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THE ROLE OF SENSATION SEEKING AND LOCUS OF CONTROL IN THE PERCEPTION OF FEAR APPEAL

By

Wen-Ying Liu

A DISSERTATION

Submitted to
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ABSTRACT

SENSATION SEEKING LOCUS OF CONTROL IN TNE PERCEPTION OF FEAR APPEAL

By

Wen-Ying Liu

Although fear appeals have been widely adopted in health communication campaigns to promote behavioral changes, often mixed results emerge in terms of the effectiveness of such appeals. Because trait variables such as sensation seeking and locus of control have been identified as two critical variables influencing how people react to risky behaviors, the present study investigated the relationship between sensation seeking, locus of control and their interactions with fear appeal message outcomes. The preliminary results indicated sensation seeking and locus of control had no direct impact on how individual process a fear appeal message. However, post-hoc analysis suggested a path-analytic model linking sensation seeking and locus of control indirectly to the outcome variables via errors in judgment (individuals' biased beliefs) about their ability to reduce the risk and substitutive behaviors (alternative

risky behaviors). Explanations and recommendations for designing effective persuasive messages are outlined.

To my parents, 劉季平，陳麗娟

ACKNOWLEDGMENTS

My interest in health communication was shaped and refined during my tenure as a graduate student at the communication department. The research team experiences provided me with the opportunity to sample all aspects of health communication, from unrevealing questions to research design and data analysis. Having had the opportunity to receive the best training in the field, I was intrigued by why fear appeals messages, one of the most common strategies in health communication campaigns, sometime backfire. This is why I chose the topic to write my dissertation.

I am deeply indebted to the Dr. Kim Witte, my dissertation advisor and a dear friend, for her generous support, assistance and love without which this dissertation would not have been possible. My gratitude goes to Dr. Phil Gardner, Dr. Mary Bresnahan, and Dr. Jim Dearing, for their patience, support, and ideas throughout my career as a graduate student. Additional recognition is owed to Esther Baker, Marge Barkman, Shelly Campo, Anne Hubbell, Lisa Murray, Rie Ohashi, Brenda Robinson (in alphabetical order), all my professors and student colleagues from the communication department and Collegiate Employment Research Institute for their unconditional encouragement, support, and love. Finally, thanks to my parents and Rudy – for both the tangible and intangible.

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CHAPTER I

The Role of Sensation Seeking in the Perception of Fear Appeals

Risk behaviors such as cigarette smoking, binge drinking, engaging in unprotected sex, or using dirty needles to inject drugs, are commonly observed among different segments of society. Health care professionals and communication scholars have devoted enormous effort and resources to find the most effective methods to persuade people out of such harmful activities. Among various research discoveries, incorporating scare tactics (fear appeals) in messages to motivate people to modify their current behaviors have been found to be relatively effective (Witte & Allen, 1996). However, these 'scary' messages do not always succeed in making people change their habits or stop risky behaviors. What is worse, instead of warning people off the unpleasant results, fear appeals messages sometimes may encourage them to do just the *opposite* to that advocated in the message. This intriguing reversal in turning people to do what they are not expected to do makes us ask if the fear appeal messages are not as 'scary' as we thought.

Many research efforts have tried to answer this paradoxical situation. Current research has shown that risky behaviors have been linked to individuals' sensation seeking trait (Zuckerman, 1994). For example, many researchers (Arnett , 1991; Furnham and Saipe, 1993) have found a significant correlation between sensation seeking and speeding, alcohol and illicit drug use (Barmea, Teichamn, & Rahav, 1992;

Huba, Newcomb, & Bentler, 1981; Newcombs & McGee, 1989; Pederson, 1991; Teichamn, Bamea, & Rahav, 1989; Thombs, Beck, Mahoney, Bromley, & Benzon, 1994). In addition, engaging in risky sexual behavior has also been found to be related to sensation seeking (Zuckerman, Eysenck, Eysenck, 1978) and such research findings appear to suggest that sensation seeking may play a role in shaping individuals' perceptions about the risk involved in their current behaviors. Regardless of the amount of risk involved in the behaviors, do people choose to engage in risky activities because of individual differences in sensation seeking? If the answer is affirmative, then sensation seeking may interfere with the information processing of fear appeals. In other words, high or low sensation seeking may determine whether or not individuals will be persuaded by the fear appeals.

