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Unintended Effects of Fear Appeals: The Role of Stage of Change, Threat, and Efficacy

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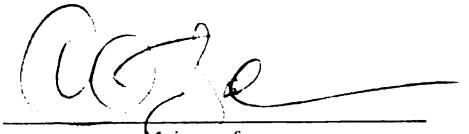

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UNINTENDED EFFECTS OF FEAR APPEALS: THE ROLE OF STAGE OF CHANGE, THREAT, AND EFFICACY

By

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ABSTRACT

UNINTENDED EFFECTS OF FEAR APPEALS:
THE ROLE OF STAGE OF CHANGE, THREAT, AND EFFICACY

By

Hyunyi Cho

Doing social good, the conscious intention of health communication campaigns, may produce unanticipated, and sometimes adverse, consequences. Campaign messages using fear appeals, in particular, have long been recognized for their potential to induce unintended effects, including the initiation of risky behaviors. While attempting to "do good," health communication campaigners need to examine possible unintended effects as well as intended effectiveness to keep their ethical mandate to "do no harm."

The present study represents an attempt to identify and investigate the conditions under which unintended effects of fear appeals are likely to occur. Specifically, the roles of stages of change, threat, and efficacy in producing unintended effects of fear appeals were examined. These unintended effects include defensive avoidance, message derogation, perceived manipulation, fatalism, hopelessness, reactance, and wishful thinking. The extended parallel process model and the transtheoretical model were used as theoretical frameworks. A lab experiment (n=274) was conducted to examine college students' reactions to fear appeals used in skin cancer prevention messages. Threat was manipulated in two (high, low) levels. Behavior was measured in a four-week follow-up.

The results indicated that in general, unintended effects of fear appeals are more likely to occur in individuals in earlier stages of change than later stages of change.

While perceived threat energized both intended and unintended effects of fear appeals, lack of efficacy among individuals in earlier stages of change largely rendered unintended effects more conspicuous than among others.

After being exposed to fear appeal messages, college students who had not intended to engage in skin cancer prevention reported greater likelihood of avoiding the thoughts of skin cancer and its prevention, being fatalistic about the threat of skin cancer, feeling hopeless, and perceiving that the messages were constraining their behavioral freedom, than those who had intended to engage in or who had engaged in behavior for skin cancer prevention. Concurrently, those who had not contemplated behavioral changes for skin cancer prevention indicated less favorable attitude toward message recommendations, fewer intentions to engage in preventive behavior, and fewer changes in behavior, than those who had contemplated or had engaged in skin cancer prevention.

If those who do not engage or who do not intend to engage in preventive behavior are the major intended audience of health communication campaigns and need communication campaigns most, the results of this study hold significant implications and challenges for message designers. The results suggest that those in greatest need of communication campaigns may be the most likely to exhibit unintended effects and least likely to respond with intended changes when being exposed to health communication messages using fear appeals. Moreover, fear appeal messages are likely to be more effective in reinforcing those who already plan or engage in preventive behavior than persuading those who have yet to initiate changes toward prevention.

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My parents made everything possible, including this wonderful venture to America.

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CHAPTER 1

INTRODUCTION

Health communication campaigns are social practices (Salmon, 1989, 1992). Influencing a large number of individuals' beliefs, attitudes, and behavior (Rogers & Storey, 1987), health communication campaigns constitute an agent of social change (Kotler, 1978; Paisley, 1981). Concomitantly, they represent an outcome of social process in which conflicting values and powers are negotiated (Rakow, 1985; Guttman, 1996; 1997).

That social practices entail multiple functions was first noted by Merton (1957). Pointing out that conscious intentions of social practices are independent of objective outcomes, Merton suggested that manifest and latent functions of social practices be distinguished. The former refers to "those objective consequences for a specified unit which contribute to its adjustment or adaptation and were so intended, while the latter refers to "unintended and unrecognized consequences of the same order" (p. 63). In this light, Salmon (1989) argued that effectiveness, those outcomes intended by the campaigner, be distinguished from effects, outcomes including unexpected ones, in the evaluation of health communication campaigns.

Unanticipated consequences have been studied, although not explicitly, in a broad range areas, such as medicine (e.g., Barsky, 1988a; 1988b; Illich, 1976; McKeown, 1979; Nesse & Williams, 1994; Sagan, 1987; Tenner, 1996), environmental control (e.g., Burton, Kates, & White, 1993; McPhee, 1989; Wijkman & Timberlake, 1984),

computerization (e.g., Kling, 1995; Weizenbaum, 1976; Zuboff, 1984), and interpersonal (e.g., Mortensen, 1997) and mass communication (see examples below).

In the domain of medicine, for example, researchers have noted the paradoxical effects of the improvements of the nation's health status. The advances in life expectancies, mortality rates, treatments, and preventive measures were not always accompanied by the enhancement of the public's perceptions of their own health (Barsky, 1988a; 1988b; Illich, 1976; Tenner, 1996). This discrepancy, aptly described as "the failure of our success" (Barsky, 1988b, p. 415) and "doing better but feeling worse" (Wildavsky, 1977, p. 105), is attributed to factors such as the following.

Progress in medical care has decreased the mortality of acute diseases. This accomplishment, however, came at the cost of relative increases in chronic diseases. Concurrently, the promotion of health and health-consciousness has undermined the public's perceived health status by rendering them overly sensitive to symptoms and feelings of illness (Barsky, 1988a; 1988b; Mechanic, 1983; Miller, Murphy, & Buss, 1981; Pennebaker, 1982).

Undesirable consequences have also been investigated in media effects research, focusing mainly on the areas of commercial advertising and entertainment content (Brown & Walsh-Childers, 1994; McGuire, 1988). The examination of the unfavorable effects of commercial advertising has focused on issues involving special audience such as children (e.g., Adler, Lesser, Meringoff, Robertson, Rossiter, & Ward, 1980; Comstock & Paik, 1991; Kunkel & Gantz, 1992; Wartella, Heintz, Aidman, &

Mazzarella, 1990) and long term changes in values and culture (e.g., Holbrook, 1987; Pollay, 1984; 1986a; 1986b; 1987).

A wealth of research has been done on the effects of entertainment program. This line of research may technically not be considered as one on "unintended" effects because intentions of entertainment programs may not be as clearly defined as planned social actions such as health communication campaigns, or the intentions may be widely divergent (e.g., to make money vs. to frighten). Nonetheless, the inauspicious nature of their effects has received much attention from both researchers and the general public. Studies have focused on violence on viewer aggression (e.g., Bandura, Ross, & Ross, 1963; Berkowiz, 1984; Gerbner, Gross, & Signorielli, 1980; Phillips, 1983), portrayal of minorities on viewer stereotyping (e.g., Armstrong, Neuendorf, & Brentar, 1992; Atkin, Greenberg, & McDermott, 1983; Elliot & Byrd, 1983), and erotic content on sexual attitude and behavior (e.g., Donnerstein, Linz, & Penrod, 1987; Greenberg, Brown, & Buerkel-Rothfuss, 1993; Zillmann & Bryant, 1982; 1984) (McGuire, 1988).

Unintended effects can be either positive or negative. For example, in response to opponents' criticism that children's advertising promotes materialism, proponents contended that advertising can help children be familiarized with the values of the real world (Belch & Belch, 1995). However, research has tended to focus on negative consequences, perhaps in recognition of the public's attention and the need of social intervention.

Yet, health communication campaigns, due to their manifest intent to do good rather than harm, have been underexamined for their possible adverse effects. Salmon

(1996) offered initially a compilation and typology of unintended effects of health communication campaigns. The next section presents a review of his typology, which is summarized in Tables 1a and 1b.

Table 1a
Typology of Unintended Effects of Health Communication Campaigns: Predominantly Individual-Level, Direct, Short-Term, and Content/Target Specific

Unintended Effects	Definitions	Examples
Obfuscation	Confusion and misunderstanding of messages.	Lerman, Rimer, Trock, Balshem, & Engstrom, 1990; Roberts, Imrey, Turner, Hosokawa, & Alster, 1986
Dissonance	Psychological discomfort and distress provoked by the incongruence between recommended health state and audience' actual state.	Guttman & Zimmerman, 1996; Witte, 1992a; Witte & Morrison, 1995a
Iatrogenic	Deleterious effects of therapeutic treatment causing new pathology independent of the old.	Becker, 1993; Burgo & Perez, 1986; CANDI, 1990; Pavich, 1986; Worth & Rodriguez, 1987; Wyatt, 1988
Boomerang	The phenomenon in which audience respond to the opposite way recommended by a message	Blood & Snyder, 1993; Feingold & Knapp, 1977; Kraus, Riggins, & Franti, 1975; Reinarman & Levine, 1995; Snyder & Blood, 1992; Stuart, 1974
Stigmatization	The phenomenon in which every action intended by a campaign brings about equal and opposite reaction.	Kolata, 1992; Levine, 1991; Salmon, 1996; Wang, 1992

Table 1b
Typology of Unintended Effects of Health Communication Campaigns
Predominantly Institutional-Level, Indirect, Long-Term, and
Content/Target Diffuse

Unintended Effects	Definitions	Examples
Epidemic of Apprehension	The phenomenon in which the pervasiveness of fear appeals over the long term produce unnecessary consciousness and concern over health.	Barsky, 1988a; 1988b; Becker, 1993; Illich, 1976; McKeown, 1979; Mechanic, 1983; Miller, Murphy, & Buss, 1981; Pennebaker, 1982
Desensitization	Narcotizing dysfunction of the mass media which induces desensitization toward health issues.	Becker, 1993; Downs, 1972; Lazarsfeld & Merton, 1951; Middlestadt, 1991
Culpability	The phenomenon of locating the causes of problems within the individual, rather than in social and structural conditions.	Guttman, 1997; Middlestadt, 1991; Milio, 1981; Minkler, 1990; Paletz, Pearson, & William, 1986; Salmon, 1989; Wallack, 1989
Social Reproduction	The phenomenon in which campaigns reinforce existing social inequities.	Ball-Rokeach, Grube, & Rokeach, 1981; Fairly, Haddad, & Brown, 1996; O'Keefe, 1971; Salmon, Wooten, Gentry, Cole, & Kroger, 1995; Vidmar & Rokeach, 1974
Enabling	The phenomenon in which defining a condition as a matter of public health produce and promote industries.	Barsky, 1988a; 1988b; DeJong & Wallack, 1992; Fischer, Richards, Berman, Krugman, 1989; Glanz, 1996
Opportunity Cost	The phenomenon in which emphasis on individual responsibilities impede the progress in public health through structural change.	Alonzo, 1985; Antonovsky, 1995; Becker, 1993; Cassel, 1976; Faden & Faden, 1978

Unintended Effects of Health Communication Campaigns

Before reviewing the types of unintended effects, a discussion of sources of such effects may be necessary. Unlike efficacy, "the level of desired effect of a program when delivered and received under optimum conditions" (Flay, 1986, p. 468), effects of health communication campaigns are determined by a confluence of factors operating in the real world. Flay (1986, p. 468) stated that effectiveness or intended effects refer to "the level of good over harm that a program achieves when received under typical real-world conditions of availability and acceptance." So do unintended effects.

Therefore, sometimes inadequacies or lack of the factors that produce intended outcomes may create unintended effects. For example, error in audience segmentation or insufficient formative research can result in unanticipated consequences. Next, unlike commercial messages, the placement of public health messages tend to not be under control of the campaign planners. In this case, good segmentation and formative research lose their effectiveness by being delivered to an unintended audience (Salmon, 1996).

According to Salmon (1996), however, there are other factors that make unique contributions toward unintended effects. Dogmatism, by driving actions strictly out of principle without regard for consequences for others (Merton, 1957), tends to produce distress among marginalized, such as the smokers. These unintended effects can be largely categorized into either individual/short-term level or societal/long-term level (Salmon, 1996).

Individual/Short-Term Level

Obfuscation. One of the unintended effects of health communication campaigns observed at individual level includes obfuscation, misunderstanding and subsequent misguided behavior. For example, messages designed to reduce unnecessary physician visits resulted in reductions in necessary visits among African-Americans and Medicaid patients (Roberts, Imrey, Turner, Hosokawa, & Alster, 1986).

Dissonance. Dissonance is another type unintended effects occurring at individual level when recommended health state and audience' actual state are incongruent. Guttman and Zimmerman (1996) found that in the face of health education messages promoting breast feeding and the society's disapproval of breast feeding in public, infants-raising women felt guilty, deprived, and were frustrated.

Boomerang. Boomerang effects, in which audience react to the opposite way recommended by a message, have long been recognized in various persuasion contexts, including fear appeals in health communication. After being exposed to fear appeals, audience reported reduced level of worry about risk (Stuart, 1974), less negative attitude toward risk behavior (Feigngold & Knapp, 1977; Snyder & Blood, 1992), stronger intentions to engage in risk behavior, and increased risk behavior (Stuart, 1974; Witte, 1992a).

Iatrogenic. The term "iatro" is the Greek word referring "physician," and "genesis" is "origin." Illich (1976) used this word to refer to adverse clinical, social, and cultural impacts created by the medical establishment. Salmon (1996) used the term "iatrogenic" to refer to unintended effects of health communication campaigns

engendering new pathology. For example, Kaplan (1985) reported that while dietary changes were associated with reduced mortality of heart disease, this decrease was related to increases in the mortality of cancer.

Stigmatization. Health communication messages that attempt to scare audience with possible consequence of disabilities may foster stigmatization (Wang, 1992). Wang argued that by suggesting that disabilities are undesirable, messages such as the following can render the perceptions toward the disabled as negative: "If you think seat belts are confining, think about a wheelchair;" "Last year, 1057 teenagers got so drunk they couldn't stand up. Ever" (p. 1099).

Societal/Long-Term Level

Over time, unintended effects of health communication campaigns may become cumulative and render changes in societal level (Salmon, 1996).

Epidemic of apprehension. The ubiquity of messages about health risks are considered to have created a climate of fear (Becker, 1993; Tenner, 1996). This phenomenon, which Thomas (1983) termed as "an epidemic of apprehension," may undermine public's sense of and well-being by raising consciousness and concern over health unnecessarily high. Sense of insecurity produced by such messages may make the public perceive that health risks "lurk in every aspect of daily life: the air we breathe, the water we drink, the food we eat, the homes we live in, the substance we touch, and the work we do" (Feinstein & Esdaile, 1987, p. 113). Further, Feinstein and Esdaile (1987) suspected that such unnecessary fear, often aroused by messages lacking credible and

rigorous scientific standards, has generated proposals for changes in policies for health, nutrition, and industrial safety.

Desensitization. Another type of unintended effects of health communication campaign that occur over long-term at societal level is desensitization. Larzasfeld and Merton (1951) predicted that over time, increasing exposure to campaign messages about health issues may inadvertently render the public apathetic toward such issues. Empirically, Kinnick and others' (1996) study of compassion fatigue found that long-term, diffusive media coverage was linked to desensitization and emotional burnout toward issues including AIDS, homelessness, child abuse, and violent crime.

Culpability. By stressing individual responsibility, health communication campaigns have fostered the tendency to locate the causes of illnesses and diseases within individual. As a result, campaigns located culpability in individuals, instead of social, economic, political, and cultural systems that may determine an individuals' health status to a greater degree (Guttman, 1997; Milio, 1981; Paletz, Pearson, & William, 1986; Rakow, 1989; 1997; Salmon, 1985; 1989; Wallack, 1989).

Social reproduction. Outcomes of health communication campaigns tend to reinforce existing social inequities. For example, a 1995 study on the public's AIDS knowledge found that low education group had lesser knowledge on both true- and false-transmission of AIDS than the high education group (Salmon, Wooten, Gentry, Cole, & Kroger, 1995).

Enabling. Health issues that are communicated in campaigns tend to enable industries including food, condom, charity, medicine, and social marketing (Salmon,

1996). Designated driver campaign was embraced by and enabled the alcohol industry by encouraging non-drivers' drinking and blurring attention on other issues such as underage drinking (DeJong & Wallack, 1992). Similarly, stop underage smoking campaign enabled the tobacco industry, by implying that a cigarette is an "illicit pleasure," "declaration of independence," and "self-identity" (Glantz, 1996, p. 156).

Opportunity cost. To the extent that health communication campaigns stress individual responsibilities, opportunities to change individuals' socioeconomic environments which have direct relationship with their health status may be lost (Alonzo, 1985; Becker, 1993; Cassel, 1976; Faden & Faden, 1978; Ferudenberg, 1981; Mechanic, 1988; Slater & Carlton, 1985).

Of Salmon's (1996) typology, three categories particularly pertain to unintended effects of fear appeals: "boomerang," "dissonance," and "epidemic of apprehension." And the fear appeal is one of the message strategies in health communication campaigns that has most often been recognized for its unintended consequences. In this context, this study focuses specifically on the identification and investigation of the conditions under which unintended effects of fear appeals are likely to occur. The next section discusses each of the unintended effects of fear appeals in detail. Table 2 offers a summary.

Unintended Effects of the Fear Appeal

One of the earliest studies on unintended effects of fear appeals is Johns Hopkins University researchers' work on the impact of motion pictures used for venereal disease control (Lashley & Watson, 1929). Specifically, Lashley and Watson were concerned that fear appeals in such motion pictures may elicit a phobia encumbering intended

outcomes. The results of the study did not find support for this hypothesis. Lashley and Watson surmised that fear arousal was not intense enough to trigger any unintended effects. Over the years, however, studies of fear appeal have reported a range of unintended effects that can be summarized into either boomerang or dissonance in Salmon's (1996) typology.

Boomerang

Boomerang effects of fear appeals were observed in audience' attitude, intentions, and behavior. Hovland et al. (1953) and Witte (1992a) suggested and documented other types of negative reactions to fear appeals that may bring about boomerang effects: defensive avoidance, message derogation, and perceived manipulation. The following sections discuss each of these effects.

Attitude. For example, after exposure to anti-drug abuse public service announcements, attitudes toward amphetamines changed significantly less negative than prior to exposure (Feingold & Knapp, 1977). College students' attitude toward drinking became less negative after being exposed to alcohol warning labels (Blood & Snyder, 1993; Snyder & Blood, 1992). Similarly, results of a drug education found that participants significantly reduced their worry about drugs in general than non-participants (Stuart, 1974).

Intentions. English smokers indicated stronger intentions to smoke after being exposed to cigarette warning labels (Hyland & Birrell, 1979). Rogers et al. (Kleinot & Rogers, 1982; Rogers & Mewborn, 1976) found that high threat messages, when coupled with low response efficacy, increased intentions to smoke or drink.

Behavior. Stuart (1974) found that participants of a drug education significantly increased the purchase of marijuana and LSD than non-participants (Stuart, 1974). Witte (1992a) found that when perceived efficacy was low, threatening messages prompted individuals to engage in unprotected sex more often.

Defensive avoidance. After being exposed to a fear-arousing message, individuals attempt to avoid the thoughts and communications of risk and prevention presented in the message. While some researchers cast doubt on defensive avoidance hypothesis, others' contention that lack of evidence stems from ethical consideration delimiting the upper bound of fear manipulation is shared by many (see Mongeau, 1995). Janis and Feshbach (1953) first suggested defensive avoidance as an unintended effect of threat messages, and McCrae (1984) identified avoidance as a coping mechanism that particularly deals with threat. Defensive avoidance can be most notable type of unintended effects of fear appeals because it was inversely related to attitude, intentions, and behavior (Rippetoe & Rogers, 1987; Witte, 1992a).

Message derogation. When perceived threat is high, individuals express dislike of the message and its presenter. Witte (1992a) found that message derogation was negatively related to intended attitudes.

