (Menon et al 2006) is treated as the risk that causes a higher involvement with the message. Zaichkowsky (1986) has also found that issues like health and children’s future enhance involvement. When consumers are highly involved because of the high perceived relevance of the threat they choose to elaborate the information using the “central” route (Petty et al 1983). Perceived risk is also an antecedent of situational involvement (Bloch & Richins 1983; Richins & Bloch 1986) and hence higher levels of perceived severity and vulnerability of threat will lead to higher levels of involvement. Similarly fear arousal also increases message elaboration (Keller & Block 1996) and subsequently increases systematic processing of the message (de Hoog 2005). In environmental communication studies also, fear has increased effortful processing (Meijnders et al 2001). Cauberghe et al (2009) have explored the effect of the PMT variables and have shown that fear, perceived threat and efficacy components have separate direct effects on message involvement.

Therefore the following hypotheses are proposed:

**H10a:** Higher levels of perceived severity will lead to higher levels of message involvement.

**H10b:** Higher levels of perceived vulnerability will lead to higher levels of message involvement.

**H10c:** Higher levels of fear will lead to higher levels of message involvement.

**H10d:** Higher levels of response efficacy will lead to higher levels of message involvement.

**H10e:** Higher levels of self efficacy will lead to higher levels of message involvement.
When people perceive low levels of self-efficacy they tend to avoid the decision or choice (Bandura 1977) as only higher levels of perceived self-efficacy increases their confidence in averting the threat (Bandura 1982; Beck & Frankel 1981; Prentice-Dunn & Rogers 1986; Schwarzer & Fuchs 1995). In health research, self-efficacy is known to increase the adoption intentions of the recommended behaviour (Maibach & Murphy 1995). Self efficacy is also a significant predictor of preventive health behaviour like cancer prevention (Luszczynska 2004), nutrition and dietary changes (Kreausukon et al 2012) and exercise behaviour (Gaston & Prapavessis 2012).

Response efficacy is the belief that the recommended action will avert the threat. This construct is also positively related to preventive health action like cancer prevention (Boer & Seydel 1996). Response efficacy induces the belief that the prescribed action is helpful in successfully averting the threat (Floyd et al 2000). It has been shown to be a key persuasive component in increasing message acceptance and reducing message rejection (Lewis et al 2010).

Therefore it is hypothesized that:

**H11a:** Higher levels of response efficacy lead to higher levels of attitude towards the advertisement.

**H11b:** Higher levels of self efficacy lead to higher levels of attitude towards the advertisement.

Both the coping appraisal components are negatively related to maladaptive responses (Rippetoe & Rogers 1987; Tanner et al 1989) and therefore predict positive responses and intentions. Milne et al (2002) show that coping appraisal variables affect behavioural intentions more consistently when compared to threat appraisal components. A number of researchers have confirmed this effect as response efficacy and self efficacy were important
predictors of behavioural intentions in health and nutrition related studies (Neuwirth et al 2000; Courneya & Hellsten 2001; Cox et al 2004) or information security studies (Lee 2011). Efficacy measures are also related to attitudes as the outcome of fear arousal is typically message acceptance that is treated as attitude, intention or behaviour change (Witte 1992). Therefore it is hypothesized that:

**H11c:** Higher levels of response efficacy lead to higher levels of purchase intention

**H11d:** Higher levels of self efficacy lead to higher levels of purchase intention.

### 5.3.2 Environmental Knowledge and Threat Perception

Prior knowledge has different relationship with involvement and perceived risk. It has also been shown that consumers with low levels of knowledge typically perceive higher levels of risk in different domains as knowledge has a negative relationship with perceived risk (Laroche et al 2003). Consumers who had low levels of knowledge perceive higher levels of risk in decision making (Heilman et al 2000; Klerch & Sweeney 2007). Prior knowledge is known to lower the effect of fear arousal (Averbeck et al 2011). Therefore it is posited that:

**H12a:** Consumers’ environmental knowledge will negatively influence perceived severity of threat

**H12b:** Consumers’ environmental knowledge will negatively influence perceived vulnerability of threat

**H12c:** Consumers’ environmental knowledge will negatively influence fear
On the other hand elaboration is dependent on motivation and ability to process information. People with higher levels of knowledge tend to scrutinise the message carefully to judge it (Maheswaran & Meyers-Levy 1990). Prior product knowledge is shown to be important determinants of message involvement in previous studies (Laczniak et al. 1999). Consumers with low-levels of knowledge rely on heuristic cues whereas knowledgeable consumers have higher levels of elaboration (Alba & Hutchinson 2000). Therefore consumer knowledge can positively impact message involvement (Rucker & Petty 2006). Therefore it is hypothesized that:

**H12d:** Consumers’ environmental knowledge will positively influence message involvement.

### 5.3.3 Involvement, Attitudes and Purchase Intention

Involvement is known to increase elaboration and serve as the mediating variable that determines the extent of influence of the advertisement on an individual (Petty & Cacioppo 1986). Attitude towards advertisement (Aad) is defined as “a predisposition to respond in a favorable or unfavourable manner to particular advertising stimulus during a particular exposure occasion” (Lutz 1985). According to the dual mediation hypothesis - attitude related cognitions affect the attitude towards the advertisement, brand and in turn behaviour related purchase intentions (MacKenzie et al. 1986; Teng et al. 2007). Most advertising studies have also shown that attitude towards advertising has a strong influence on attitude towards the brand under high involvement conditions (Gardner 1985; Park & Young 1986; Muehling & Laczniak 1988).

Enduring involvement is considered a predictor of situational involvement (Moorman et al. 2012). Message involvement is known to influence attitude towards advertisement in the positive direction and attitude
towards advertisement produces significant immediate and delayed effects on attitude towards brand (Muehling & Laczniak 1988; Laczniak & Muehling 1993a; Lee 2000). When message involvement is high, individuals increase their processing effort (Laczniak et al 1989) and consequently this plays a huge role in brand attitude formation (Muehling et al 1991). Message involvement therefore predicts attitudes as thoughts are evaluated in a detailed manner (Maheswaran & Meyers-Levy 1990) and also determines the accessibility of brand attitudes (Kokkinaki & Lunt 1999). Similarly issue involvement activates message elaboration and therefore involvement with the message (Maheswaran & Meyers-Levy 1990).

Therefore since message involvement and involvement with the environment (environmental concern) increase elaboration, these variables consequently increase consumers’ central processing of brand attitude and in turn purchase intentions (Petty & Cacioppo 1986). Again, it is known that a positive relationship between attitude towards the advertisement, brand and purchasing intention exists as confirmed by a number of studies in congruence with the dual mediation hypothesis. Based on the discussion above, the following hypotheses are proposed:

**H13a:** Environmental concern (Enduring involvement with the environment) positively influences message involvement.

**H13b:** Environmental concern (Enduring involvement with the environment) positively influences attitude towards the ad.

**H13c:** Environmental concern (Enduring involvement with the environment) positively influences purchase intentions

**H14:** Message involvement positively influences attitude towards advertisement.
H15: Attitude towards the advertisement positively influences attitude towards brand.

H16: Attitude towards brand positively influences purchase intention.

The hypotheses were formulated based on the variables identified during the review process and the results of the qualitative process. Situational involvement is measured as involvement with the message and environmental concern is treated as enduring involvement with the environment. Hypotheses H13 - H16 test the effect of involvement with attitudes and intentions. The rest of the hypotheses are related to the effect of framing, environmental knowledge and the PMT variables. Experiments were used to test the hypotheses.