Another individual factor of interest is the locus of control expectancy. Although sensation seeking may be one of the factors which impacts how individuals interpret the threatening portion of the message, what would individuals do after they interpret the messages as threatening and the recommended behavioral modifications as effective? Normally, individuals will take certain protective actions to avert the threats presented in the message. However, this is not always the case given people may feel helpless to take any actions against the risks in life. For example, despite the fact that smoking will lead to serious health problems, Clarke, MacPherson, and Holmes (1982) found that teenagers who have relatively stronger perceptions of external locus of control are more vulnerable to the temptation of smoking than those

with a relatively internal locus of control. Teens with external locus of control believe that the results of their actions depend on luck, change, fate and/or powerful others (Rotter, 1966, Strickland, 1978) rather than on their own abilities. Therefore, they have no need to take further action.

The purpose of the current study is to investigate these two individual factors and their impact on how individuals process fear appeals messages. This line of research may render another possible factor explaining why individuals choose not to follow the recommended behaviors to avoid harm even though they acknowledge the potential threat from the risk behaviors.

In Chapter Two are the proposed explanations as to why individual traits such as sensation seeking and locus of control have an effect on the processing of fear appeals within the framework of the Extended Parallel Process Model, the most recent integration of fear appeal theoretical approaches. Chapter Three explains the methods of the study, chapter Four the results, and chapter Five discusses the findings.

CHAPTER II

SENSATION SEEKING, LOCUS OF CONTROL AND FEAR APPEALS

Overview

The following is a review and analysis of the sensation seeking, locus of control and fear appeal literatures.

Sensation Seeking

Sensation seeking is an individual trait defined by " the need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences" (Zuckerman, 1979a, p. 10). As observed by Zuckerman (1988):

> The high sensation seeker is receptive to novel stimuli: the low tends to reject them, preferring the more familiar and less complex. The high sensation seekers' optimal level of stimulation may depend on the levels set by the characteristics level of arousal produced by novel stimuli. Anything producing lower arousal levels may be considered "boring " (p. 181-182).

Thus, it is not surprising that when exposed to media content, high sensation seekers enjoy novel, vivid and exciting stimulants while low sensation seekers tend to reject such stimulants (Donohew, Pugzles & Palmgreen, 1991). Under other contexts, high sensation seekers enjoy driving at high speeds (Clement & Jonah, 1984; Arnett, 1991), engage in risky sexual behaviors (Horvath & Zuckerman, 1993), or indulge in traveling in a foreign land (Zuckerman, 1979b). High sensation seekers usually do

not feel threatened at all by the hazardous nature of their acts. Instead, they feel gratified by their daredevil moves. In contrast, low sensation seekers will usually view such high risk activities as objectionable and wrong.

Sensation seeking results not only from psychological factors, but from biological factors as well. Apart from the voluntary avoidance of high intensities of stimulation, the low sensation seeker may have a type of nervous system that rejects such stimulation or inhibits cortical reactivity to high intensity stimuli (Zuckerman, 1988, p. 181-182). Psychobiology studies have linked sensation seeking with testosterone, monoamines, their metabolites (especially monoamine oxides), and endorphins (Netter, Henning, & Roed, 1996; Zuckerman, 1979b, 1986, 1996). Bardo and others (Bardo, Donohew, & Harrington, 1996; Bardo & Mueller, 1991; Bardo, Neiswander, & Pierce, 1989; Dellu, Piazza, Mayo, Le Moal, & Simon, 1996) discovered that novelty seeking behaviors have a strong link to self administration of drugs in animals as a function of the common dopamine system in the brain. The biological need for the brain chemicals tends to encourage people to engage in activities that will result in releasing those chemicals (e.g., catecholamines), inducing hedonistic rewards. That is, high sensation seekers could have a larger appetite than non-sensation seekers for outside stimulants. They not only enjoy the behaviors psychologically, but their brains usually react to their behavior and, in turn, release chemical substances that make them experience positive emotions. On the other hand, if they do not receive an appropriate amount of stimulants, they would not feel the

'sensations.' Thus they may not have positive emotions and feelings.