Perceived manipulation. When perceived threat is high, individuals tend to perceive that the message is deliberately trying to scare them. This type of reaction has been reported in many fear appeal studies including Janis and Feshbach's (1953), Leventhal, Singer, and Johns' (1965), and Witte's (1992a).

Dissonance

Rippetoe and Rogers (1987) adopted McCrae's (1984) coping mechanism, fatalism, hopelessness, and wishful thinking, to better understand maladaptive responses to threatening messages. These reactions can be best categorized as a form of dissonance in Salmon's (1996) typology. Rippetoe and Rogers found that they occur when the levels of perceived threat and efficacy are incongruent (i.e., when threat was high but efficacy was low). Whether these reactions are linked to boomerang effects has yet to be determined.

Fatalism. Researchers have suggested (Casey, 1995) and found (Rippetoe & Rogers, 1987) that fatalism may obstruct intended effects of fear appeal messages. In fatalistic reactions, instead of thinking about and acting upon ways to avert a possible threat, individuals accept it as given and engage in non-action. Rippetoe and Rogers reasoned that fatalism may be most unsalutary because by accepting the threat, the individuals do not engage in any type of coping responses to threat at all.

Hopelessness. If fatalism is a result of lack of belief in message recommendations, hopelessness is more likely to be an outcome of lack of confidence in one's ability to perform recommended behavior (Rippetoe & Rogers, 1987). Rogers (1983) described this reaction as "posture of resignation and helplessness" (p. 477).

Wishful thinking. Hovland et al. (1953) suggested that when message recommendations are perceived to be not efficacious, a highly likely threat may motivate individuals to form "magical" or "wishful" thoughts. McCrae (1984) found wishful thinking as a coping reaction to threat. Specifically, subjects wished that a miracle would

happen, they could change the past, and the threat would go way. Rippetoe and Rogers (1987) found highly threatening message on breast cancer elicited wishful thought among those who perceived low efficacy of breast self examination.

Table 2 Unintended Effects of Fear Appeals

Unintended Effects	Definitions	Examples
Defensive avoidance	Avoidance of exposures to thoughts and communications about threat after being exposed to fear appeal messages (Hovland et al., 1953).	Janis & Feshbach, 1953; Fruin et al., 1991; Schafer et al., 1993; Witte, 1992a; Witte & Morrison, 1995a
Message derogation	Dislike of communication and complaints about the content (Hovland et al., 1953).	Witte, 1992a; Witte et al., 1998
Perceived manipulation	Belief that the communicator is deliberately attempting to scare them (Hovland et al., 1953).	Witte, 1992a, Witte et al., 1998
Fatalism	The acceptance of a stressful situation as unchangeable and complacency in the face of danger because nothing can be done (Rippetoe & Rogers, 1987, p. 598).	Fruin et al., 1991; McCrae, 1984; Rippetoe & Rogers, 1987; Schafer et al., 1993
Hopelessness	Learned helplessness resulting from absence of belief in possible solutions to a threat (Rippetoe & Rogers, 1987, p. 598).	Fruin et al., 1991; McCrae, 1984; Rippetoe & Rogers, 1987
Wishful thinking	A response that prompts the use of panaceas or unrealistic solutions to a problem (Rippetoe & Rogers, 1987, p. 598).	Hovland et al., 1953; Fruin et al., 1991; McCrae, 1984; Rippetoe & Rogers, 1987

Table 2 (cont'd).

Unintended Effects	Definitions	Examples
More favorable attitude toward risk behavior	Overall evaluation of the behavior that involves health threat in a positive manner.	Feingold & Knapp, 1977; Blood & Snyder, 1993; Snyder & Blood, 1992
Less favorable attitude toward recommended behavior	Overall evaluation of the behavior that reduces health threat in a negative manner.	Witte, 1992a
Increased intention to engage in risk behavior	Expression of a greater degree of intention to engage in behavior that involves health threat.	Hyland & Birrell, 1979; Kleinot & Rogers, 1982; Rogers & Mewborn, 1976; Witte, 1992a
Counter-productive behavior	Engagement in behavior that involves health threat more frequently or to a greater degree.	Witte, 1992a

The understanding of health communication campaign effects will not be complete when efforts are confined to the evaluation of intended outcomes. Investigation of unintended effects is particularly important for health communication campaigners because they have an ethical mandate to "do no harm" even while attempting to "do good" (Wang, 1992).

Because of the prominence of fear appeals illustrated above, the present study attempts to identify and investigate the conditions under which unintended effects of fear appeals may occur. The extended parallel process model (EPPM) and the transtheoretical

model (TM) were used as theoretical frameworks. A lab experiment (n=274) was conducted to examine college students' reactions to fear appeals used in skin cancer prevention messages. Threat was manipulated in two (high, low) levels. Behavior was measured in a four-week follow-up.

This study is organized into four chapters. Chapter one introduced unintended effects of health communication campaigns and fear appeals. Chapter two reviews the literature on fear appeals, focusing on their unintended effects. Chapter three describes the method of this study. Chapter four presents the results of this study. Chapter five discusses the findings and their implications. It also presents the limitations of this study. The appendices include informed consent form, high and low threat messages, and measures.

CHAPTER 2

LITERATURE REVIEW

This chapter begins by discussing the definition of the fear appeal and theoretical approaches to the unintended effects of the fear appeal. Drive, expectancy-value, psychological reactance, and parallel-process models including the EPPM are discussed. Next, this chapter describes the TM, a stages of change model, and how it relates to the EPPM. Finally, it concludes by presenting hypotheses and research questions.

Defining the Fear Appeal

Fear has been part of human condition, and the fear appeal shares equally long history. For example, the Bible abounds with fear appeals: "...but you must not eat from the tree of the knowledge of good and evil, for when you eat of it you will surely die" (Genesis 2: 17). Death in this passage represents a key construct of the fear appeal which researchers have termed "unfavorable consequences" (Hovland, Janis, & Kelley, 1953), "magnitude of noxiousness" (Rogers, 1975), or "severity" (Witte, 1992b). However, fear as persuasion tool has not been systematically studied until the early 1950s by Yale school of psychologists led by Janis. Interestingly, Janis' (Janis & Feshbach, 1953) seminal work on fear appeals focuses on their unintended and adverse effects of fear appeals.

What is fear, and what is the fear appeal? What makes the fear appeal so notorious for generating unintended effects, but still so prevalent in many communication contexts including public health? Fear is a form of strong, negative affect (Fiske &

Taylor, 1991). Appeals refer to those that motivate individuals to comply to message recommendations (Hovland et al., 1953). An obvious corollary is that fear appeals are those that motivate individuals to comply to message recommendations through the arousal of fear.

However, a look at theories of the fear appeal makes one wonder if the definition above correctly describes the fear appeal. Fear has faded away from the discussion of fear appeals (see next section on Rogers, 1975; 1983) after Janis' work. Researchers argued that motivation comes from the thoughts on threat, rather than the emotion of fear. Fear has been reinstated recently, but still does not play a central role in inducing intended effects of health communication campaigns (see next section on Witte, 1992b; 1994; 1998).

To put the fear appeal in perspective for this study, a review of fear appeal theories and their explanations for unintended effects is in order.

Theoretical Approaches to the Unintended Effects of the Fear Appeal

In general, four major theoretical approaches have been used to explain unintended effects of fear appeals: drive, expectancy-value, psychological reactance, and parallel process. Researchers (Boster & Mongeau, 1984; Dillard, 1995; Hale & Dillard, 1995; Witte, 1992b; 1998) have usually classified fear appeal theories into three major categories: drive, expectancy-value, and parallel-process models. In addition to these major theoretical frameworks for fear appeals, psychological reactance (Brehm, 1966) has also been used to explain unanticipated effects of fear appeals.

Drive Models

The seminal work on unintended effects of fear appeals was done by Janis and his colleagues (Janis, 1967; Janis & Feshbach, 1953; Hovland, Janis, Kelly, 1953). In their studies, unintended as well as intended effects of fear appeals are explained in terms of drive. Drive, the key construct of learning theory, refers to "emotional tension" (p. 78).

Hovland et al. (1953) used the term "threat appeal" to refer to a motivational message portraying "negative consequences" of noncompliance to message recommendations. They expected that such messages will arouse varying degrees of fear. The experience of fear then elicits drive which motivates individuals to engage in behaviors to reduce the drive. Therefore, the greater the fear, the greater compliance to message recommendations.

However, Janis and Feshbach's (1953) experiment found a negative and linear relationship between the level of fear and compliance to message recommendations on dental hygiene. Subsequently, Janis and Feshbach hypothesized three conditions under which intended effects of fear appeals may be hampered and defensive reaction and therefore unintended effects may occur instead: when the intense experience of fear renders individuals (1) fail to attend to messages and (2) be aggressive toward message presenters, and (3) avoid thoughts and communications about risks presented in messages after exposure.

The hypothesis about defensive avoidance was supported, but the ones about inattentiveness and aggression toward communicator were not. As a result, Janis and Feshbach (1953) argued that avoidance of message cues after exposure will occur when

emotional tension aroused by high level of fear is not sufficiently reduced. A factor that may reduce the tension, according to Janis and Feshbach, is reassurance which may come either from the self or message recommendations. To be more specific, Hovland et al. (1953) predicted that unintended effects will occur when message recommendations are perceived to be ineffective in deterring the threat or to be "impossible to carry out" (p. 77). A seed of thoughts about the role of self and response efficacy are found here.

Later, Janis (1967; Hovland et al., 1953) proposed a curvilinear hypothesis. According to this hypothesis, as the level of fear increases, compliance to message recommendation increases up to an optimal point. After reaching this point, compliance decreases and defensive reactions becomes prominent, formulating an inverted-U shape curve of compliance as a function of fear. The hypothesis was criticized by Leventhal (1970), Rogers (1975; 1983), and Beck and Frankel (1981) for many reasons including its post-hoc, unfalsifiable nature. Most of all, this curvilinear hypothesis is at odds with the results of Janis' (Janis & Feshbach, 1953) earlier experiment which found negative and linear association between fear and compliance (Hale & Dillard, 1994).

Expectancy-Value Models

Expectancy-value theories posit that behavior is determined by an individuals' strength of expectations about consequences of behavior and the value that one assigns to the consequences (e.g., Rotter, 1954). This theoretical approach has been adopted to explain and predict health-related behavior.

Protection motivation theory. Roger's (1975; 1983) original and revised protection motivation theory (PMT) represents an expectancy-value approach to fear

appeals. These models depart from Janis' drive approach because they propose that compliance to message recommendations is an outcome of cognitive processes, rather than emotional tension. Rogers (1975) contended that protection motivation, which induces changes in attitude and behavioral intention, is the result of cognitive appraisal. Thus, although Rogers called his PMT as a "theory of fear appeals," fear was absent in his prediction of intended attitude change.

From this perspective, Rogers (1975) first delineated three key components of fear appeals, magnitude of noxiousness, probability of occurrence, and efficacy of recommended response. These variables of the PMT work in a multiplicative manner to elicit protection motivation and intention to comply to message recommendations. Explanations for possible adverse effects of fear appeals were not included in the original PMT.

Studies testing the original PMT found unintended effects resulting from interactions between noxiousness or probability of threat and response efficacy (Kleinot & Rogers, 1981; Rogers & Mewborn, 1976). When response efficacy was low, increases in probability and/or noxiousness of threat induced greater intention to engage in risk behavior, such as smoking and drinking.

Perhaps because of these findings, Rogers (1983) repostulated the original PMT. New variables, including self efficacy, intrinsic (i.e., physical and psychological) and extrinsic (i.e., social) rewards of risk behavior, and response costs were integrated into the revised PMT. Most important to this discussion of unintended effects of fear appeals, the revised PMT delineates the processes leading to maladaptive responses (i.e., the

responses message designers did not intend) including continuation or initiation of risk behavior.

Overall, the revised PMT suggests three processes that may bring about unintended effects. First, Rogers suggested that the intrinsic and extrinsic rewards of risk behavior increase the likelihood of maladaptive responses to threat, while noxiousness and probability of threat decrease such likelihood. Therefore, when the rewards of risk behavior outweigh its noxiousness and probability, unintended effects are likely to occur.

Second, the revised PMT suggests that maladaptive responses may occur when the costs of complying to message recommendations are perceived to be greater than self efficacy and response efficacy of engaging in recommended behavior.

Finally, Rogers (1983) predicted that perceptions of low self efficacy or response efficacy in the face of strong noxiousness and/or probability of threat will result in null or boomerang effects of fear appeals, in which individuals reduce intention to engage in protective behavior.

This prediction of the interactions between efficacy and threat perception variables is consistent with the results of Rogers' earlier studies (Kleinot & Rogers, 1982; Rogers & Mewborn, 1976). Rippetoe and Rogers (1987) examined maladaptive responses to messages on the threat of breast cancer, using the revised PMT. The results indicated that high threat perceptions prompted both adaptive and maladaptive coping responses and that what determines the type of coping responses is the level of self and response efficacy, evidencing interaction between threat and efficacy.

The revised PMT's utility in explaining unintended effects of fear appeals is limited, however. The model's predictions on the combinatory rule of its variables are inconsistent. At one point, Rogers (1983) stated that severity, vulnerability, self efficacy, and response efficacy work in an additive manner to elicit protection motivation. Elsewhere in the same work, Rogers predicted a multiplicative combination of the same four variables (Witte, 1998).

Health belief model. Another expectancy-value model that posits threat as a motivational factor is the health belief model (HBM) (Rosenstock, 1974; Janz & Becker, 1984). Bearing much resemblance to fear appeal theories, the HBM predicts that perceived susceptibility and severity motivate individuals to engage in preventive actions, and perceived benefits and barriers determine the type of preventive action to be engaged. The HBM has been used and supported in extensive domains of health communication campaigns.

However, some pointed out that many of HBM studies were retrospective, which limits the inference of causality (Kegeles, 1981). The HBM has also been criticized for its lack of specificity in the description of combinatory rules of variables. Therefore, the HBM may provide a set of variables that produce intended effects, but no theoretical framework explaining neither intended nor unintended effects (Wallston & Wallston, 1984).

Possibly because of these factors, reports of unintended effects are rarely found in reviews of the HBM studies (e.g., Montgomery et al., 1989; Rosenstock, 1974). One exception is Joseph et al.'s (1987) longitudinal study of a cohort of gay men. Increased

susceptibility was associated with deleterious effects such as obsessive/compulsive behavior, distress in social role playing, and distractive concerns and worries about AIDS.

Psychological Reactance

Yet another explanation advanced for unintended effects of fear appeals was psychological reactance (Brehm, 1966). According to reactance theory, individuals experience reactance when they perceive their freedom to engage in different kinds of behavior is threatened. As a result, individuals will be motivated to restore the behavioral freedom by changing their attitude toward communicator negatively and/or engaging in behavior opposite to the ones recommended.

Reactance theory has been supported in a range of areas including alcohol prevention messages (Bensley & Wu, 1991) and patient compliance (Graybar, Antonuccio, Boutilier, & Varble, 1989). For example, Allen, Sprenkel, and Vitale (1994) predicted that after the change of U.S. legal drinking to 21 years of age, underage college students would drink more than their legal age counterparts because of perceived reduction in behavioral choices. The results lent support to reactance theory.

That reactance triggers reactions opposite to message recommendations appears to be relatively clear. For example, derogation of fear-arousing messages was negatively associated with attitude (Witte, 1992a). Similarly, Heilman and Garner (1975) report that toward messages and communicators restricting their behavioral choices, subjects expressed negative attitudes. However, research to date does not provide a clear picture whether the feeling of fear creates reactance. Meta-analysis of fear appeal studies (Boster

& Mongeau, 1984; Mongeau, 1995) found that the relationship between fear and compliance to message recommendations is positive and linear.

It may be necessary to distinguish threats to freedom from threats to health. Brehm's (1966) prediction would pertain to the former. It has yet to be determined whether the latter will induce the experience of reactance as well. For example, Bensley and Wu (1991) manipulated high and low threat to determine alcohol prevention messages' effects on college students. Although the results clearly supported the predictions of reactance, what was actually manipulated in their study was the level of dogmatism in message recommendations, not the level of susceptibility or severity of alcohol use. Therefore, the construct of fear in and of itself may not necessarily elicit reactance.

A fear-arousing health communication message has a potential to produce reactance, however, because it by default includes behavioral recommendations (Rogers, 1975; 1983; Witte, 1992b). Hence, it may be perceived as more inhibitive than other types of messages.

Parallel Process Models

Parallel process model. Leventhal (1970; 1971; Leventhal, Safer, & Panagis, 1983) theorized that fear appeals can elicit two kinds of processes: danger control and fear control. Danger control process refers to the one in which individuals think about ways to avert the threat presented in fear appeal messages. Therefore, this is a cognitive process leading to intended outcomes of fear appeals.

On the other hand, fear control process produces the effects health communication campaigners would not intend in designing and delivering fear appeal messages. In this process, the experience of fear motivates individuals to reduce the emotional tension by denying the threat presented in messages or avoiding any cues that may create fear. Therefore, fear control process accounts for unintended effects of fear appeals. Overall, what motivates individuals to comply to message recommendations is not emotional arousal, but cognitive appraisal, according to this model.

While some researchers lauded the model for its recognition of differential processing of fear appeal messages, others pointed out its lack of specificity and unfalsifiable nature (Boster & Mongeau, 1984; Dillard, 1994; Rogers, 1975; 1983; Witte, 1994). The extended parallel process model (Witte, 1992b; 1994; 1998) explicates fear control as well as danger control processes.

The extended parallel process model. The EPPM (Witte, 1992b; 1994; 1998) is built upon Leventhal's (1970; 1971; Leventhal, Safer, & Panagis, 1983) parallel process model. In explaining intended effects of fear appeals, the EPPM adopts Rogers' (1975; 1983) protection motivation theory. In explaining unintended effects of fear appeals, it partly borrows from Janis' (1967) drive model.

The key components of the EPPM are described below (Witte, Cameron, McKeon, & Berkowitz, 1996, p. 320). Fear refers to a negative emotion aroused by a threat. Threat refers to a risk, harm, or danger. Perceived threat refers to the beliefs about the risk. It comprises perceived susceptibility and severity. Perceived susceptibility refers to personal beliefs about the probability of experiencing the threat.

Perceived severity refers to personal beliefs about the magnitude of the threat. Perceived severity and susceptibility work in an additive manner.

Efficacy comprises response and self efficacy. Response efficacy refers to personal beliefs about the effectiveness of message recommendations in controlling the threat. Self efficacy refers to personal beliefs about one's ability to carry out the message recommendations to control the threat. Self and response efficacy work in an additive manner.

According to the EPPM, the processing of a fear appeal message can result in three types of responses (Witte et al., 1996). When a threat does not elicit sufficiently high level of susceptibility or severity, individuals are not motivated to process the message, and the fear appeal does not result in any responses.

Next, when a threat is sufficiently high to reach a certain threshold level, individuals are motivated to engage in either danger control process or fear control process. First, individuals evaluate the threat. The greater the threat perceived, the greater the motivation to appraise the level of efficacy. It is the level of perceived efficacy that determines whether an individual will go through danger control or fear control process.

Danger control process. When individuals' perceive efficacy is stronger than perceived threat, they engage in danger control process. This is primarily a cognitive process which elicits protection motivation. In this process, individuals believe that the they are susceptible to a threat which is severe, and that they are able to effectively avert the threat. Therefore, protection motivation prompts them to ways of averting the threat

and to adopt message recommendations. EPPM research has measured danger control process in terms of changes in attitude, behavioral intentions, and behavior. This danger control process would be intended effects of health communication campaigns using fear appeals, because health communication campaigns intend to induce attitude and behavior changes (Rogers & Storey, 1987).