Locus of Control

There are two dimensions of locus of control (Rotter, 1966, Strickland, 1978). The first is internal locus of control, and the second is external locus of control. Rotter (1966) and Strickland (1978) defined locus of control expectancy as a general belief that our behaviors have an impact on our environment and that we are capable of controlling outcomes through our own behaviors. People who believe that they can control the 'outcomes' of various events in life would be labeled as having internal locus of control, whereas those who perceive forces coming from the outside world believe they have no control over their lives and experience an external locus of control. For example, two studies suggest that females with an internal locus of control are more likely to practice birth control more effectively than those with external locus of control (Lundy, 1972). That is, females who had internal locus of control chose to practice birth control because they believed that they had the ability to take responsibilities for their actions (i.e., having sex with no intention to become pregnant). However, those who had external locus of control believed that becoming pregnant was related to their behaviors (i.e., having sex), so that the outcome (i.e., becoming pregnant) was beyond their control and they could not take responsibilities for their actions.

In addition to taking responsibilities for their actions (Davis & Davis, 1972; Phares, Wilson, & Klyver, 1971), individuals who have internal locus of control also

tend to attribute responsibility to agents who activate chance (Hochreich, 1972; Phares & Wilson, 1972; Schiavo, 1973; Sosis, 1974). Hence they appear to be more conceptually alert and attentive (DuCette & Wolk, 1973; Lefcourt, Gronnerud, & McDonald, 1973; Lefcourt & Wine, 1969). In terms of cognitive and motivational aspects of the internal-external dimension, internals have a superior position in exerting power and control over their environment (Phares, 1976). Therefore, we may postulate that locus of control has important impact on individuals decision to take or not take actions against impending dangers.

Locus of control has been linked to specific health-related behaviors such as receiving inoculation for influenza (Dabbs & Kirscht, 1971), wearing seat belt (Williams, 1972a), getting dental check-ups when the teeth and gums have no problems (Williams, 1972b), maintaining a weight reduction program (Kaplan, and Maides, 1976; Wallston, Wallston, 1976), and alcohol abuse (De Brabander and Hellemans, 1996). Based on the research findings, those who have internal locus of control were reported to have a higher inoculation rate against influenza, have greater use of seat belts, go to dentists for check-ups more often, were more satisfied with their weight reduction programs, and drink less alcohol. Thus, one may suggest that, when facing risky conditions (health related or not), individuals who have stronger internal locus of control may exercise more control over the situations so that they are more likely to stay healthy. In other words, compared to those with strong external locus of control, people with stronger internal locus of control tend to avoid risk

whereas those who with strong external locus of control tend to let the risk take them over.

Fear Appeals and Sensation Seeking

Fear appeals usually aim to persuade people to change their current risk behaviors (Bardo & Mueller 1991; Boster & Mongeau, 1994; Covello, von Winterfeldt & Slovic, 1986; Witte, 1992a; Witte & Allen, 1996). However, some populations, such as high sensation seekers seem to be immunized to the persuasive effects of fear appeals. Indeed, at least two studies (Donohew & Witte, 1998; Witte & Morrison, 1994) have shown that fear appeals backfire for high sensation seekers. Witte and Morrison (1994) conducted an experiment using high school students and juvenile delinquents and found that neither high school students nor juvenile delinquents with a high sensation seeking trait were persuaded by the safer sex promotional messages. On the other hand, subjects with low sensation seeking tendencies appeared to be influenced positively by the threatening messages. Why would these threatening messages fail to work for high sensation seekers but work for low sensation seeking teens?

Is it possible that the threatening and risky nature of the behaviors outlined and the use of vivid, graphic and intense language in the fear appeals somehow encourage high sensation seekers to engage in risky behaviors? Could it be the graphic descriptions and the use of vivid languages in the threat messages feeds on the high sensation seekers' need for excitement? The fear appeals may not only remind high

sensation seekers of the existing reward of sensations from the risky behaviors, but also 'suggest' aspects of the risky behaviors that may entail different sensations that they have not known previously. Therefore, for high sensation seekers, fear appeal messages are threatening and the behaviors advocated are risky, but the rewards from practicing the risky behaviors may outweigh the threat. For high sensation seekers, the scary messages seem to provide a perfect supply of thrill and danger to satisfy their appetite.