Fear control process. When the perceptions of threat is stronger than the perceptions of efficacy, individuals engage in fear control process. This is primarily an emotional process, prompted by defensive motivation. Fear control process occurs when individuals believe that they are susceptible to a threat which is severe, but do not believe themselves to be able to perform message recommendations and/or that the message recommendations to be effective in averting the threat. High level of fear caused by this process produces defensive motivation, resulting in coping responses that reduce fear and prevent danger control responses from occurring. EPPM research has measured fear control process in terms of defensive avoidance, message derogation, and perceived manipulation. This type of responses would pertain to unintended effects of health communication campaigns using fear appeals, because individuals avoid or react to persuasive messages, and do not attempt to deter threats to their health condition.

The EPPM departs from the PMT and the original Parallel Process Model by reinstating fear to fear appeals. Rogers (1975) posited that fear does not influence intended attitude change neither directly not indirectly. Leventhal (1970) theorized that fear control leading to unintended effects and danger control leading to intended effects are mainly independent.

However, metaanalyses of fear appeals (Boster & Mongeau, 1984; Mongeau, 1995) have found positive and linear relationship between perceived fear and intended effects. The EPPM offers a reconciliation by suggesting an indirect relationship between fear and intended effects. Specifically, when perceived efficacy is high, the association between fear and intended changes in attitude, intentions, and behavior is mediated by perceived threat. As a result, fear has returned in the process of motivating individuals to comply to message recommendations, although indirectly. Fear produces intended effects only when efficacy is high; if not, fear primarily produces unintended effects (Witte, 1992b).

The EPPM has been tested in various health communication areas such as AIDS (Witte 1992a), genital warts (Witte, Berkowitz, Cameron, & McKeon, 1998), tractor safety practices (Witte, Peterson, Vallabhan, Stephenson, Plugge, Givens, Todd, Becktold, Hyde, & Jarrett, 1993), and electromagnetic fields (McMahan, Witte, & Meyer, 1998a). In summary, the EPPM explains and predicts the conditions under which intended and unintended effects of fear appeals are likely to occur. This study uses the EPPM to examine unintended effects of fear appeals.

Fear Appeals and Audience Characteristics

The EPPM posits that individual differences may influence the effects of fear appeals. Indeed, audience characteristics have long been noted to impact the effects and effectiveness of fear appeals. For example, fear appeals were more effective for older audience than younger audience (Boster & Mongeau, 1984; Carmel, 1995). Individuals with high trait anxiety showed greater magnitude of defensive avoidance than those with

low trait anxiety (Witte & Morrison, 1995a). A study found that high fear was more effective for high sensation seekers, while low fear was more effective for low sensation seekers (Donohew, Sypher, & Buloski, 1991). On the other hand, Witte and Morrison (1995b) found that high sensation seekers were not persuaded by fear appeal messages regardless of fear arousal level. Horowitz (1969; 1972) found that audience who volunteered to be exposed to fear appeals were more likely to be persuaded than non-volunteers.

One of the audience characteristics that has yet to be applied to fear appeal research to determine its influence on unintended as well as intended effects is stages of behavior change. The next section describes the transtheoretical model, a theory of stages of change. Using the EPPM and the TM, this study attempts to examine the effects of fear appeals on individuals in different stages of change.

The Transtheoretical Model

A model that elucidates the dynamic process of health behavior change is the TM (Prochaska & DiClemente, 1988; Prochaska, DiClemente, & Norcross, 1992). The TM is a more integrative approach to behavior change as its key components, stages of change, may subsume many different factors explained and predicted by other theories.

Based on the assumption that behavior change is an ongoing process involving a series of stages, the TM has been tested and supported in diverse areas including smoking cessation (Prochaska & Diclemente, 1983; De Vries & Backbier, 1994), alcohol abstinence (Diclemente & Hughes, 1990), sun screen use (Rossi, 1989), dietary change (Glanz, Patterson, Kristal, DiClemente, Heimendinger, Linnan, & McLerran, 1994), and

contraceptive use (Grimley, Riley, Bellis, & Prochaska, 1993). A similar pattern of stages of change emerged with regard to these different kinds of behaviors (Prochaska et al., 1994; Rimer, 1996).

Stages of Change

Within the model are three major components, stages and process of change and decisional balance which are explained below (Prochaska et al., 1992).

Precontemplation. The stage at which individuals have no intention to stop a risky behavior or start a healthy behavior in the foreseeable future. The TM measures the intentions to change in six-month time frame. Thus, precontemplators are those who do not intend to engage in changes within six months. Individuals at this stage do not intend to engage in change for many possible reasons. For example, they may lack knowledge of the risk involving their current behavior. Or, they may be unwilling to acknowledge that their behavior puts them at risk.

Contemplation. The stage at which individuals consider stopping their risky behavior or starting a healthy behavior in the foreseeable future. Individuals at this stage have not engaged in behavioral change, but they intend to initiate changes within six months. The TM also predicts that individuals may stay at this stage for a long period of time due to the difficulty in evaluating the advantages and disadvantages of behavior change.

Preparation. The stage at which individuals intend to change their risky behavior or start a healthy behavior. Individuals at this stage have not engaged in behavior change, but they intend to do so within a month.

Action. The stage at which individuals engage in behavior change. Individuals in the action stage have tried to stop their risky behavior or start healthy behavior, but for no more than a month.

Maintenance. The stage at which individuals routinize the healthy behavior and try to prevent regression into the risky behavior. Individuals at this stage have engaged in behavioral change for more than six months.

Regression is possible at any point of these stages of change, and individuals may or may not resume the progress.

Processes of Change

The stages of change explain when changes in behavioral intentions occur. The processes of change provide what may help progress though the stages of change. Processes of change comprise an array of coping strategies that individuals use to change their behavior. Studies (DiClemente & Prochaska, 1982; Prochaska & Diclemente, 1984) have found that the relative contribution of each process is different from stage to stage.

Precontemplation to contemplation. For example, the move from the precontemplation to the contemplation stage was facilitated by consciousness raising, dramatic relief, and environmental reevaluation processes.

Contemplation to preparation. The transition from contemplation to preparation was expedited by self-reevaluation.

Preparation to action. As persons move from preparation to action, self-liberation process was effective.

Action to maintenance. Behavioral processes, such as reinforcement management, helping relationships, counterconditioning, and stimulus control were effective in moving individuals from the action to the maintenance stage (Prochaska et al., 1992).

Decisional Balance

Individuals at different stages of a behavior change are different from each other in their decisional balance (Janis & Mann, 1977) of perceived advantages and disadvantages of the new behavior. Decisional balance is a mental balance sheet for accounting potential gains and costs resulting from any decision. It is assumed that individuals will not decide to change or continue a behavior unless they perceive advantages to outweigh the disadvantages.

Prochaska and colleagues' (1994) study of stages of change and decisional balance for twelve risky behaviors found that across behaviors the advantages of change were higher in the contemplation stage than in precontemplation and that the disadvantages of change were lower in the action stage than in contemplation. This finding may suggest that progress from the precontemplation to the contemplation stage involves an increase in the awareness of the advantages of change, and that the transition from the contemplation to the action stage involves a decrease in the prominence of the disadvantages of change.

Relationship with Other Models

The TM serves as an important basis for dynamic audience segmentation and message design. Baranowski (1989-1990) used the TM to recommend both individual-

and environmental-level strategies to move target audiences through each of the stages of change. Andreasen (1995) explained how to apply social marketing strategies to the TM categorization to help people move through the stages of change. Maibach and Cotton (1995) described how the social cognitive theory (Bandura, 1986) can facilitate the progress through stages.

Overall, researchers tend to suggest that in moving persons from precontemplation to contemplation stage, awareness and knowledge of risk is important. For contemplators to move to preparation stage, messages addressing advantages of healthy behavior and disadvantages of risky behavior are recommended. To move persons from preparation to action and maintenance, providing skills and social support is emphasized.

Champion (1994) tested the relationship of the variables of the HBM and the TM with regard to mammography adoption. Women in the contemplation and action/maintenance stages had significantly higher benefit perceptions than those in the precontemplation stage. Barrier perceptions were significantly higher for women in the precontemplation stage than those in the contemplation and action stages. Women in action/maintenance stages had significantly higher susceptibility and severity perceptions than those in the precontemplation or contemplation stages.

As such, individuals' behavioral change can be facilitated if stage-appropriate messages are delivered. Conversely, use of stage-inappropriate messages may hinder progress or trigger a regression to an earlier stage (Maibach & Cotton, 1995).

Therefore, the TM and the EPPM can provide a useful framework to examine the conditions under which unintended effects of fear appeals may occur. Research is needed to determine the influence of dynamic audience characteristics of stages of change on the effects of fear appeals. The following section discusses relationships among TM and EPPM variables.

Linking the Transtheoretical Model and the Extended Parallel Process Model

High Threat

According to the EPPM, whether a fear appeal message results in intended or unintended effects depends on the level of perceived efficacy, comprising self and response efficacy. Specifically, the EPPM predicts that high threat messages will bring about intended effects on attitude, intentions, and behavior when perceived efficacy is high. On the other hand, when perceived efficacy is low, high threat produces unintended effects such as defensive avoidance, message derogation, and perceived manipulation.

Studies of the TM have found that the level of self efficacy increases as persons move from precontemplation to maintenance stages (Gorely & Gordon, 1995; Grimley, Riley, Bellis, & Prochaska, 1993; Marcus, Eaton, Rossi, & Harlow, 1994; Prochaska, Harlow, Redding, & Snow, 1990).

Few studies have examined the changes in the level of response efficacy across stages. However, it would be reasonable to assume that response efficacy increases as well, as persons move from precontemplation to maintenance stages. Decision balance is different from response efficacy, but would be somewhat similar as the consideration of the former may implicitly include the latter. Prochaska et al. (1994) found that when

individuals moved from the precontemplation to contemplation stage, the advantages of recommended behavior came to outweigh disadvantages across 12 risky behaviors, and the advantages remain outweighing disadvantages from the contemplation through maintenance stage in 6 out of the 12 behaviors.

Studies on behavior and coping strategies suggested differential effects of threat on individuals who adopt healthy behavior and who do not. In Fruin, Pratt, and Owen's (1991) study, which examined the relationship between exercise status and coping strategies, active persons responded with adaptive coping strategies, such as rational problem-solving and intention to engage in recommended behavior, more strongly than did inactive ones following messages on exercise and cardiovascular disease. Similarly, a study on food safety (Schafer, Schafer, Bultena, & Hoiberg, 1993) found that individuals who have engaged in healthy, preventive behaviors and had quality diets were more likely to respond to a health threat with adaptive coping strategies. From the EPPM standpoint, it can be conjectured that the response of adaptive coping strategies by those who have performed recommended behavior (i.e., persons in action and maintenance stages) may stem from high self and response efficacy developed from their experience.

Therefore, because the level of efficacy increases as persons move from the precontemplation to maintenance stage, unintended effects of fear appeals are less likely to occur in later stages than earlier stages.

In this study, the term "unintended effects of fear appeals" refers to the following (refer to Table 2). The first group of such effects are the outcomes of the fear control process in the EPPM: defensive avoidance, message derogation, and perceived

manipulation. Health communication campaigns using fear appeals intend changes in attitudes, intentions, and behavior in the direction of message recommendations. Fear appeal message designers would certainly not intend audience to avoid message cues and distort or dislike the message.

Next, unintended effects of fear appeals in this study also include the maladaptive coping strategies to threat examined in Rippetoe and Rogers' (1987) study: fatalism, hopelessness, and wishful thinking. These coping strategies were first identified by McCrae as those occurring in reactions to threat. Strategies such as defensive avoidance and fatalism can be termed as adaptive in the sense that they may reduce distress invoked by threat (Rippetoe & Rogers, 1987). However, Rippetoe and Rogers used the term "maladaptive" because these strategies do not "directly manage the threat to physical well-being by dealing with the reality of the situation" (p. 598). In the EPPM context, fatalism, hopelessness, and wishful thinking would be outcomes of the fear control process. Individuals attempt to control fear by becoming fatalistic or thinking wishfully rather than to control danger by engaging in rational thinking or preventive behavior. In addition, psychological reactance (Brehm, 1966) will also be examined as a form of unintended effects of fear appeals as it may trigger boomerang effects in attitude, intentions, and behavior.

High threat may produce different type of unintended effects in association with different types of low efficacy. Earlier research on fear appeals (Hovland et al., 1953; Rogers, 1975) focused on response efficacy and its relationship with threat. Bandura's

(1977) self-efficacy was integrated into later theories of the fear appeal including the revised PMT and HBM and the EPPM.

When perceived response efficacy is low, individuals may respond to high threat messages with fatalism. Because persons perceive that message recommendations are not effective in controlling a serious danger to which they are susceptible, they may try to control fear by accepting the situation and by not following message recommendations (Rippetoe & Rogers, 1987).

Rippetoe and Rogers (1987) also suggested when perceived self efficacy is low, persons may respond to high threat messages with hopelessness. It is because while individuals do not accept the situation as unchangeable, they do not perceive that they are able to carry out the message recommendations either. As a result, they may feel helpless and possibly intensify their risky behavior.

Low Threat

According to the EPPM, low threat has no effects because it leads to minimal message processing and changes in attitude, intentions, and behavior (Witte, 1994). However, some research suggests that low threat, under certain conditions, may produce unintended effects as well by decreasing perceived risk and increasing perceived benefits of risk behavior. This line of reasoning is drawn from studies on the effects of anti-drug abuse public service announcements (Feingold & Knapp, 1977) and government warnings on alcoholic products (Blood & Snyder, 1993; Snyder & Blood, 1992).

Although these studies do not discuss the results in explicit terms of low threat, an examination of the fear appeal messages used in the experiments suggests that it may be

the case. When compared to many of the experimental stimuli of high threat which presented vivid and graphic pictures and emphasized the severity of and subjects' susceptibility to disease (e.g., Janis & Feshbach, 1953; Janis & Terwilliger, 1962; Kleinot & Rogers, 1982; Rippetoe & Rogers, 1992; Rogers & Mewborn, 1976; Witte, 1992a; Witte & Morrison, 1995a), the warnings can be categorized as low threat messages.

The alcohol warning label used in Snyder and Blood's (1992; Blood & Snyder, 1993) studies reads: "According to the Surgeon General, (1) women should not drink alcoholic beverages during pregnancy because of the risk of birth defects; (2) consumption of alcoholic beverages impairs your ability to drive a car or operate machinery, and may cause health problems." Apparently, the message does not likely to elicit much perception of susceptibility among persons who are not pregnant, drivers, or machine operators. Next, the severity of the consequences of drinking is described just as "health problems." Furthermore, the gruesome photos of patients with disease which have often been used in high threat manipulation are absent in warnings. Indeed, Blood and Snyder (1993) reported that the most important factor accounting for the boomerang effects of their study was the perception that the likelihood of an accident due to drinking was low.

Low threat, however, may just result in null effects, instead of unintended effects, unless some other factors play a role of moderator or mediator. This study attempts to empirically test if low threat results in unintended effects, and if so under what conditions.

When the probability that threat will be averted by message recommendations was perceived as low, alcohol warning increased the benefits of risky behavior. If perceived response efficacy is low, current behavior involving risk may look more attractive. Under this circumstance, individuals may decide to continue to take the risk, instead of engaging in the recommended behavior. This unintended effect is most likely to occur in precontemplation stage. Disadvantages of changing behavior have been found to outweigh advantages, which may be analogous to response efficacy as discussed previously, in this stage.

Relationship between Unintended and Intended Effects

In general, the unintended effects of fear appeals are likely to be negatively associated with intended effects (Leventhal, 1971; Witte, 1992a). For example, defensive avoidance was found to be negatively associated with subsequent recall of fear appeal message (Janis & Feshbach, 1953), behavioral intention (Rippetoe & Rogers, 1987), and behavior (Witte, 1992a).

However, not all unintended effects are likely to interfere with intended effects. For example, research on stress coping indicated that anxiety is positively associated with social support seeking (Schacter, 1959; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985). Janis and Feshbach's (1953) study found that while subjects exposed to high fear appeals expressed more of perceived manipulation and message derogation, they were more likely than others to favorably evaluate the quality of the message.

Hence, it was suggested that such responses to high threat may not trigger the rejection of message (Hovland, Janis, Kelly, 1953; Janis & Feshbach, 1953). Somewhat

similarly, Leventhal, Singer, and Jones' (1965) study found that while subjects exposed to high threat messages were more angry than those exposed to low threat messages, they indicated greater behavioral intention. Moreover, Witte (1992a) reported that perceived manipulation is positively associated with behavior change.[1]

Witte's (1992a) findings also included that message derogation is not related to attitude change, behavioral intention, and behavior. Likewise, Blood and Snyder (1993) found that reactance[2] showed positive association with fear, but did not interfere with behavioral intentions to result in boomerang effects. Rippetoe and Rogers (1987) suggested that fatalism may not be related to intended effects and other unintended effects because by accepting their fate, persons are not likely to engage in other modes of coping, be it danger control or fear control. On the other hand, they suggested that hopelessness may lead to counterproductive behavior as a reaction to their belief that they cannot perform the recommended behavior successfully. However, if fatalism is an outcome of low response efficacy in the face of high threat as discussed previously, it may also trigger counterproductive behavior. Intention to increase risk behavior was found in studies in which only response efficacy was manipulated (e.g., Kleinot & Rogers, 1981; Rogers & Mewborn, 1976). Furthermore, fatalism was positively

[1] Hovland, Janis, and Kelly (1953) pointed out that this may be a result of lack of cues raising subjects' suspicion of the source's intention. For example, Janis and Feshbach's (1953) experimental stimuli were presented as an official part of the high school's hygiene program. In Witte's (1992a) experiment, fear appeal messages were presented as as part of AIDS education materials. Therefore, reactance (i.e., perceived manipulation and message derogation) to fear appeals used in health communication campaigns which have manifest intent to do social good is not likely to result in message rejection.

[2] While reactance is defined as message derogation and perceived manipulation in the EPPM (Witte, 1992a), Blood and Snyder's (1993) measures of reactance are close to Brehm's (1966), and include: "It's my life. I should be able to drink and drive if I want to;" Nobody should be telling me when or where I can drink;" "I resent being told I can't drink and drive."

associated with behaviors that increase the risk of contracting AIDS (Kalichman, Kelly, Morgan, & Rompa, 1997; McKirnan, Ostrow, & Hope, 1996). Therefore, fatalism, along with hopelessness, may result in counterproductive behavior. On the basis of previous discussion, the following hypotheses and research questions are proposed.

Hypotheses and Research Questions

H1: In general, the magnitude of unintended effects of fear appeals is likely to be greater in earlier stages than later stages.

H1a: The magnitude of unintended effects is greater in the precontemplation stage than in the contemplation stage.

H1b: The magnitude of unintended effects is greater in the contemplation stage than in the preparation stage.

H1c: The magnitude of unintended effects is greater in the preparation stage than in the action stage.

H1d: The magnitude of unintended effects is greater in the action stage than in the maintenance stage.

H2: When perceived efficacy is low, perceived high threat is likely to bring about greater degree of unintended effects than when perceived efficacy is high.

H3a: When perceived response efficacy is low, perceived high threat is likely to bring about greater degree of fatalism than when perceived response efficacy is high.

H3b: When perceived self efficacy is low, perceived high threat is likely to bring about greater degree of hopelessness than when perceived self efficacy is high.

H4: When perceived threat is low, attitude toward risk behavior is likely to be more

favorable when response efficacy is low than when response efficacy is high.

RQ1: How do threat, efficacy, and stages of change interact in bringing about unintended effects?

RQ2: How are unintended effects associated with intended effects?

CHAPTER 3

METHOD

Design

Overview

A lab experiment involving messages on the topic of "skin cancer" was designed to test the proposed hypotheses and to answer the research questions.

Threat (susceptibility, severity) was manipulated in two (high, low threat message) levels. Efficacy was not manipulated but measured to examine its possible main as well as interaction effect with threat and stages of change. Subjects' stages of change were measured immediately before the experiment.

The dependent variables included defensive avoidance, message derogation, perceived manipulation, fatalism, hopelessness, reactance, wishful thinking, attitude toward risk and recommended behavior, intentions to engage in preventive behavior, and risk and preventive behavior. Behavior was measured four weeks after the experiment in a follow-up questionnaire.

Subjects

Subjects of this study (n=274) were Michigan Stage University undergraduate students recruited from introductory advertising, communication, and telecommunication courses for extra credit and a drawing for gift certificates. To include subjects in all stages of change, no prescreening of subjects in terms of skin cancer knowledge was done.

Overall, 60.6 percent of the respondents were female, and 39.4 percent of them were male. Respondents' age ranged from 18 to 37 (SD =2.1), and the typical age was 20 (mean, median, mode = 20). Caucasians comprised 83.6 percent of the respondents. Asians, African-Americans, and Hispanics represented 6.9, 6.2, and 1.5 percent of the respondents, respectively.

In the four-week follow-up, 239 subjects participated, producing an attrition rate of 12.7%.

Procedure

Subjects participated in the experiment in groups of varying size ranging upto thirty. After a one-page questionnaire assessing their stages of change was administered, subjects were randomly assigned to one of the two experimental conditions (high, low threat).

As has been the case in many previous fear appeal studies (e.g., Janis & Feshbach, 1953; Witte, 1992b), the experiment was presented as a part of public health campaign project. Subjects were told that the messages were in the early stages of development to provide college students with facts about skin cancer and that their responses were important for further improvement of the messages. To ensure full attention, subjects were asked to read the messages carefully and to underline important words, phrases, or sentences in each of the paragraphs.

Following the instructions, high or low threat messages including five photos were distributed to the subjects. Immediately after reviewing the messages, subjects completed posttest questionnaires. Four weeks later, subjects were visited in their

classrooms for the completion of a follow-up questionnaire. After this, subjects were debriefed about the purpose and design of the study to clear up any possible misunderstanding and were given skin cancer prevention brochures from the American Cancer Society.

Stimulus Materials

Messages were developed with Witte's (1993) recommendations and information and verbatim quotes obtained from existing skin cancer prevention messages from such organizations as the National Cancer Institute, the American Cancer Society, and the American Academy of Dermatology. Each message manipulation consisted of factual messages, a case of a fictitious skin cancer patient, and five photos (see Appendix A2 and A3).

The high threat message described skin cancer in detail, presenting vivid descriptions of its symptoms and consequences. College-aged persons' susceptibility to skin cancer was emphasized. For example, the case for the high threat message read: "Jennifer, a 21-year old student at Michigan State University, discovered a freckle near her eye... A year later, Jennifer became one of 9,500 patients to die from skin cancer." The high threat message also included graphic color photos of skin cancer patients' body parts.

The low threat message described skin cancer as a less severe disease with fewer significant consequences. College-age persons' susceptibility to skin cancer was minimized by noting the fact that skin cancer most frequently affects persons of age over 50. For example, the case for the low threat message read: "A 52-year old farmer in New

Zealand went to see a doctor because he has developed an unusual mole on his face... Because skin cancer rarely spreads, a biopsy often is the only test needed to determine the stage of skin cancer." The low threat message included color photos conveying neutral images, such as clinical lab results (e.g., Witte, 1992a). Both high and low threat messages were based on facts, and they were equated for length, order, complexity, and quality. Recommended behavior included sunscreen use, wearing protective hat and clothing, minimizing sun exposure at midday, and performing periodic skin self-examination. The messages were subjected to pilot tests.

Measures

Seven-point Likert scales, ranging from "strongly agree" to "strongly disagree," were used, unless otherwise noted (see Appendix B for a full description of the measures). To generate an index for each of the constructs, items in the same construct were averaged. Cronbach's alphas were used to evaluate the reliability of measures, which are presented in Table 4.

Stages of Change

Following previous TM studies (DiClemente et al., 1991; Grimley et al., 1993; Prochaska, 1994), a mutually exclusive stage classification algorithm was used so that all subjects could be classified into only one stage. Each subject was asked to select one item that best represents their current sunscreen-use behavior. Table 3 presents a summary.

Table 3 Distribution of Stages of Change

Stage	Classification	%
Precontemplation	Subjects did not use sunscreen consistently when going out in the sun, and do not intend to start using it consistently within the next 6 months.	52.2
Contemplation	Subjects did not use sunscreen consistently when going out in the sun, but intend to start using it consistently within the next 6 months.	19.7
Preparation	Subjects did not use sunscreen consistently when going out in the sun, but intend to start using it consistently within the next 30 days.	4
Action	Subjects used sunscreen consistently when going out in the sun, but for less than 6 months.	9.9
Maintenance	Subjects used sunscreen consistently when going out in the sun for more than 6 months.	21.2

Intention to use sunscreen in the next 6 months was used to differentiate contemplators from precontemplators. Intention to use sunscreen in the next 30 days was used to distinguish prepared subjects from contemplators. Subjects who have attempted sunscreen use from one day to six months were categorized as actors. Those who have used sunscreen for more than six months were classified as maintainers. Overall, 52.2 percent of subjects were in precontemplation stage and 19.7 percent in contemplation stage. Four percent of subjects were in preparation stage, 9.9 percent in action stage, and 21.2 percent in maintenance stage.

To minimize variance differences resulting from unequal cell sizes, stages of change were reduced from five to three. Contemplation stage (i.e., the one in which individuals intend to engage in preventive behavior in six months), was merged with the preparation stage (i.e., the one in which individuals intend to engage in preventive behavior in a month), because both stages have to do with behavioral planning, although in different time spans. Action stage, (i.e., the one in which individuals have engaged in preventive behavior for less than six months), was merged with the maintenance stage (i.e., the one in which individuals have engaged in preventive behavior for more than six months), because both stages have to do with actual practices of behavior, although in different time periods.

Fear

Fear arousal (α = .95; mean = 3.02; SD = 1.72) was appraised by asking subjects to rate six mood adjectives on a scale ranging from "not at all" to "very much." The six moods were: "frightened," "tense," "nervous," "anxious," "uncomfortable," and "nauseous," as has done in many fear appeal studies (e.g., Leventhal, Singer, & Jones, 1965; Maddux & Rogers, 1983; Rippetoe & Rogers, 1987; Witte, 1992a).

Threat

Threat (α = .89; mean = 4.57, SD = 1.39) was operationalized as susceptibility to threat and severity of threat. Witte and colleagues' (1996) scale was used to measure this variable and served as a manipulation check. The susceptibility scale (α = .85; mean = 4.30; SD = 1.46) included three items: "I am at risk for skin cancer," "It is likely that I will develop skin cancer," and "It is possible that I will develop skin cancer."

The severity scale (α = .92; mean = 4.83; SD = 1.66) included three items: "I believe that skin cancer is a severe health problem," "I believe that skin cancer is serious threat," and "I believe that skin cancer is a significant disease." Because susceptibility and severity are dimensions of the threat construct (Witte et al., 1996), the items were averaged to create an overall index.

Efficacy

Measurement of efficacy (α = .90; mean = 5.18; SD = .89), operationalized as response efficacy and self efficacy, was based on Witte et al.'s scale (1996). Self-efficacy (α = .90; mean = 4.56; SD = 1.12) was assessed with fourteen items including, "I can easily perform periodic skin self-examination to prevent skin cancer" and "Wearing clothing that covers my body to prevent skin cancer is no problem for me."

Response efficacy (α = .92; mean = 5.81; SD = 1.06) was measured with seven items including, "Minimizing my exposures to the sun at midday is effective in preventing skin cancer." Because self efficacy and response efficacy are dimensions of the efficacy construct (Witte et al., 1996), the items were averaged to create an overall index.

Dependent Measures

The dependent variables included defensive avoidance, message derogation, perceived manipulation, fatalism, hopelessness, reactance, wishful thinking, attitude toward risk and recommended behavior, intentions to engage in preventive behavior, and preventive behavior.

In measuring defensive avoidance, message derogation, and perceived manipulation, Witte's (1992a) scales were used. Measures of fatalism, hopelessness, and wishful thinking were based on Rippetoe and Rogers' (1987) scales. Reactance measures were based in Blood & Snyder's (1993) items. Witte's (1992a) scale was used to measure attitudes toward risk and recommended behavior. Reliability of all measures were adequate except for reactance and wishful thinking variables.

Defensive avoidance. Subjects indicated their perceptions with regard to two statements, "When I sunbathe, I tend to avoid thoughts of skin cancer," "When I get a sunburn, I tend to avoid thinking about skin cancer," and "When I suntan, I try to not think about skin cancer" (α = .87; mean = 4.26; SD = 1.69).

Message derogation. To measure message derogation, subjects were asked if they perceived that the message was "exaggerated," "overblown," and "overstated" (α = .86; mean = 3.29; SD = 1.32).

Perceived manipulation. Perceived manipulation was assessed by asking subjects if they thought that the message was "manipulative," "misleading," "distorted," and "exploitative" (α = .86; mean = 2.92; SD = 1.13).

Fatalism. To measure fatalism, subjects were asked to indicate the degree to which they agree or disagree with the following two statements: "If you are destined to die from skin cancer, you will; there is little you can do about it" and "Only time will tell if I develop skin cancer; nothing can be done anyway but wait" (α = .69; mean = 2.28; SD = 1.33).

Hopelessness. Items for hopelessness scale included the following three items: "In this day and age, it sometimes seems a hopeless task to say healthy," "Given what I know about skin cancer, I sometimes feel it's almost useless to try to stay health," and "When I think about the prospect of cancer, I sometimes feel like saying, "What's the use in staying health?"" (α = .81; mean = 2.55; SD = 1.33).

Reactance. This construct of psychological reactance was assessed with three items including, "Nobody should be telling me when or how I can get sun," "It's my life. I should be able to get sun if I want to," and "I resent being told that I can't get sun." Reliability of this scale was low (α = .50; mean = 3.56; SD = 1.09).

Wishful thinking. Items for wishful thinking measure included, "When faced with the prospect of developing skin cancer, it helps me to dream of a world where there are no diseases like cancer," "I believe a miracle cure for cancer in the near future is the answer to my fears about skin cancer," and "Given what I know about skin cancer, I wish I belonged to another time and another place." Reliability of this scale was very low (α = .37; mean = 2.79; SD = 1.16), suggesting that the scale may comprise more than one dimensions.

Attitude. Attitude toward risk (e.g., "In general, sunbathing is") and recommended behavior (e.g., "Using sunscreen when out in the sun to prevent skin cancer is") was measured with a semantic-differential scale including two sets of word pairs: "positive -- negative" and "desirable -- undesirable." Cronbach's alphas for attitude toward risk and recommended behavior were .78 (mean = 3.63; SD = 1.53) and .89 (mean = 4.52; SD = 1.26), respectively.

Intentions. Intentions to engage in recommended behavior (α = .96; mean = 3.66; SD = 1.37) were measured with items including, "I intend to use sunscreen consistently when exposed to sun within the next 6 months" and "I intend to perform periodic skin self-examination to prevent skin cancer."

Behavior. Items measuring preventive behavior included, "Did you do anything to prevent skin cancer since you first participated in this study," "I have tried to minimize my exposure to the sun at midday since I first participated in this study, " I currently use sunscreen when exposed to the sun to prevent skin cancer" (α = .90; mean = 2.85; SD = 1.35).

Demographic variables. Age, gender, race, skin type, risk behavior (e.g., frequency of outdoor activities, number of times sunburned and peeled during the last two years, number of times visiting tanning parlors) and preventive behavior (e.g., use of sunscreen and protective clothing, minimization of sun exposure at midday), and social influence (e.g., friends' and family members' use of sunscreen, knowledge of other individuals who have cancer) were asked. In analysis, these variables were used as control variables.

Table 4 Reliability of the Measures

Index	Cronbach's α	Mean	Standard Deviation
Fear	.95	3.02	1.72
Threat	.89	4.57	1.39
Susceptibility	.85	4.30	1.46
Severity	.92	4.83	1.66
Efficacy	.90	5.18	.89
Response efficacy	.92	5.81	1.06
Self efficacy	.90	4.56	1.12
Defensive avoidance	.87	4.26	1.69
Message derogation	.86	3.29	1.32
Perceived manipulation	.86	2.92	1.13
Fatalism	.69	2.28	1.33
Hopelessness	.81	2.55	1.33
Reactance	.50	3.56	1.09
Wishful thinking	.37	2.79	1.16
Attitude			
toward risk behavior	.78	3.63	1.53
toward recommended behavior	.89	4.52	1.26
Intentions	.96	3.66	1.37
Behavior	.90	2.85	1.35

Note. Seven-point Likert scales, ranged from "strongly agree to strongly disagree," were used.

Analysis

To test H1, planned comparison of means was done initially. Specifically, contrast coefficients (-1 1 0, 0 -1 1) were used to compare adjusted means of dependent variables in each of the three stages after controlling for confounds. Covariates were not controlled in the analysis of H1 because stages of change may subsume such covariates.

In addition, to detect any other possible significant differences among means, a Tukey-B test was done. The above described contrast tests limit number of comparisons to k-1. A one-way analysis of variance was done first. When the overall F ratio was significant, a Tukey-B test was done to determine the significance of mean differences. Tukey-B test was chosen over Scheffe' test which is too conservative (Kerlinger, 1986). Like Scheffe', the Tukey-B test makes all comparisons and is adequate for unequal n sizes (Kirk, 1982).

To test H2, H3a, H3b, H4, and RQ2, the analysis of covariance (ANCOVA) method was used to control for covariates and confounds exerting significant influences. A regression approach was employed to adjust for unequal number of subjects on some of the variables (Tabachnick & Fidell, 1996).

In testing H2, a median (4.67 on a 7-point scale) split was done for the efficacy measure to perform 2 (high, low threat) x 2 (high, low efficacy) factorial analysis. In testing H3a, a median (6.00 on a 7-point scale) split was done for the response efficacy measure to perform 2 (high, low threat) x 2 (high, low response efficacy) factorial analysis. In testing H3b, a median (4.57 on a 7-point scale) split was done for the

efficacy measure to perform 2 (high, low threat) x 2 (high, low self efficacy) factorial analysis.

To answer RQ1, a 2 (threat) x 2 (efficacy) x 3 (stage) ANCOVA, controlling covariates and confounds, was done to detect significant main effects of and interaction effects among the three variables. Partial correlations, controlling for confounds, were run to answer RQ2.

CHAPTER 4

RESULTS

Message Validation

Multiple pilot tests were done to equate the high and low threat messages in terms of accuracy, objectivity, ease of reading, understandibility, and amount of learning and to appraise any differences in these dimensions. The results of final pilot study indicated no significant differences in these confound check measures ($p > .05$).

The pilot tests also validated threat message manipulations. Subjects were randomly given either high or low threat messages. Their perceived susceptibility, severity, and fear were measured on a 7-point scale (see the next section for the description of measures). Independent sample t-test were used to determine the difference between means. Results indicated significant ($p < .05$) differences between high and low threat messages in terms of susceptibility, severity, and fear.

Manipulation Checks

Susceptibility. Subjects who were exposed to the high-threat message reported a greater level of susceptibility of skin cancer ($M = 5.00$) than those who were exposed to the low threat message ($M = 3.59$, $t = -9.16$, $df = 272$, $p < .001$).

Severity. Subjects who were exposed to the high-threat message perceived that skin cancer is more severe disease ($M = 5.86$) than those who were exposed to the low threat message ($M = 3.78$, $t = -13.41$, $df = 272$, $p < .001$).

Fear. Subjects who were exposed to the high threat message perceived a greater level of fear (M = 4.23) than those who were exposed to the low threat message (M = 1.74, t = -17.22, df = 263, $p < .001$).

Therefore, the results of susceptibility, severity, and fear manipulations presented above indicate that the high and low threat messages produced significantly different perceptions of threat.

Confound checks. Subjects who were exposed to the high and low threat messages did not show any difference in their self efficacy or response efficacy. No differences were found between high and low threat condition subjects in terms of their perceived objectivity of the messages. However, subjects in the high threat condition believed that the message was more accurate (M = 5.54) and clear (M = 5.74) and of better quality (M = 5.52) than those who were in the low threat condition (M = 4.90, t = -3.65, df = 272, $p < .001$; M = 5.11, t= -3.82, df = 271, $p < .001$; M = 4.50, t = -5.65, df = 271, $p < .001$, respectively). Subjects in the high threat condition also believed that they understood (M = 6.07) and learned (M = 5.51) from the message more than those who were in the low threat condition (M = 5.58, t = -3.34, df = 272, p = .001; M = 4.63, t= 44.62, df = 272, $p < .001$, respectively).

These differences occurred in spite of the fact that the high and low threat messages were validated through pilot tests. As mentioned earlier, in the final pilot test, such differences were not detected ($p > .05$ for all items) perhaps because of the idiosyncrasy of the sample or small sample size (n= 14); pilot test subjects may have primarily been precontemplators, who often lack knowledge of risk.

One possible reason for these differences may be that the prescreening of subjects was not done for this study, because the purpose of this study is to determine individuals in different stages of changes' reactions to fear appeals. Furthermore, skin cancer is a relatively well-known disease (Clarke, 1997; Hanley, 1996). Therefore, some subjects may have perceived that the low threat message stating that college students are at low risk and that treatment is easy and painless may not entirely accurate.

The results of thought-listing also shed some light. Subjects who were exposed to the low threat message complained about the lack of pictures showing actual skin cancer symptoms. Some subjects in the low threat condition questioned why they have to engage in preventive behavior if college students are at low risk of skin cancer. These factors may have affected low threat condition subjects' perceptions of clarity and quality and the degree to which they learned and understood the message.

To control for their influence, the confounds were controlled in analyses, as reported in the following sections. Results of zero-order correlation among variables are presented in Table 5.

Table 5 Zero-Order Correlations among Variables

	Fear	Threat	Efficacy	Defensive avoidance	Message derogation	Perceived manipulation
Fear						
Threat	.67*					
Efficacy	.17*	.25*				
Defensive avoidance	-.04	-.00	-.06			
Message derogation	-.16*	-.18*	.25*	.11		
Perceived manipulation	-.10	-.03	-.21*	.05	.60*	
Fatalism	.13*	.10	-.15*	.10	.11	.17*
Hopelessness	.21*	.19*	-.12*	.18*	.09	.30*
Reactance	-.18*	-.17*	-.11	.22*	.27*	.22*
Wishful thinking	.36*	.28*	.08	.07	-.08	.10
Attitude: risk behavior	.10	.08	.15*	-.30*	-.14*	-.09
Attitude: recommended behavior	.04	.09	.33*	-.15*	-.11	-.04
Intentions	.43*	.40*	.40*	-.19*	-.19*	-.04
Behavior	.43	.36*	.22*	-.17*	-.19*	-.04

Note. *$p < .05$. In the scale (1-7) for attitude toward risk behavior, 1 denoted good, desirable, and favorable.

Table 5 (cont'd)

	Fatalism	Hopeless -ness	Reactance	Wishful thinking	Attitude toward risk behavior	Attitude toward recommended behavior	Intentions
Fear							
Threat							
Efficacy							
Defensive avoidance							
Message derogation							
Perceived manipulation							
Fatalism							
Hopelessness	.54*						
Reactance	.33*	.22*					
Wishful thinking	.39*	.42*	.04				
Attitude: risk behavior	-.05	-.06	-.21*	-.05			
Attitude: recommended behavior	-.11	-.00	-.11	-.01	.51*		
Intentions	-.11	.00	-.26*	.20*	.10	.27*	
Behavior	-.03	.07	-.22*	.18	.16*	.20*	.70*

Hypothesis 1

H1 predicted that in general, the magnitude of unintended effects of fear appeals are likely to be greater in earlier stages than later stages. As noted earlier, stages were reduced from five to three. Subsequently, analysis tested the following reformulated hypotheses. H1a: The magnitude of unintended effects is greater in the precontemplation stage than in the contemplation/preparation stage; H1b: The magnitude of unintended effects is greater in the contemplation/preparation stage than in the action/maintenance stage. The results, summarized in Table 6a and 6b, partially support H1.

Results of planned contrast tests are reported first. A significant main effect of stage was found for defensive avoidance (F (2, 267) = 5.16, $p < .01$), perceived manipulation (F (2, 268) = 3.10, $p < .05$), reactance (F (2, 270) = 6.21, $p < .005$), attitude (F (2, 270) = 7.69, $p = .001$), intentions (F (2, 265) = 82.34, $p < .001$), and behavior (F (2, 225) = 28.09, $p < .001$).

Table 6a Mean Differences of Unintended Effects across Stages: Results of Planned Comparison

	Mean Square	F	p
Defensive avoidance	14.14	5.16	.01
Message derogation	2.41	1.68	.19
Perceived manipulation	3.02	3.10	.05
Fatalism	3.79	2.18	.12
Hopelessness	3.97	2.26	.11
Reactance	6.92	6.21	.00
Wishful thinking	1.37	1.04	.35
Attitude	11.61	7.69	.00
Intentions	95.56	82.34	.00
Behavior	41.71	28.09	.00

Significant difference between those in the contemplation/preparation and action/maintenance stage was found for defensive avoidance ($t = -1.65$, $p < .1$), perceived manipulation ($t = -2.39$, $p < .05$), intentions ($t = 3.92$, $p < .001$), and behavior ($t = 3.18$, $p < .01$). Significant difference between those in the precontemplation and contemplation/preparation stage was found for reactance ($t = -2.66$, $p < .01$), attitude, ($t = 3.04$, $p < .005$), intentions ($t = 7.39$, $p < .001$), and behavior ($t = 3.78$, $p < .001$).

Next, results of Tukey-B tests are reported. Table 6b provides a summary.

Table 6b Mean Differences of Unintended Effects across Stages: Results of Tukey-B Tests

	Stage		
	Precontemplation	Contemplation/ Preparation	Action/ Maintenance
Defensive Avoidance	4.52^{a} (1.57)	4.22 (1.63)	3.76^{a} (1.83)
Message Derogation	3.36 (1.28)	3.30 (1.35)	3.13 (1.36)
Perceived Manipulation	2.92 (1.10)	3.05 (1.04)	2.75 (1.25)
Fatalism	2.47^{a} (1.41)	2.00^{a} (1.14)	2.11 (1.28)
Hopelessness	2.71^{a} (1.38)	2.52 (1.23)	2.22^{a} (1.31)
Reactance	3.80^{ab} (1.10)	3.30^{a} (1.01)	3.34^{b} (1.04)
Wishful Thinking	2.73 (1.19)	2.96 (1.09)	2.74 (1.16)
Attitude	4.25^{ab} (1.27)	4.76^{a} (1.13)	4.82^{b} (1.29)
Intentions	2.88^{a} (1.15)	4.11^{ab} (1.06)	4.87^{b} (.93)
Behavior	2.33^{a} (1.23)	3.03^{ab} (1.27)	3.81^{b} (1.13)

Note. $^{a, b}$ indicate significant differences ($p < .05$) in means of each pair.
In parentheses are standard deviations.

Defensive avoidance. A significant mean difference (F (2, 269) = 4.72, $p < .01$) in defensive avoidance was found between precontemplation stage (M = 4.52) and action/maintenance (M = 3.76, $p < .05$) stage. Subjects who did not intend to use sunscreen consistently within the next six months indicated greater defensive avoidance than those who had been using it consistently for more than one month.

Fatalism. A significant difference (F (2, 271) = 3.53, $p < .05$) was found in fatalism between precontemplation stage (M = 2.47) and contemplation/preparation stage (M = 2.00, $p < .05$). Subjects who did not intend to use sunscreen consistently within the next six months indicated greater likelihood of fatalism than those who intended to start using it consistently within the next one to six months.

Hopelessness. A significant mean difference (F (2, 271) = 3.07, $p < .05$) in hopelessness was found between precontemplation stage (M = 2.71) and action/maintenance stage (M = 2.22, $p < .05$). Subjects who did not intend to use sunscreen consistently within the next six months showed greater likelihood of feeling hopeless than those who had been using it consistently for more than one month.

Reactance. Significant mean differences (F (2, 272) = 6.75, $p < .005$) in reactance were found between precontemplation stage (M = 3.80) and contemplation/preparation stage (M = 3.30, $p < .05$) and between precontemplation (M = 3.80) and action/maintenance (M = 3.34, $p < .05$) stages. Subjects who did not intend to use sunscreen consistently within the next six months indicated a stronger likelihood of perceiving that the message was a threat to their freedom than those who intended to use sunscreen within one to six months or those who had used it more than one month.

Attitude. Significant mean differences (F (2, 272) = 6.68, $p < .005$) in attitude were found between precontemplation stage (M = 4.25) and contemplation/preparation stage (M = 4.76, $p < .05$) and between precontemplation (M = 4.25) and action/maintenance (M = 4.82, $p < .05$) stages. Subjects who did not intend to use sunscreen consistently within the next six months indicated less favorable attitude toward recommended behavior than those who intended to use sunscreen within one to six months or those who had used it more than one month.

Intentions. As expected, significant mean differences (F (2, 267) = 82.75, $p < .0001$) in intentions were found between precontemplation (M = 2.88) and contemplation/preparation (M = 4.11, $p < .05$) stages, between contemplation/preparation (M = 4.11) and action/maintenance (M = 4.87, $p < .05$) stages, and between precontemplation (M = 2.88) and action/maintenance (M = 4.87, $p < .05$) stages.

Behavior. In the four-week follow-up, significant mean differences (F (2, 227) = 27.82, $p < .0001$) in behavior were found between precontemplation (M = 2.33) and contemplation/preparation (M = 3.03, $p < .05$) stages, between contemplation/preparation (M = 3.03) and action/maintenance (M = 3.81, $p < .05$) stages, and between precontemplation (M = 2.33) and action/maintenance (M = 3.81, $p < .05$) stages. Subjects who did not intend to use sunscreen consistently within the next six months reported fewer behavioral changes for skin cancer prevention than those who intended to use sunscreen within one to six months or those who had used it more than one month.

No significant differences were discovered among individuals in different stages of change with regard to message derogation (F (2, 271) = .66, p > .05), perceived manipulation (F (2, 270) = 1.21, p > .05), and wishful thinking (F (2, 264) = .92, p > .05).

Hypothesis 2

H2 stated that "When perceived efficacy is low, perceived high threat is likely to bring about greater degree of unintended effects than when perceived efficacy is high." The results partially support H2, and are shown in Table 7.

Defensive avoidance. A significant main effect of efficacy was found for defensive avoidance: F (1, 269) = 4.94, p < .05. A significant covariate was race (F (1, 269) = 9.34, p < .005). No other significant main or interaction effects were found. Subjects who perceived low efficacy indicated greater degree of defensive avoidance (adjusted M = 4.50) than those who perceived high efficacy (adjusted M = 4.04).

Message derogation. A significant interaction between threat and efficacy was found, F = (1, 272) = 5.92, p < .05, for message derogation. Significant covariates were perceived accuracy of message (F (1, 272) = 40.08, p < .001) and minimization of exposure to the sun at midday (F (1, 272) = 5.94, p < .05). When threat was high, subjects who perceived low efficacy indicated greater degree of message derogation (adjusted M = 3.53) than those who perceived high efficacy (adjusted M = 2.86).

Perceived manipulation. A significant main effect of efficacy was found, (F (1, 266) = 4.36, p < .05, for perceived manipulation. Significant covariates for this variable were perceived accuracy of message (F (1, 266) = 60.09, p < .001), friends' use of sunscreen (F (1, 266) = 7.89, p = .005), and number of times peeled for the past two years

(F (1, 266) = 4.60, p < .05). No other significant main or interaction effects were found. Subjects with low perceived efficacy indicated greater degree of perceived manipulation (adjusted M = 3.06) than those with high efficacy (adjusted M = 2.80).

Fatalism. A significant main effect of threat (F (1, 272) = 6.00, p < .05) was found for fatalism. Significant covariates were subjects' current tan level (F (1, 272) = 5.93, p < .05) and family members' (F (1, 272) = 7.43, p < .01) sunscreen use. No other significant main or interaction effects were found. Subjects who were in the high threat condition expressed greater degree of fatalism (adjusted M = 2.47) than those who were in the low threat condition (adjusted M = 2.09).

Hopelessness. A significant main effect of threat (F (1, 272) = 8.92, p < .005) was found for hopelessness. Significant covariates were frequency of workout in the sun (F (1, 272) = 5.80, p < .05) and friends' (F (1, 272) = 9.31, p < .005) and family members' (F (1, 272) = 8.44, p < .005) sunscreen use. No other significant main or interaction effects were found. Subjects who were in the high threat condition expressed greater degree of hopelessness (adjusted M = 2.78) than those who were in the low threat condition (adjusted M = 2.31).

Reactance. A significant main effect of efficacy was found (F (1, 269) = 4.15, p < .05) for reactance. Significant covariates included frequency of leisure activities in the sun (F (1, 269) = 10.51, p < .01) and perceived amount of learning from message (F (1, 269) = 6.01, p < .05). No other significant main or interaction effects were found. Subjects who perceived low efficacy indicated greater reactance (adjusted M = 3.67) than those who perceived high efficacy (adjusted M = 3.41).

Wishful thinking. A significant main effect of threat was found (F (1, 265) = 18.99, $p < .001$) for wishful thinking. No other significant main or interaction effects were detected. A significant covariate was perceived accuracy of the message (F (1, 265) = 3.93, $p = .05$). Subjects who were in the high threat condition showed greater tendency of wishful thinking (adjusted M = 3.06) than those who were in the low threat condition (adjusted M = 2.51).

Attitude. A significant main effect of efficacy (F (1, 272) = 11.25, $p = .001$) was found for attitude toward recommended behavior. Significant covariates included use of protective clothing (F (1, 272) = 8.59, $p < .005$) and minimization of sun exposure at midday (F (1, 272) = 6.95, $p < .01$). No other significant main or interaction effects were found. Subjects who perceived low efficacy indicated less favorable attitude (adjusted M = 4.28) toward recommended behavior than those who perceived high efficacy (adjusted M = 4.75).

Intentions. A significant interaction between threat and efficacy was found for intentions: F (1, 265) = 4.69, $p < .05$. Significant covariates were minimization of exposure to the sun at midday (F (1, 265) = 53.98, $p < .001$) and preexisting sunscreen use including frequency of use (F (1, 265) = 12.81, $p < .001$) and reapplication every two hours (F (1, 272) = 11.42, $p < .001$). Subjects who were exposed to the high threat message indicated fewer intentions to engage in preventive behavior when perceived efficacy was low (adjusted M = 3.48) than when perceived efficacy was high (adjusted M = 4.25).

Behavior. In the four-week follow-up, a significant main effect of threat was found (F (1, 227) = 19.45, $p < .001$) for behavior. No other significant main or interaction effects were found. Significant covariates were preexisting protective behavior such as use of protective clothing when out in the sun (F (1, 227) = 13.76, $p < .001$) and minimization of sun exposure at midday (F (1, 227) = 6.01, $p < .05$). Subjects who had been in the high threat condition reported greater behavioral change for skin cancer prevention (adjusted M = 3.18) than those who were in the low threat condition (adjusted M = 2.50).

Table 7 Summary of Analysis of Covariance of Threat x Efficacy and Adjusted Means

a. Defensive Avoidance

Source of Variation	df	Mean Square	F	p
Covariate	1	25.68	9.34	.00
Threat	1	.39	.14	.71
Efficacy	1	13.59	4.94	.03
Threat x efficacy	1	5.38	1.96	.16
Error	265	2.75		

Note. Significant covariate was race.

		Threat	
		Low	High
Efficacy	Low	4.32	4.68
	High	4.14	3.93

b. Message Derogation

Source of Variation	df	Mean Square	F	p
Covariate 1	1	55.62	40.08	.00
Covariate 2	1	8.24	5.94	.02
Threat	1	2.86	2.06	.15
Efficacy	1	6.42	4.63	.03
Threat x efficacy	1	8.21	5.92	.02
Error	267	1.39		

Note. Significant covariates were perceived accuracy of the message and minimization of sun exposure at midday, respectively.

		Threat	
		Low	High
Efficacy	Low	3.39	3.53
	High	3.42	2.86

c. Perceived Manipulation

Source of Variation	df	Mean Square	F	p
Covariate 1	1	58.41	60.69	.00
Covariate 2	1	7.59	7.89	.01
Covariate 3	1	4.42	4.59	.03
Threat	1	.67	.70	.40
Efficacy	1	4.20	4.36	.04
Threat x efficacy	1	1.50	1.56	.21
Error	260	.96		

Note. Significant covariates were perceived accuracy of the message, friends' use of sunscreen, and number of times peeled during the past two years, respectively.

		Threat	
		Low	High
Efficacy	Low	3.03	3.08
	High	2.93	2.67

d. Fatalism

Source of Variation	df	Mean Square	F	p
Covariate 1	1	12.45	7.43	.01
Covariate 2	1	9.92	5.93	.02
Threat	1	10.05	6.00	.02
Efficacy	1	3.00	1.78	.18
Threat x efficacy	1	4.58	2.73	.10
Error	267	1.68		

Note. Significant covariates were level of family members' use of sunscreen and level of tan, respectively.

		Threat	
		Low	High
Efficacy	Low	2.07	2.72
	High	2.12	2.24

e. Hopelessness

Source of Variation	df	Mean Square	F	p
Covariate 1	1	15.15	9.31	.00
Covariate 2	1	13.72	8.44	.00
Covariate 3	1	9.43	5.80	.02
Threat	1	14.52	8.92	.00
Efficacy	1	4.20	2.58	.11
Threat x efficacy	1	.16	.10	.76
Error	266	1.63		

Note. Significant covariates were friends use of sunscreen, family members' use of sunscreen, and frequency of workout in the sun, respectively.

		Threat	
		Low	High
Efficacy	Low	2.47	2.89
	High	2.16	2.68

f. Reactance

Source of Variation	df	Mean Square	F	p
Covariate 1	1	11.60	10.51	.00
Covariate 2	1	6.05	6.02	.02
Threat	1	1.80	1.63	.20
Efficacy	1	4.58	4.15	.04
Threat x efficacy	1	.05	.05	.83
Error	264	1.10		

Note. Significant covariates were amount of time spent for leisure activities in the sun and perceived amount of learning from the message, respectively.

		Threat	
		Low	High
Efficacy	Low	3.77	3.57
	High	3.48	3.34

g. Wishful Thinking

Source of Variation	df	Mean Square	F	p
Covariate	1	4.89	3.93	.05
Threat	1	18.72	15.02	.00
Efficacy	1	.001	.001	.98
Threat x efficacy	1	.10	.08	.78
Error	261	1.25		

Note. Significant covariate was perceived accuracy of message.

		Threat	
		Low	High
Efficacy	Low	2.50	3.08
	High	2.53	3.07

h. Attitude

Source of Variation	df	Mean Square	F	p
Covariate 1	1	11.12	8.59	.00
Covariate 2	1	9.00	6.95	.01
Threat	1	1.22	.94	.33
Efficacy	1	14.56	11.25	.00
Threat x efficacy	1	1.78	1.37	.24
Error	267	1.29		

Note. Significant covariates were use of protective clothing when out in the sun and minimization of sun exposure at midday, respectively.

		Threat	
		Low	High
Efficacy	Low	4.43	4.13
	High	4.74	4.77

i. Intentions

Source of Variation	df	Mean Square	F	p
Covariate 1	1	25.49	26.77	.00
Covariate 2	1	12.19	12.81	.00
Covariate 3	1	10.87	11.42	.00
Threat	1	11.18	11.74	.00
Efficacy	1	14.75	15.49	.00
Threat x efficacy	1	4.47	4.69	.03
Error	259	.95		

Note. Significant covariates were frequency of sunscreen use, minimization of sun exposure at midday, and reapplication of sunscreen every two hours, respectively.

		Threat	
		Low	High
Efficacy	Low	3.33	3.48
	High	3.57	4.25

j. Behavior

Source of Variation	df	Mean Square	F	p
Covariate 1	1	18.82	13.76	.00
Covariate 2	1	8.22	6.01	.02
Threat	1	26.60	19.45	.00
Efficacy	1	2.94	2.15	.14
Threat x efficacy	1	.51	.37	.54
Error	222	1.37		

Note. Significant covariates were use of protective clothing when out in the sun and minimization of sun exposure at midday, respectively.

		Threat	
		Low	High
Efficacy	Low	2.43	3.02
	High	2.57	3.35

Hypothesis 3

H3a stated that "When perceived response efficacy is low, perceived high threat is likely to bring about greater degree of fatalism than when perceived response efficacy is high." The results are described in Table 8a and 8b. Significant main effects of threat (F (1, 272) = 4.80, $p < .05$) and response efficacy (F (1, 272) = 6.76, $p = .01$) were found for fatalism. Significant covariates were race (F (1, 272) = 4.34, $p < .05$) and the level of tan (F (1, 272) = 6.28, $p < .05$). No significant interaction effect was found. Subjects who were in the high threat condition expressed greater degree of fatalism (adjusted M = 2.45) than those who were in the low threat condition (adjusted M = 2.11). At the same time, subjects who perceived low response efficacy indicated greater degree of fatalism (adjusted M = 2.49) than those who perceived high response efficacy (adjusted M = 2.07).

H3b stated that "When perceived self efficacy is low, perceived high threat is likely to bring about greater degree of hopelessness than when perceived self efficacy is high." Significant main effects of threat (F (1, 272) = 18.18, $p = .005$) and self efficacy (F (1, 272) = 7.80, $p < .01$) were found for hopelessness. A significant covariate was frequency of workout in the sun (F (1, 272) = 8.19, $p = .005$). No significant interaction effect was found. Subjects who were in the high threat condition indicated greater degree of hopelessness (adjusted M = 2.63) than those who were in the low threat condition (adjusted M = 2.30), while subjects who perceived low self efficacy greater degree of hopelessness (adjusted M = 2.76) than those who perceived high self efficacy (adjusted M = 2.32).

Table 8a Summary of Analysis of Covariance of
Threat x Response Efficacy and Adjusted Means for Fatalism

Source of Variation	df	Mean Square	F	p
Covariate 1	1	11.47	6.95	.01
Covariate 2	1	8.58	5.20	.02
Threat	1	10.25	6.21	.01
Response efficacy	1	10.16	6.16	.01
Threat x efficacy	1	3.81	2.31	.13
Error	267	1.65		

Note. Significant covariates were family members' use of sunscreen and level of tan, respectively.

		Threat	
		Low	High
Efficacy	Low	2.17	2.80
	High	2.02	2.17

Table 8b Summary of Analysis of Covariance of Threat x Self Efficacy and Adjusted Means for Hopelessness

Source of Variation	df	Mean Square	F	p
Covariate 1	1	19.69	12.41	.00
Covariate 2	1	14.63	9.22	.00
Covariate 3	1	12.50	7.88	.01
Covariate 4	1	7.24	4.57	.03
Threat	1	15.95	10.05	.00
Efficacy	1	7.20	4.54	.03
Threat x efficacy	1	1.19	.75	.39
Error	265	1.59		

Note. Significant covariates were family members' use of sunscreen, friends' use of sunscreen, frequency of workout, and level of tan, respectively.

		Threat	
		Low	High
Efficacy	Low	2.53	2.88
	High	2.07	2.69

Hypothesis 4

H4 stated that "When perceived threat is low, attitude toward risk behavior is likely to be more favorable when response efficacy is low than when response efficacy is high." ANCOVA method was used to test this hypothesis. This hypothesis was not supported. No significant main effect of threat (F (1, 272) = 1.80, p = ns) or efficacy (F (1, 272) = .00, p = ns) or interaction (F (1, 272) = , p = ns) was discovered. Significant covariates were frequency of going to a tanning parlor (F (1, 272) = 63.49, p = .001), level of tan (F (1, 272) = 11.62, p = .001), minimization of exposure to the sun at midday (F (1, 272) = 5.23, p < .05), and use of protective clothing (F (1, 272) = 4.66, p < .05). Results are described in Table 9.

Table 9 Summary of Analysis of Covariance of Threat x Response Efficacy and Adjusted Means for Attitude toward Risk Behavior

Source of Variation	df	Mean Square	F	p
Covariate 1	1	98.78	64.00	.00
Covariate 2	1	18.07	11.71	.00
Covariate 3	1	8.03	5.20	.02
Covariate 4	1	7.24	4.69	.03
Threat	1	1.19	.76	.38
Efficacy	1	.01	.00	.95
Threat x efficacy	1	.07	.05	.83
Error	265	1.54		

Note. Significant covariates were frequency of going to a tanning parlor, level of tan, minimization of sun exposure at midday, and use of protective clothing when out in the sun, respectively.

		Threat	
		Low	High
Efficacy	Low	3.57	3.67
	High	3.55	3.72

Research Question 1

RQ1 asked, "How do threat, efficacy, and stages of change interact in bringing about unintended effects?" The results are presented in Table 10.

Defensive avoidance. A significant main effect of stage was found for defensive avoidance: F (2, 269) = 3.60, $p < .05$. No other significant main or interaction effects were found. A significant covariate was frequency of going to a tanning parlor: F (1, 272) = 25.71, $p < .001$. Subjects in the precontemplation stage indicated greater degree of defensive avoidance (adjusted M = 4.57) than those in the contemplation/preparation stage (adjusted M = 4.30), who in turn indicated greater degree of defensive avoidance than those in the action/maintenance stage (adjusted M = 3.89), regardless of threat or efficacy levels.

Message derogation. A significant interaction between threat and efficacy was found, F (1, 271) = 10.10, $p < .005$, for message derogation. Significant covariates were perceived accuracy of the message (F (1, 272) = 30.51, $p < .001$) and minimization of sun exposure at midday message (F (1, 272) = 4.76, $p < .05$). When threat was high, subjects indicated greater degree of message derogation when perceived efficacy was low (adjusted M = 4.15) than when perceived efficacy was high (adjusted M = 2.90).

Perceived manipulation. A significant interaction between threat and efficacy was found for perceived manipulation: F (1, 264) = 4.92, $p < .05$. Significant main effects of stage (F (2, 264) = 3.62, $p < .05$) was also found. Significant covariates were perceived accuracy (F (1, 264) = 22.76, $p < .001$) and quality (F (1, 264) = 5.56, $p < .05$) of the message, friends' use of sunscreen (F (1, 264) = 7.75, $p < .01$), and number of times

peeled during the past two years (F (1, 264) = 4.70, $p < .05$). When threat was high, subjects who perceived low efficacy indicated greater degree of perceived manipulation (adjusted M = 3.27) than those who perceived high efficacy (adjusted M = 2.65). Subjects in precontemplation (adjusted M = 2.98) and contemplation/preparation (adjusted M = 3.13) stages indicated greater degree of perceived manipulation than those who were in action/maintenance stage (adjusted M = 2.66).

Fatalism. A significant main effect of threat was found for fatalism: F (1, 271) = 5.78, $p < .05$. No other significant main or interaction effects were found. Significant covariates were level of tan (F (1, 271) = 7.49, $p < .01$) and family members' use of sunscreen (F (1, 264) = 4.20, $p < .05$). Subjects who were in the high threat condition (adjusted M = 2.42) indicated greater level of fatalism than those who were in the low threat condition (adjusted M = 1.99) across different stages of change and levels of efficacy.

Hopelessness. A significant main effect of threat was found for hopelessness: F (1, 271) = 13.15, $p < .001$. No other significant main or interaction effects were found. Significant covariates were friends' (F (1, 271) = 9.09, $p < .005$) and family members' (F (1, 271) = 4.76, $p < .05$) sunscreen use and frequency of workout in the sun F (1, 271) = 5.64, $p < .05$. Subjects who were in the high threat condition indicated greater level of hopelessness (adjusted M = 2.82) than those who were in low threat condition (adjusted M = 2.19) across different stages of change and levels of efficacy.

Reactance. A significant main effect of stage was found, F (1, 268) = 4.55, $p < .05$, for reactance. No other significant main or interaction effects were found.

Significant covariates were amount of time spent per week for leisure activities in the sun during summer (F (1, 268) = 8.84, $p < .01$) and perceived amount of learning from the message (F (1, 268) = 5.26, $p < .05$). Subjects in precontemplation stage indicated greater degree of reactance (adjusted M = 3.73) than those in contemplation/preparation stage (adjusted M = 3.36) who in turn indicated greater reactance than those in action/maintenance stage (adjusted M = 3.29), regardless of the levels of threat or efficacy.

Wishful thinking. A significant main effect of threat was obtained, F (1, 264) = 12.23, $p = .001$, for wishful thinking. No other significant main or interaction effects were found. A significant covariate was perceived accuracy of the message (F (1, 264) = 4.57, $p < .05$). Subjects in the high threat condition indicated greater degree of wishful thinking (adjusted M = 3.05) than who were in the low threat condition (adjusted M = 2.48), across stages of change and levels of efficacy.

Attitude. A significant main effect of efficacy was found, F (1, 271) = 6.63, $p <$ .05, for attitude. No other significant main or interaction effects were found. Significant covariates were frequency of going to a tanning parlor (F (1, 271) = 7.10, $p < .01$), use of protective clothing (F (1, 271) = 5.13, $p < .05$), and minimization of sun exposure at midday (F (1, 271) = 5.41, $p < .05$). Subjects who perceived low efficacy indicated less favorable attitude toward recommended behavior (adjusted M = 4.37) than those who perceived high efficacy (adjusted M = 4.77), across different stages of change and levels of threat.

Intentions. A significant interaction between threat and efficacy was found, F (1, 263) = 5.89, $p < .05$, for intentions to engage in preventive behavior. Significant main effects of stage (F (1, 263) = 16.15, $p < .001$) was also found. Significant covariates were minimization of sun exposure at midday (F (1, 263) = 10.92, $p = .001$), frequency of sunscreen use (F (1, 263) = 8.39, $p < .005$), and reapplication of sunscreen every two hours (F (1, 263) = 5.44, $p < .05$). Subjects indicated fewer intentions to engage in preventive behavior when threat was high and perceived efficacy was low (adjusted M = 3.72) than perceived efficacy was high (adjusted M = 4.46). Subjects in precontemplation stage indicated fewer intentions (adjusted M = 3.34) than those in contemplation/preparation stage (adjusted M = 3.89) who in turn indicated fewer intentions than those in action/maintenance stage (adjusted M = 4.38).

Behavior. Significant main effects of stage (F (2, 226) = 24.81, $p < .001$) and threat (F (1, 226) = 18.33, $p < .001$) were found for behavior. No other significant main or interaction effects were found. A significant covariate was use of protective clothing when exposed to the sun (F (1, 226) = 37.06, $p < .001$). Subjects in precontemplation stage reported fewer behavioral changes (adjusted M = 2.41) than those in contemplation/preparation stage (adjusted M = 2.86) who in turn reported fewer behavioral changes than those in action/maintenance stage (adjusted M = 3.77). Fewer behavioral changes were made when threat was low (adjusted M = 2.66) than high (adjusted M = 3.37).

Table 10 Summary of Analysis of Covariance of Stage x Threat x Efficacy and Adjusted Means

a. Defensive Avoidance

Source of Variation	df	Mean Square	F	p
Covariate	1	64.56	25.71	.00
Stage	2	9.03	3.60	.03
Threat	1	1.43	.57	.45
Efficacy	1	3.74	1.49	.22
Stage x threat	2	.30	.12	.89
State x efficacy	2	5.17	2.06	.13
Threat x efficacy	1	7.87	3.13	.08
Stage x threat x efficacy	2	.24	.09	.91
Error	257			

Note. Significant covariate was frequency of going to tanning parlor.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	4.24	4.63	4.22	4.73	3.86	4.64
	High	4.86	4.53	4.15	4.09	3.68	3.39

b. Message Derogation

Source of Variation	df	Mean Square	F	p
Covariate 1	1	52.81	38.51	.00
Covariate 2	1	6.53	4.76	.03
Stage	2	1.49	1.09	.34
Threat	1	.44	.32	.57
Efficacy	1	7.91	5.77	.02
Stage x threat	2	.61	.44	.64
State x efficacy	2	2.69	1.96	.143
Threat x efficacy	1	13.85	10.101	.00
Stage x threat x efficacy	2	2.75	2.01	.14
Error	258	1.37		

Note. Significant covariates were perceived accuracy of the message and minimization of sun exposure at midday.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	3.45	3.27	3.44	4.15	3.16	3.89
	High	3.55	3.16	3.60	2.90	3.24	2.50

c. Perceived Manipulation

Source of Variation	df	Mean Square	F	p
Covariate 1	1	20.93	22.76	.00
Covariate 2	1	7.13	7.75	.01
Covariate 3	1	5.11	5.56	.02
Covariate 4	1	4.32	4.70	.03
Stage	2	3.33	3.62	.03
Threat	1	.23	.25	.62
Efficacy	1	4.94	5.37	.02
Stage x threat	2	.97	1.06	.35
State x efficacy	2	.79	.86	.43
Threat x efficacy	1	4.52	4.92	.03
Stage x threat x efficacy	2	2.55	2.77	.06
Error	249	.92		

Note. Significant covariates were perceived accuracy of the message, friends' use of sunscreen, perceived quality of the message, and number of times peeled during the previous two years.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	3.11	3.01	3.25	3.59	2.34	3.21
	High	3.01	2.78	2.75	2.94	2.87	2.22

d. Fatalism

Source of Variation	df	Mean Square	F	p
Covariate 1	1	12.55	7.49	.01
Covariate 2	1	7.03	4.20	.04
Stage	2	3.84	2.29	.10
Threat	1	9.68	5.78	.02
Efficacy	1	2.86	1.71	.19
Stage x threat	2	.75	.45	.64
State x efficacy	2	.49	.29	.75
Threat x efficacy	1	3.67	.2.19	.14
Stage x threat x efficacy	2	.01	.01	.99
Error	258	1.68		

Note. Significant covariates were family members' use of sunscreen and level of tan.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	2.17	2.78	1.67	2.65	2.08	2.60
	High	2.35	2.47	1.62	2.02	2.05	2.02

e. Hopelessness

Source of Variation	df	Mean Square	F	p
Covariate 1	1	14.77	9.09	.00
Covariate 2	1	9.15	5.64	.02
Covariate 3	1	7.73	4.76	.03
Stage	2	.73	.45	.64
Threat	1	21.35	13.15	.00
Efficacy	1	4.94	3.04	.08
Stage x threat	2	3.88	2.39	.09
State x efficacy	2	1.57	.97	.38
Threat x efficacy	1	.88	.54	.46
Stage x threat x efficacy	2	1.24	.76	.47
Error	257	1.62		

Note. Significant covariates were friends' use of sunscreen, frequency of workout in the sun, and family members' use of sunscreen.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	2.60	2.63	2.03	3.34	2.18	3.17
	High	2.45	2.76	1.96	2.62	1.86	2.43

f. Reactance

Source of Variation	df	Mean Square	F	p
Covariate 1	1	9.46	8.84	.00
Covariate 2	1	5.63	5.26	.02
Stage	2	4.86	4.55	.01
Threat	1	.02	.02	.89
Efficacy	1	1.47	1.38	.24
Stage x threat	2	.38	.35	.70
State x efficacy	2	.42	.40	.67
Threat x efficacy	1	.10	.09	.77
Stage x threat x efficacy	2	1.89	1.76	.17
Error	255	1.07		

Note. Significant covariates were frequency of leisure activities in the sun and perceived amount of learning.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	3.97	3.58	3.48	3.60	3.15	3.49
	High	3.64	3.72	3.10	3.25	3.49	3.05

g. Wishful Thinking

Source of Variation	df	Mean Square	F	p
Covariate	1	5.82	4.57	.03
Stage	2	.52	.41	.67
Threat	1	15.56	12.23	.00
Efficacy	1	.00	.00	1.00
Stage x threat	2	.00	.00	1.00
State x efficacy	2	.44	.35	.71
Threat x efficacy	1	.54	.43	.51
Stage x threat x efficacy	2	1.21	.95	.39
Error	252	1.27		

Note. Significant covariate was perceived accuracy of the message.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	2.53	3.04	2.62	3.16	2.12	3.10
	High	2.33	2.98	2.54	3.16	2.72	2.85

h. Attitude

Source of Variation	df	Mean Square	F	p
Covariate 1	1	8.99	7.10	.01
Covariate 2	1	6.86	5.41	.02
Covariate 3	1	6.50	5.13	.02
Stage	2	2.79	2.20	.11
Threat	1	.79	.62	.43
Efficacy	1	8.39	6.63	.01
Stage x threat	2	.71	.52	.57
State x efficacy	2	.22	.17	.84
Threat x efficacy	1	.52	.41	.52
Stage x threat x efficacy	2	.68	.56	.59
Error	257	1.27		

Note. Significant covariates were frequency of going to a tanning parlor, minimization of sun exposure at midday, and use of protective clothing.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	4.45	3.95	4.31	4.56	4.68	4.25
	High	4.57	4.51	5.00	4.96	4.79	4.82

i. Intentions

Source of Variation	df	Mean Square	F	p
Covariate 1	1	9.33	10.92	.00
Covariate 2	1	7.17	8.39	.00
Covariate 3	1	4.65	5.44	.02
Stage	2	13.81	16.15	.00
Threat	1	9.63	11.26	.00
Efficacy	1	8.32	9.73	.00
Stage x threat	2	1.20	1.40	.25
State x efficacy	2	.23	.27	.77
Threat x efficacy	1	5.04	5.89	.02
Stage x threat x efficacy	2	.02	.02	.98
Error	250	.86		

Note. Significant covariates were minimization of sun exposure at midday, frequency of using sunscreen, and reapplication of sunscreen every two hours when out in the sun.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	3.09	3.20	3.53	3.94	4.18	4.03
	High	3.19	3.86	3.49	4.61	4.42	4.91

j. Behavior

Source of Variation	df	Mean Square	F	p
Covariate	1	43.37	37.06	.00
Stage	2	29.03	24.81	.00
Threat	1	21.45	18.33	.00
Efficacy	1	.005	.005	.95
Stage x threat	2	.29	.24	.78
State x efficacy	2	.74	.64	.53
Threat x efficacy	1	.40	.34	.56
Stage x threat x efficacy	2	.10	.09	.92
Error	214	1.17		

Note. A significant covariate was use of protective clothing when out in the sun.

		Stage					
		Precontemplation		Contemplation/ Preparation		Action/ maintenance	
		Threat					
		Low	High	Low	High	Low	High
Efficacy	Low	2.19	2.73	2.37	3.06	3.55	4.16
	High	2.01	2.72	2.47	3.54	3.37	4.01

Research Question 2

RQ2 asked, "How are unintended effects associated with intended effects?" Partial correlations, controlling for confounds, were run to answer this research question, as summarized in Table 11.

Defensive avoidance was negatively associated with attitude (r = -.20, p <.01), intentions (r = -.19, p <.01), and behavior (r = -.17, p <.05). Reactance was also negatively related to attitude (r = -.14, p <.05), intentions (r = -.28, p <.001), and behavior (r = -.24, p <.001). The more subjects engaged in defensive avoidance or perceived the messages were threats to their freedom, the fewer changes in attitude, intentions, and behavior were made. Similarly, message derogation was inversely related to intentions (r = -.19, p <.01) and behavior (r = -.23, p = .001). The more subjects derogated the message the fewer changes in intentions or behavior were made.

In contrast, wishful thinking was positively associated with intentions (r = .23, p = .001) and behavior (r = -.23, p = .001). The more individuals wished for panaceas after exposure to the threat messages, the more changes in intentions and behavior toward prevention were made. Perceived manipulation, fatalism, and hopelessness were not related to intended effects.

Table 11 Results of Partial Correlations between Unintended and Intended Effects

	Intended Effects		
Unintended Effects	Attitude	Intention	Behavior
Defensive avoidance	-.20**	-.19***	-.17*
Message derogation	-.06	-.19**	-.23**
Perceived manipulation	-.00	-.07	-.05
Fatalism	-.12	-.10	-.02
Hopelessness	-.02	.01	.08
Reactance	-.14*	-.28***	-.24***
Wishful thinking	.00	.23***	.23***

* $p < .05$
** $p \leq .01$
*** $p \leq .005$

CHAPTER 5

DISCUSSION

The results of this study illustrate an interplay of threat, efficacy, and stages of change that may elicit unanticipated consequences of fear appeals in health communication campaigns.

The Role of Stage of Change

The results of H1 highlights the importance of considering dynamic audience characteristics, stages of change, in effective message design. Findings indicate that in general, unintended effects of fear appeals are more likely to occur in earlier stages of behavior change than in mid or later stages of change.

Specifically, after being exposed to fear appeal messages, college students who were in the precontemplation stage were more likely to: avoid the thoughts of skin cancer and its prevention, be fatalistic about the threat of skin cancer, feel hopeless, and perceive that the messages were constraining their behavioral freedom, than those who were in the contemplation/preparation stage or the action/maintenance stage.

At the same time, after being exposed to fear appeal messages, those who were in the precontemplation stage reported less favorable attitude toward message recommendations, fewer intentions to engage in preventive behavior, and fewer changes in preventive behavior.

The results of H1 hold significant implications as well as challenges for message designers. Those who do not engage or who do not intend to engage in preventive

behavior may be the major intended audience of health communication campaigns, and need communication campaigns most. The results indicated, however, that this group of individuals are most likely to exhibit unintended effects of fear appeals.

Concurrently, findings of H1 are reminiscent of a long-held view on the effects of persuasion in general, that creating responses is more difficult than reinforcing existing responses (Klapper, 1960; Stiff, 1994). Of all the stages, individuals in the precontemplation stage may need changes in attitude, intentions, and behavior most because they do not at all intend to or engage in preventive behavior. However, results indicate that this group of individuals are least likely to respond with intended changes after having been exposed to fear appeals. At the same time, individuals in the contemplation/preparation stage or action/maintenance stage, who have already intended or engaged in preventive behavior indicate greater changes in intended attitude, intentions, and behavior than those in precontemplation stage. Therefore, fear appeals used in this study appears to have been more effective in reinforcing existing intentions and behavior than eliciting new attitude, intentions, and behavior among those who need such change.

The importance of these findings can be underscored by noting that most often, the majority of any at-risk population are at precontemplation stage (Prochaska, 1994). Specifically, Prochaska stated that those who do not intend to change behavior in the near future typically comprises 50% of any given population. In this study, about 52% of subjects were precontemplators (see Table 3).

Then, what can planners of health communication campaigns do to minimize possibility of unintended effects among precontemplators? Why is it that those who do not plan behavioral changes are more prone to responses unintended by prevention messages using fear appeals? By the same token, why are those who plan and implement behavioral changes more likely to report intended responses? Other findings of this study provide some understanding.

Results of RQ1 indicate that for some type of unintended effects, stages of change alone can determine their magnitude. Specifically, stage of change was an overriding factor determining the magnitude of defensive avoidance and reactance. Therefore, the refusal to change and insistence on risk-related behavior may be an outcome of avoidance of thoughts on risk and its prevention or resistance against communication that appears to delimit their behavioral freedom. As a result, those individuals may have less knowledge than those in contemplation/preparation stage or action/maintenance stage.

The TM characterizes precontemplators as those who are do not recognize their risk or who refuse to acknowledge risk or who do not want to undertake healthier behavior (Prochaska et al., 1994). Results of RQ1 lend support to these characterizations, suggesting that the obstinacy of such audience in health/risk communication contexts may come from their avoidance and reactance tendency. Future fear appeal messages for precontemplators should be designed in a way that the audience would not perceive as being prohibitive. On the other hand, the tendency of avoidance among precontemplators may be a manifestation of their lack of perceived efficacy. Because precontemplators are those who have not engaged in preventive behavior, they would not be as confident as

others in their ability to perform message recommendations. For this reason, they may like to avoid think about the risk that may be relevant to them.

The Role of Efficacy

The results of H2 suggest that even after being exposed to information and aware of threat, individuals may still display unanticipated responses to fear appeals, however. Although the TM does not provide systematic characterizations of individuals in different stages of change, studies of the model (Gorely & Gordon, 1995; Grimley et al., 1993; Marcus et al., 1994; Prochaska et al., 1990) have found a consistent pattern across a dozen different types of behavior: As individuals move from the precontemplation to the maintenance stage, self efficacy and response efficacy increase. And, the EPPM predicts that intended changes in attitude, intentions, and behavior are not likely to occur when perceived efficacy is lower than perceived threat.

The results of H2 and H3 illustrate that whether fear appeals in health communication campaigns will produce intended or unintended effects is largely determined by the level of perceived efficacy. Even though the threat was perceived as severe and relevant, college students indicated the likelihood of derogating the fear-arousing messages about skin cancer and expressing fewer intentions to engage in behavioral changes, when perceived efficacy was low.

Further, when perceived efficacy was low, college students tried to avoid the thoughts of skin cancer and its prevention, believed that the message was manipulative and restricting their behavioral choices, and expressed less favorable attitude toward

message recommendations than when perceived efficacy was high, regardless of perceived threat level.

In addition, this study found that lack of different type of efficacy result in different kind of unintended effects. Perceived efficacy comprises two distinct dimensions of self efficacy and response efficacy (Witte, 1992b). When college students believed that message recommendations are not efficacious in averting the threat, they became fatalistic, by just accepting the threat as a fact of life. On the other hand, when they believed that they are not able to perform recommended behavior, college students felt as if they were without hope (H3a, H3b).

Also, results of RQ1 lend further support to the above reasoning that lack of efficacy makes unintended effects more conspicuous in earlier stages. Even after stages of change was considered as a factor eliciting unintended effects (i.e., in stage x threat x efficacy ANCOVA), efficacy still remained as a key factor determining the effects and effectiveness of fear appeals. Specifically, message derogation, perceived manipulation, and intentions emerged as outcomes of interaction between threat and efficacy, and efficacy was the determinant of attitude toward recommended behavior, across different stages of change.

The obvious implication for planners of health communication campaigns is that in fear appeals should convince that message recommendations are efficacious in deterring the risk and that the audience is capable of performing the recommendations.

Individuals in action/maintenance stages can have reinforcement on their

perceived efficacy from their own trial and repeat exercise of recommended behavior, as studies suggest (Fruin et al., 1991; Schafer et al., 1993).

For those who have yet to initiate behavior change, fear appeal messages will play a primary role in persuading them about efficacy. That neither self efficacy nor response efficacy are personality traits (Bandura, 1986) suggests campaigns can create intended changes.

The Role of Threat

Overall, the results indicate that perceived threat can energize both intended and unintended effects of fear appeals, and this is consistent with Rippetoe and Rogers' (1987) and Witte's (1992a) findings. First, the hypothesized boomerang effect of low threat changing attitude toward risk behavior more favorable was not supported (H4). When threat was not perceived as significant or relevant, no changes in attitude toward risk behavior occurred, even though message recommendations were not believed as efficacious. As the EPPM predicts, low threat might not motivate either intended or unintended responses.

Next, results indicate that high threat can energize either intended or unintended effects. The likelihood of wishing for panacea was amplified when the level of perceived threat was high, regardless of the level of efficacy. At the same time, more behavioral changes were reported when perceived threat was high (RQ1).

Therefore, simply lowering the level of threat may not bring about any changes at all, either intended or unintended. Lowering the level of threat to reduce unintended effects may mean losing the potential to produce intended effects, because low threat

results in null effects. To elicit intended changes for prevention, first of all, a health risk should be portrayed to an audience as significant and relevant. While keeping the level of threat sufficiently high, message designers should take a great deal of care to tailor fear appeals to their audience's efficacy level, to elicit intended effects and to minimize the potential of unintended effects.

Relationship between Unintended and Intended Effects

Determining the relationship between unintended effects and intended effects would provide an understanding of the seriousness of the former. Unintended effects would be most unwholesome when they interfere the occurrence of intended effects.

Results of RQ2 indicate that defensive avoidance, message derogation, and reactance are the most adverse of all types of unintended effects, because they decrease the likelihood of intended effects, including attitude, intentions, and behavior. Importantly, the magnitude of defensive avoidance and reactance were mainly determined by the stages of change individuals were in (RQ1). Therefore, future research should examine what makes precontemplators avoid the thoughts of risk and its prevention and to react and to remain resistant to fear appeals messages.

Results also suggest that not all unintended effects of fear appeals are deleterious: Wishful thinking was positively associated with intentions and behavior. Wishful thinking is a mode of coping threat (McCrae, 1984). Because fear appeals are used in health communication campaigns to change attitude, intentions, and behavior, wishful thinking in and of itself can be an unanticipated, undesirable response.

However, it is not without salutary effects because it helps individuals to deal with the emotional distress facing threat (Rippetoe & Rogers, 1987). Moreover, it seems that wishful thinking does not hinder individuals from engaging in rational problem-solving approach, as it strengthened the likelihood of behavior change.

How about fatalism, hopelessness, and perceived manipulation, which were not associated with intended effects? Can they be safely ignored because they do not affect intended responses negatively? Although this study found no relationship, another study found fatalism energized risk behavior of AIDS among gay and bisexual men (Kalichman et al., 1997). Future research should determine the type and magnitude of unintended effects' impact on intended effects in diverse health issues.

Implications

The discussion of implications of this study should be preceded by the fact that the magnitude of unintended effects was relatively smaller than that of intended effects (see Table 5). Thus, although significant differences were found among stages as predicted, they may represent "potential" of unintended effects, rather than "actual" unintended effects.

However, the relatively small magnitude of unintended effects may stem from the characteristics of the health issue examined in this study: skin cancer. Skin cancer may be more preventable than diseases such as breast cancer, and the impact of sun exposure on skin cancer is more cumulative (especially for the subjects of this study who were college students) when compared to that of unprotected sex on AIDS. Therefore, the

magnitude difference between unintended and intended effects should not be taken as representative of fear appeals advocating all kinds of disease prevention.

Then, what should designers of public health campaigns do if they are aware that they are likely to cause some unintended effects? Should communicators avoid communicating altogether because they might cause harm to some audiences? This may not be the best solution because doing so may mean loss of other audiences' opportunity to be exposed to and to benefit from health information. For example, in this study, fear appeals were likely to reinforce individuals in action/maintenance stage's preventive behavior, while showing the potential to induce unintended effects among precontemplators.

In this light, a question that health communication campaigners should ponder upon regarding the potential of unintended effects may be "whose good and whose harm." Next, health communication campaigners should also determine how much good would be good enough for them to communicate and how much harm would constitute enough reason to not communicate to a given type of audience.

To do so, planners of health communication campaigns should clearly define objectives. Like objectives of any campaigns, a health communication objective should include measurable goals, target audience, and time frame. Clearly defining target audience is important because a message that has the potential to produce negative unintended effects for a type of audience may not do so for another type of audience. For example, should fear appeal messages' potential of producing unintended effects among precontemplators deter its delivery to maintainers who are more likely to benefit from it?

Clearly defining the time frame is also important because depending on when you measure the effects, unintended consequences may appear more or less conspicuous. For example, Witte (1992a) noted that unintended effects of fear appeals such as perceived manipulation may go away over the long term. At the same time, some unintended consequences of fear appeals such as desensitization may not be readily apparent in the short term due to their cumulative nature.

Efforts to control unintended effects can occur at each of the phases of a campaign: formative, process, and summative evaluations. In the formative evaluation phase, planners of health communication campaigns may use in-depth interviews, focus groups, and surveys to detect possible unintended effects of messages under development. Planners may also want to pretest a message to diverse types of audience in addition to target audience members because public health messages often have the potential to reach unintended audience. Next, in the process evaluation phase, efforts can be made to monitor whether messages are delivered at intended times to intended audience. Such efforts may help campaigners diagnose and develop plans for summative evaluation. If process evaluation indicated messages were delivered to unintended audience, summative evaluation may ascertain not only intended effects, but also the magnitude of unintended effects.

Further, as Guttman (1997) urged, planners of health communication campaigns should be aware of values (i.e., intervention sponsor's) that may play a role in determining the above suggested criteria.

Limitations

This study has some limitations. First, lab experiment may not have been the best method to examine the key underlying premise of this study, that campaigns take place in real world and therefore may produce unintended effects. Certainly, the results of experimental research differ from those of field studies and hence the former lacks external validity. Exposures to fear appeals were forced, rather than natural, in this study. This experimental design does not allow the examination of the long-term effect of repeated exposures to fear appeals either. However, a study in field setting would make it difficult to determine the causality of unintended effects unambiguously.

Another limitation is the confounds. The high threat message was perceived to be more accurate, clear, of better quality, understandable, and informative. Certainly, greater care and efforts should have been taken for the equivalence of the messages. The purpose of this study dictated that health issue to be examined should be one that is relatively well-known and would involve comparable number of subjects per stage. With a well-known health issue such as skin cancer, balancing the requirements of equivalence and experimental induction was a complex task, however. So the efforts for experimental induction turned out to have compromised their purity. Another look at the messages suggest that the sentences in the high threat message to increase susceptibility may have rendered the high threat message more informative and interesting as well (e.g., "the [sun's] rays can reach down into three feet of water").

In addition, as mentioned earlier, the magnitude of unintended effects were less than that of intended effects. In part, this difference might have come from the fact that

this study was done in Michigan, not in areas such as Arizona in which skin cancer may have far more relevance to its residents.

APPENDICES

Appendix A1

Informed Consent Form

Dear students:

We are currently developing messages to increase college students' knowledge about skin cancer. Our objective is to provide college students with the facts about skin cancer. Specifically, we would like to correct college students' any misunderstanding of skin cancer resulting from misinformation or lack of information.

While examining the message, please underline phrases or sentences that you think are important in each paragraph. After you examined the message, you will be asked to complete a questionnaire on your reactions to the message. Your thorough examination of both the pictures and written components and reactions to them are very important in our project. It will take about 15 minutes to complete the questionnaire. Four weeks later, you will be asked to complete a follow-up questionnaire in classroom.

Your responses to both questionnaires will remain anonymous and will not be associated with you in any manner. However, for us to be able to analyze data, we ask you to create your own code which consists of the following: father's first initial, mother's first initial, your first initial, the month you were born, and the last two digits of your telephone number. Please do not put this code on this page, but on the questionnaire as indicated. This way, we can guarantee your anonymity.

Your participation is voluntary. You may choose not to answer certain questions or discontinue your participation at any time without penalty. We do hope, however, that you will participate in this project because your thoughts and opinions will greatly help us out.

You will receive an extra credit by participating in this project. Moreover, a drawing will be held to provide 10 students with $10 coupons for a local restaurant when you complete the follow-up questionnaire. If you would like to obtain copies of the results or if you have any questions regarding this study, please contact Hyunyi Cho at 432-1310.

Thank you. We greatly appreciate your assistance in this project.

Please indicate if you are willing to participate in this study by signing your name below:

_____(Printed Name)

_____(Signature)

Appendix A2

High Threat Message

Facts about Skin Cancer

Skin cancer is the most common and most rapidly increasing form of cancer in the United States. One in six Americans will develop skin cancer during their life time. Each year, an estimated one million people in this country learn that they have skin cancer. According to current estimates, 40 to 50 percent of Americans who live to age 65 will have skin cancer at least once.

Who is at risk?

You are. You may think that the Michigan sun is not strong enough to cause skin cancer. This is NOT true. According to the Michigan Department of Community Health, the incidence and mortality rates for skin cancer in Michigan have increased markedly, and have far surpassed the percentage increases for total cancer rates. College students may not aware that they have more sun exposure (for example, walking between classes, going to afternoon football games, and outdoor sporting activities) than others. The fact is that getting burned just once can lead to skin cancer, and you can get burned on a cloudy day. You should note that snow reflects the sun's rays. The rays can reach down into three feet of water. American Academy of Dermatology warns that dark brown or black skin is NOT a guarantee against skin cancer. No one is immune to the damaging effects of the sun. Other less important causes of skin cancer include repeated medical and industrial X-ray exposure, scarring from disease or burns, and occupational exposure to such compounds as coal and arsenic.

How does skin cancer affect you?

The sun's damaging effects begin at an early age. While you are out in the sun, changes other than skin color occur beneath the surface of the skin. Your skin becomes dry and leathery. You will soon look much older than you are because of deep wrinkling and sagging of the skin. Moreover, sun exposure damages the blood vessels in the sublayer of you skin. It affects your immune system, therefore decreasing your body's natural ability to fight off infection, cancer, and other diseases. Those who die of skin cancer tend to do so at an earlier age than those who die of other cancers. As a result, skin cancer ranks higher than many more common cancers in terms of average years of life lost per person dying. The cure for skin cancer is often worse than the disease. Treatment includes surgery, freezing, radiation therapy, and chemotherapy. Many times a combination of methods are used, causing a prolonged period of debilitating pain.

A case

Jennifer, a 21-year old student at Michigan State University, discovered a freckle near her eye. Within a week, she developed a small bump underneath what is now a mole. Thinking little of it, it basically went unnoticed. Very soon, the mole became irregularly shaped and somewhat sore. At the advice of her roommate, Jenny finally went to see her doctor. Soon she developed the most serious type of skin cancer, malignant melanoma. Blisters formed, oozed, and crusted over. As they broke again, they let the sappy liquid drain from the open wound. The infected area became larger. As her skin cancer spread, skin rotted off her face, exposing the tender red underlying tissues. The

oozing sores typical of skin cancer gave her excruciating pain. A year later, Jennifer became one of 9,500 patients to die from skin cancer.

Types of skin cancer

There are three kinds of skin cancer that can destroy your skin and permanently damage your internal organs. These are basal cell carcinoma, squamous cell carcinoma, and malignant melanoma.

Basal cell carcinoma is the most common type of skin cancer. It starts as a small, shiny, pearly bump on face, neck, hands, and trunk. Many times it goes unnoticed. Cells from this tumor can be dislodged into the bloodstream and gain a foothold in other organs, such as the lung, liver, and stomach. Otherwise, this cancer will continue to grow at a fairly rapid pace until it damages underlying tissues around the growth. It can extend below the skin to the bone.

Squamous cell carcinoma will start out as red, scaly patches or nodules. This kind of cancer usually shows up and deforms the face and lips. Like basal cell carcinoma, squamous cells can spread to other parts of the body.

Malignant melanoma is the worst of all skin cancers is. It starts near a mole and attacks the color of the skin, hence the name malignant melanoma. Many people die from this type of cancer because it spreads so quickly throughout the body. Melanoma suddenly appears without warning. Survival rates for melanoma go as low as 14%, depending upon the degree that the cancer spreads. It is typically a slow and painful death.

Any UV rays that get to your skin can be detrimental. College-aged persons are not immune to skin cancer. On the contrary, college students are in a VERY HIGH-RISK GROUP for developing skin cancer. Many think skin cancer is easy to treat. This is untrue. If not detected and treated, skin cancer can be deadly.

To reduce the risk of skin cancer:

- Minimize your exposure to the sun at midday.
- Wear hats or clothing that cover your body.
- Perform periodic skin self-examination.
- Apply sunscreen with at least a SPF-15 or higher to all areas of the body exposed to the sun.
- Reapply sunscreen with at least a SPF-15 or higher every two hours and after swimming or perspiring.

Appendix A3

Low Threat Message

Facts about Skin Cancer

With physical fitness being on everyone's mind, outdoor activities are becoming extremely popular. More and more people enjoy physical exercise outside. According to the National Sporting Goods Association, 75.3 million people enjoy jogging, 50.7 million people participate in bicycling, and 46.4 million people take part in swimming, just to name a few. It is important for college students to be concerned about their health. Yet, some of them may be overly worried about skin cancer because they are not well aware of facts about this disease.

Who is at risk?

College-aged persons are rarely affected by skin cancer. According to the U.S. Department of Health and Human Services, the leading causes of death among college-aged persons are accidents and adverse effects, motor vehicle accidents, suicide, and homicide. Skin cancer afflicts older people. There are two main reasons. First, most skin cancer is caused by lifetime exposure to ultraviolet (UV) radiation. Because the development of skin cancer is influenced by UV exposure accumulated over a prolonged period of time, skin cancer most frequently affects persons of age over 50.

Next, the risk of developing skin cancer is affected by where a person lives. For example, in Australia and South Africa, where they have high amount of UV radiation, incidence of skin cancer is high. Similarly, skin cancer incidence in the United States is positively correlated with annual dosages of surface solar UV radiation received at each geographic location. People in areas such as Texas need to be cautious of skin cancer because of the year-round strong sun. You at Michigan State where the sun is so rare belong to a very low-risk group for developing skin cancer. Other less important causes, including repeated exposures to industrial X-ray and such compounds as coal and arsenic, are not relevant to college students either.

How is skin cancer treated?

Skin cancers are easy to detect and most can be cured. Physicians generally are able to spot any skin cancer cells during regular medical exams. In cases of early detection, the cancer is safely treated. Skin cancer accounts for much less than 1 percent of all cancer deaths. It is encouraging to know that skin cancer is now almost 100 percent curable if found early and treated promptly. Doctors can remove skin cancer much like they would remove a wart.

A Case

A 52-year old farmer in New Zealand went to see a doctor because he has developed an unusual mole on his face. It was found to be a form of basal cell carcinoma. Because it was in an incipient stage, the mole was completely removed at the time of the biopsy at the doctor's office. First, a local anesthetic was given to numb the area for a short period of time. Then, the doctor removed the growth and looked at the tissue under a microscope. This is called a biopsy. Because skin cancer rarely spreads, a biopsy often is the only test needed to determine the stage of skin cancer. To make sure that the cancer has not spread to other parts of the body, a special x-ray test was done.

Types of skin cancer

There are three kinds of skin cancer. These are basal cell carcinoma, squamous cell carcinoma, and malignant melanoma. Basal cell and squamous cell carcinomas are sometimes called nonmelanoma skin cancer.

Basal cell carcinoma develops in the layers of cells that form the base of the epidermis, usually on the face, neck, hands, and trunk. It appears as pearly, translucent raised area. Basal cell carcinoma accounts for more than 90 percent of all skin cancers in the United States. However, it is encouraging to know that the cure rate for basal cell carcinoma is greater than 95%, and basal cell carcinoma accounts for less than 0.1% of patient deaths due to cancer.

Squamous cell carcinoma is a red, raised, scaly patch or nodule with well defined outline. It appears on the rim of the ear or the face. Like basal cell carcinoma, the cure rate of squamous cell carcinoma is over 95%. The fatality rate from basal cell and squamous cell carcinomas is less than 1 percent.

Malignant melanoma is a blemish with irregular borders that may turn shades of red, blue, or white. Melanoma has its beginnings in melanocytes, the skin cells which produce the dark protective pigment called melanin. Melanoma consists of melanocytes which have been transformed into cancer cells. Melanoma is much less common than basal cell or squamous cell carcinomas. Doctors have reported a decrease in the number of problems associated with this cell. Melanoma detected early has an excellent chance of being cured.

College students are a very low risk group for developing skin cancer. Skin cancer is prevalent among older people of age over 50. Any doubt you have about any place on your skin can be cleared up by a five minute visit with your doctor. Treatment is quick, easy, and basically painless.

To reduce the risk of skin cancer:

- Minimize your exposure to the sun at midday.
- Wear hats or clothing that cover your body.
- Perform periodic skin self-examination.
- Apply sunscreen with at least a SPF-15 or higher to all areas of the body exposed to the sun.
- Reapply sunscreen with at least a SPF-15 or higher every two hours and after swimming or perspiring.

Appendix B

Measures

_____Father's first initial
_____Mother's first initial
_____Your first initial
_____Month you were born
_____Last two digits of your telephone number

Below is a question about your current lifestyle. Please place a check next to the **ONLY ONE** sentence that best describes your current lifestyle.

Do you use sunscreen consistently (i.e., each time exposed to the sun) when you go out in the sun?

1. No, and I do not intend to start using it consistently within the next 6 months. _____

2. No, but I intend to start using it consistently within the next 6 months. _____

3. No, but I intend to start using it consistently within the next 30 days. _____

4. Yes, I have been using it consistently but for less than 6 months. _____

5. Yes, I have been using it consistently for more than 6 months. _____

_____Father's first initial
_____Mother's first initial
_____Your first initial
_____Month you were born
_____Last two digits of your telephone number

Please answer the following questions with the message you just examined in mind (please circle on a number).

	Not at all						Very much
How much did this message make you feel frightened:	1	2	3	4	5	6	7
How much did this message make you feel tense:	1	2	3	4	5	6	7
How much did this message make you feel nervous:	1	2	3	4	5	6	7
How much did this message make you feel anxious:	1	2	3	4	5	6	7
How much did this message make you feel uncomfortable:	1	2	3	4	5	6	7
How much did this message make you feel nauseous:	1	2	3	4	5	6	7

Please indicate how you feel at this time about each of the following statement by circling a number. 7 means "strongly agree," 4 means "neutral," and 1 means "strongly disagree." Some of the questions may sound similar. However, for us to be able to obtain all aspects of your perceptions, please answer all questions.

	Strongly Disagree			Neutral			Strongly Agree
a. I am at risk for skin cancer.	1	2	3	4	5	6	7
b. It is likely that I will develop skin cancer.	1	2	3	4	5	6	7
c. It is possible that I will develop skin cancer.	1	2	3	4	5	6	7
d. I believe that skin cancer is a severe health problem.	1	2	3	4	5	6	7
e. I believe that skin cancer is a serious threat.	1	2	3	4	5	6	7
f. I believe that skin cancer is a significant disease.	1	2	3	4	5	6	7
c. Reapplying sunscreen with at least SPF-15 or higher every two hours to prevent skin cancer is no problem for me.	1	2	3	4	5	6	7

	Strongly Disagree			Neutral			Strongly Agree
d. I can easily reapply sunscreen with at least SPF-15 or higher every two hours to prevent skin cancer.	1	2	3	4	5	6	7
e. Reapplying sunscreen with at least SPF-15 or higher after swimming or perspiring to prevent skin cancer is no problem for me.	1	2	3	4	5	6	7
f. I can easily reapply sunscreen with at least SPF-15 or higher after swimming or perspiring to prevent skin cancer.	1	2	3	4	5	6	7
g. Wearing clothing that covers my body to prevent skin cancer is no problem for me.	1	2	3	4	5	6	7
h. I can easily wear clothing that covers my body to prevent skin cancer.	1	2	3	4	5	6	7
i. Wearing a hat that provide shade for my face to prevent skin cancer is no problem for me.	1	2	3	4	5	6	7
j. I can easily wear a hat that provide shade for my face to prevent skin cancer.	1	2	3	4	5	6	7
k. Minimizing my exposure to the sun at midday to prevent skin cancer is no problem for me.	1	2	3	4	5	6	7
l. I can easily minimize my exposure to the sun at midday to prevent skin cancer.	1	2	3	4	5	6	7
m. Performing periodic skin self-examination to prevent skin cancer is no problem for me.	1	2	3	4	5	6	7
n. I can easily perform periodic skin self-examination to prevent skin cancer.	1	2	3	4	5	6	7
a. Applying sunscreen with at least SPF-15 or higher to all areas of my body exposed to the sun is effective in preventing skin cancer.	1	2	3	4	5	6	7
b. Reapplying sunscreen with at least SPF-15 or higher every two hours is effective in preventing skin cancer.	1	2	3	4	5	6	7
c. Reapplying sunscreen with at least SPF-15 or higher after swimming or perspiring is effective in preventing skin cancer.	1	2	3	4	5	6	7
d. Wearing clothing that covers the body is effective in preventing skin cancer.	1	2	3	4	5	6	7
e. Wearing a hat that provides shade for my face is effective in preventing skin cancer.	1	2	3	4	5	6	7

	Strongly Disagree			Neutral			Strongly Agree
f. Minimizing my exposure to the sun at midday is effective in preventing skin cancer.	1	2	3	4	5	6	7
g. Performing periodic skin self-examination is effective in preventing skin cancer.	1	2	3	4	5	6	7

1. When I was reading the message and looking at the pictures, my instinct was to:	1 Want to protect myself from skin cancer	2	3	4	5	6	7 Not want to to protect myself from skin cancer
2. When I was reading the message and looking at the pictures, my instinct was to:	1 Want to think about skin cancer	2	3	4	5	6	7 Not want to think about skin cancer
3. When I was reading the message and looking at the pictures, my instinct was to:	1 Want to do something to reduce my chance of developing skin cancer	2	3	4	5	6	7 Not want to do something to reduce my chance of developing skin cancer

Thank you. Below are sets of word pairs. Please place a check next to the word that best describes how you personally feel about each behavior.

1. Minimizing my exposure to the sun at midday during summer is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

2. In general, suntanning is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

	Strongly Disagree			Neutral			Strongly Agree
3. I intend to use sunscreen consistently when exposed to sun within the next 6 months.	1	2	3	4	5	6	7
4. For the next month, each time when I'm exposed to the sun, I intend to use sunscreen.	1	2	3	4	5	6	7
5. When faced with the prospect of developing skin cancer, it helps me to dream of a world where there are no diseases like cancer.	1	2	3	4	5	6	7
6. I intend to buy a sunscreen to prevent skin cancer during the next four weeks.	1	2	3	4	5	6	7
7. Nobody should be telling me when or how I can get sun.	1	2	3	4	5	6	7

	Strongly Disagree			Neutral			Strongly Agree
8. There are so many ways to get cancer today, it's just a matter of time; I might as well just try to accept it.	1	2	3	4	5	6	7
9. This message was misleading.	1	2	3	4	5	6	7
10. In this day and age, it sometimes seems a hopeless task to stay healthy.	1	2	3	4	5	6	7
11. I intend to use sunscreen consistently when exposed to sun within the next 30 days.	1	2	3	4	5	6	7
12. This message was:	1 Overstated	2	3	4 Neutral	5	6	7 Not at all Overstated
13. This message was:	1 Exaggerated	2	3	4 Neutral	5	6	7 Not at all Exaggerated

14. Applying sunscreen with at least SPF-15 or higher when out in the sun is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

15. In general, afternoons out in the sun are:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

16. Applying sunscreen with at least SPF-15 or higher to all areas of the body exposed to the sun is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

17. Reapplying sunscreen with at least SPF-15 or higher every two hours is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

	Strongly Disagree			Neutral			Strongly Agree
18. It's my life. I should be able to get sun if I want to.	1	2	3	4	5	6	7
19. The next time I'm exposed to the sun, I intend to use sunscreen.	1	2	3	4	5	6	7
20. This message was distorted.	1	2	3	4	5	6	7
21. I intend to use sunscreen consistently when exposed to the sun.	1	2	3	4	5	6	7
22. I believe a miracle cure for cancer in the near future is the answer to my fears about skin cancer.	1	2	3	4	5	6	7

23. Reapplying sunscreen with at least SPF-15 or higher after swimming or perspiring is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

24. In general, sunbathing is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

25. Wearing clothing to cover my body when out in the sun is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

	Strongly Disagree			Neutral			Strongly Agree
26. Given what I know about skin cancer, I sometimes feel it's almost useless to try to stay healthy.	1	2	3	4	5	6	7
27. The next time I'm exposed to the sun, I intend to reapply sunscreen with at least SPF 15 or higher after swimming or perspiring to prevent skin cancer.	1	2	3	4	5	6	7
28. This message was:	1 Distorted	2	3	4 Neutral	5	6	7 Not at all Distorted
29. This message was:	1 Overblown	2	3	4 Neutral	5	6	7 Not at all Overblown

30. Wearing a hat to provide shade for my face is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

31. In general, sporting activities out in the sun are:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

	Strongly Disagree			Neutral			Strongly Agree
32. Given what I know about skin cancer, I wish I belonged to another time and another place.	1	2	3	4	5	6	7
33. I intend to minimize my exposure to the sun at middays to prevent skin cancer.	1	2	3	4	5	6	7

34. Going to tanning parlors is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

	Strongly Disagree			Neutral			Strongly Agree
35. I intend to talk to my friends about using sunscreen to prevent skin cancer within the next four weeks.	1	2	3	4	5	6	7
36. This message was exploitative.	1	2	3	4	5	6	7
37. The next time I'm exposed to the sun, I intend to apply sunscreen with at least SPF-15 or higher to prevent skin cancer.	1	2	3	4	5	6	7
38. This message tried to manipulate me.	1	2	3	4	5	6	7
39. The next time I'm exposed to the sun, I intend to apply sunscreen with at least SPF-15 to all areas of my body exposed to the sun to prevent skin cancer.	1	2	3	4	5	6	7
40. I resent being told that I can't get sun.	1	2	3	4	5	6	7
41. The next time I'm exposed to the sun, I intend to reapply sunscreen with at least SPF-15 or higher every two hours to prevent skin cancer.	1	2	3	4	5	6	7
42. If you are destined to die from skin cancer, you will; there is little you can do about it.	1	2	3	4	5	6	7
43. The next time I'm exposed to the sun, I intend to wear clothing that covers my body to prevent skin cancer.	1	2	3	4	5	6	7
44. When I think about the prospect of cancer, I sometimes feel like saying, "What's the use in staying healthy?"	1	2	3	4	5	6	7
45. The next time I'm exposed to the sun, I intend to wear a hat that provide shades for my face to prevent skin cancer.	1	2	3	4	5	6	7
46. Only time will tell if I develop skin cancer; nothing can be done anyway but wait.	1	2	3	4	5	6	7
47. I intend to perform periodic skin self-examination to prevent skin cancer.	1	2	3	4	5	6	7
48. When I think about the prospect of skin cancer, I sometimes feel like eating and drinking too much.	1	2	3	4	5	6	7
49. I intend to use sunscreen each time when exposed to the sun within the next 6 months.	1	2	3	4	5	6	7
50. I intend to use sunscreen consistently when I'm exposed to the sun within the next month.	1	2	3	4	5	6	7

	Strongly Disagree			Neutral			Strongly Agree
51. I intend to buy a sunscreen to prevent skin cancer during the next six months.	1	2	3	4	5	6	7
52. When I sunbathe, I tend to avoid thoughts of skin cancer.	1	2	3	4	5	6	7
53. When I get a sunburn, I tend to avoid thinking about skin cancer.	1	2	3	4	5	6	7
54. When I suntan, I try to not think about skin cancer.	1	2	3	4	5	6	7

55. Using sunscreen when out in the sun to prevent skin cancer is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

56. Performing periodic skin self-examination is:

Good____:____:____:____:____:____:____Bad
Undesirable____:____:____:____:____:____:____Desirable
Favorable____:____:____:____:____:____:____Unfavorable

Please think about the message you read in answering the following questions.

	Strongly Disagree			Neutral			Strongly Agree
1. This message was an accurate description of skin cancer.	1	2	3	4	5	6	7
2. This message was an objective description of skin cancer.	1	2	3	4	5	6	7
3. This message was clearly written.	1	2	3	4	5	6	7
4. I clearly understood this message.	1	2	3	4	5	6	7
5. I learned a lot about skin cancer from this message.	1	2	3	4	5	6	7
6. The quality of arguments in this message was good.	1	2	3	4	5	6	7

Thank you. Here are some questions about your lifestyle.

a. Please place a check next to phrases that best describe your skin type.

1. _____ Always burns; never tans
2. _____ Burns easily; tans minimally
3. _____ Burns moderately; tans gradually to light brown
4. _____ Burns minimally; always tans well to moderately
5. _____ Rarely burns; tans a lot to dark
6. _____ Never burns; deeply pigmented; insensitive

b. Do you know of anyone who has cancer? (Please check all that apply.)

No.___
I do:
1. ___Myself 2. ___Family 3. ___Friend 4. ___Acquaintance 5. ___Neighbor

c. Do you know of anyone who has skin cancer? (Please check all that apply.)

No.___

I do:

1. ___Myself 2. ___Family 3. ___Friend 4. ___Acquaintance 5. ___Neighbor

d. In general, do you work out in the sun?

1. ___Not at all 2. ___Rarely 3. ___Some of the time
4. ___1/2 of the time 5. ___Most of the time

e. How often do you currently use sunscreen?

1. _____Always when exposed to the sun 2. _____Often when exposed to the sun
3. _____Sometimes when exposed to the sun 4. _____Rarely when exposed to the sun
5. _____Never when exposed to the sun

f. Please rate how tan you are now. (Please check only one.)

1. _____Not at all 2. _____A little tan 3. _____Medium tan 4. _____A lot of tan
5. _____Very tan 6. _____N/A (Black skin) 7. _____I don't try to tan

g. What SPF factor do you most often use? (Please circle on a number.)

None 2 4 8 15 25 30

	Strongly Disagree			Neutral			Strongly Agree
a. Most of my family members use sunscreen when out in the sun.	1	2	3	4	5	6	7
b. Most of my friends use sunscreen when out in the sun.	1	2	3	4	5	6	7
a. In general, I use sunscreen when out in the sun more than 2 hours per day.	1	2	3	4	5	6	7
b. In general, I wear a hat to protect against overexposure to the sun.	1	2	3	4	5	6	7
c. In general, I wear protective clothing against overexposure to the sun.	1	2	3	4	5	6	7
d. In general, I minimize my exposure to the sun at middays.	1	2	3	4	5	6	7

e. How often do you go to a tanning parlor?

1. ___Never 2. ___Less than 1 week per year 3. ___Less than 2 weeks per year
4. ___Less than 3 weeks per year 5. ___Less than 1 month per year
6. ___Less than 6 weeks per year 7. ___More than 6 weeks per year

f. How many hours do you spend out in the sun during the summer per week? _____ hours per week

g. How many hours per week do you spend in the sun doing leisure activities? _____ hours per week

h. I have gotten sunburned _____ time(s) during the last 2 years.

i. I have peeled _____ time(s) during the last 2 years.

Please indicate the degree to which you agree or disagree with each of the following statements by circling a number. Please, answer all questions.

	Strongly Disagree			Neutral			Strongly Agree
1. I intend to begin a new job without much advance planning on how I will do it.	1	2	3	4	5	6	7
2. I usually think about what I am going to do before doing it.	1	2	3	4	5	6	7
3. I often do things on impulse.	1	2	3	4	5	6	7
4. I very seldom spend much time on the details of planning ahead.	1	2	3	4	5	6	7
5. I like to have new and exciting experiences and sensation even if they are a little frightening.	1	2	3	4	5	6	7
6. Before I begin a complicated job, I make careful plans.	1	2	3	4	5	6	7
7. I would like to take off on a trip with no preplanned or definite routes or timetable.	1	2	3	4	5	6	7
8. I enjoy getting into new situations where you can't predict how things will turn out.	1	2	3	4	5	6	7
9. I like doing things just for the thrill of it.	1	2	3	4	5	6	7
10. I intend to change interests frequently.	1	2	3	4	5	6	7
11. I sometimes like to do things that are a little frightening.	1	2	3	4	5	6	7
12. I'll try anything once.	1	2	3	4	5	6	7
13. I would like the kind of life where one is on the move and traveling a lot, with lots of changes and excitement.	1	2	3	4	5	6	7
14. I sometimes do 'crazy' things just for fun.	1	2	3	4	5	6	7
15. I like to explore a strange city or section of town by myself, even if it means getting lost.	1	2	3	4	5	6	7
16. I prefer friends who are excitingly unpredictable.	1	2	3	4	5	6	7
17. I often get so carried away by new and exciting things and ideas that I never think of possible complications.	1	2	3	4	5	6	7
18. I am an impulsive person.	1	2	3	4	5	6	7

	Strongly Disagree			Neutral			Strongly Agree
19. I like 'wild' uninhibited parties.	1	2	3	4	5	6	7

Please indicate the degree to which you agree or disagree with each of the following statements by circling a number.

	Strongly Disagree			Neutral			Strongly Agree
1. I become frustrated when I am unable to make free and independent decisions.	1	2	3	4	5	6	7
2. I become angry when my freedom of choice is restricted.	1	2	3	4	5	6	7
3. It irritates me when someone points out things which are obvious to me.	1	2	3	4	5	6	7
4. Regulations trigger a sense of resistance in me.	1	2	3	4	5	6	7
5. I find contradicting others stimulating.	1	2	3	4	5	6	7
6. When something is prohibited, I usually think "that's exactly what I am going to do."	1	2	3	4	5	6	7
7. I resist the attempts of others to influence me.	1	2	3	4	5	6	7
8. It makes me angry when another person is held up as a model for me to follow.	1	2	3	4	5	6	7
9. When someone forces me to do something, I feel like doing the opposite.	1	2	3	4	5	6	7
10. I consider advice from others to be an intrusion.	1	2	3	4	5	6	7
11. Advice and recommendations induce me to do just the opposite.	1	2	3	4	5	6	7

Thank you. Lastly, we'd like to ask a few questions about you to help us classify our data.

a. How old were you on your last birthday? _____

b. What is your gender? 1. _____Male 2. _____Female

c. What best describes your race or ethnic group?
1. ___Caucasian 2. ___African American 3. ___Hispanic 4. ___Asian or Pacific Islander
5. Other (please specify)_____

*Please do NOT talk with any of your classmates about the message until the end of the term.

Thank you very much for your time and cooperation. We greatly appreciate your help.

We are now interested in what you were thinking about while you were reading the message.

You might have had ideas all favorable to the recommendations in the message, all opposed, all irrelevant to the recommendations in the message, or a mixture of the three.

Any case is fine; simply list what it was that you were thinking while reading the message. Simply write down the first idea you had in the first box, the second idea in the second box, and so on.

Please put only one idea or thought in a box.

You should try to record only those ideas that you were thinking during the time you were reading the message.

Please state your thoughts and ideas as concisely as possible...a phrase is sufficient. We have deliberately provided more space than we think most people will need to insure that everyone would have plenty of room to write the ideas they had during the message.

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