While high sensation seekers may view fear appeals as exciting and encouraging, low sensation seekers may not enjoy the thrill and threat embedded in the fear appeals; they want to avoid the threat and will not engage in the risk behaviors or ever engage in the behaviors. Given the above-mentioned findings, it is possible to suggest that fear appeals have a different impact on high sensation seekers as compared to low sensation seekers. Thus, one of the purposes of this dissertation is to examine the factors that contribute to the success or failure of fear appeals for high versus low sensation seekers.

However, before examining the nature of how fear appeals affect high /low sensation seekers and people with internal versus external locus of control expectancy, we should examine the underlying mechanism of a persuasive message. The Extended Parallel Process Model (EPPM) provides a framework for understanding persuasive messages with a fear appeal component.

Conflicting Results from Fear Appeal Research.

Inconsistent research results in the fear appeal literature (Leventhal 1970; Sutton, 1982) bring into question the effectiveness of fear appeal campaigns. However, social marketers still choose fear appeals to battle social problems (Tanner, Hunt, & Eppright, 1991). Therefore, reconciling the differences among the results of fear appeal studies and understanding the underlying mechanism of how they work has been a priority of fear appeal researchers. One of the inconsistencies that researchers and practitioners face is that fear appeals do not appear to work all the time and sometimes have only limited effect on behavioral changes. Specifically, most fear appeal theories (e.g., protection motivation theory, extended parallel process model) suggest a relatively high level of fear should induce behavioral changes in line with the direction advocated by the messages, whereas messages with relatively lower levels of fear should fail to direct people to change their behaviors. For example, Feingold and Knapp (1977) found that a relatively high level of threat in the message produced a favorable attitude toward drug use. In contrast, Janis (1967) proposed that the relationship between fear and persuasion could be best represented by an inverted U-shaped curved, indicating that only moderate amount of fear is effective in persuasion. To explain such contradictory findings, researchers tried to include additional variables (e.g., issue relevance, Wheatley, 1971; personality, product usage and socioeconomic economic class, Burnett & Oliver, 1979 etc.) other than the ones that have already been specified in the fear appeal literature (e.g., threat, efficacy, cost etc.). Results from research indicates that fear appeals are not effective unless certain conditions

which promote cognitive appraisal of information regarding efficacious behaviors exists (Janis, 1967; Maddux & Rogers, 1983; Mewborn & Rogers, 1979; Robberson & Rogers, 1988; Roger, 1975; Rogers & Deckner, 1975; Rogers & Mewborn, 1976; Witte, 1992a).

The Extended Parallel Process Model (Witte, 1992a) is the most recent integration of fear appeals theories (Witte, 1992a). It contends that when individuals are exposed to a fear appeal message, they first appraise the threat (i.e., the possible negative consequences of the risky behaviors) and then appraise the efficacy of the recommended responses. Individuals may react to the fear appeals in one of the following three ways. First, if individuals perceive that the risk described in the message is insignificant or irrelevant, they are more likely to remain in their current behaviors and have no intention of avoiding risks in the future because there is not enough threat involved in such behaviors. Second, if individuals perceive that the threat described in the fear appeal is powerful enough to produce fear and they perceive that the recommendation to diminish the risks is efficacious, individuals will exhibit danger control responses (i.e., positive behavioral intentions and attitudes toward the message recommendations). In other words, these individuals are most likely to be persuaded by high threat/high efficacy messages. Third, when individuals perceive that the threat is strong but the recommendations are not so efficacious, individuals are most likely to exhibit fear control responses including defensive avoidance, derogating the information in the fear appeals (issue derogation),

or regarding the messages as manipulative (message manipulation). Instead of engaging in the advocated behaviors to protect themselves from harms, individuals control the fear emotion by denying the dangers. Therefore, no changes would be made to modify current risky behaviors when the perceived threat is high but the perceived efficacy is low.

According to the EPPM, an effective fear appeal should be perceived by the target audiences as highly threatening and highly efficacious. However, what if the target audiences are high sensation seekers who might be encouraged by the appeals? They may seek the thrill and risk rather than avoid it. Fear appeals may fail to warn such people with high sensation tendencies away from risky activities. In addition, if high sensation seekers have a relatively strong external locus of control expectancy, they may believe that because their fates are out of their control, they do not have to change their current behaviors. Previous research on fear appeals and individual difference variables such as sensation seeking and locus of control has been inconclusive. At least two studies have shown that fear appeals do not work for high sensation seekers (Donohew, Witte, 1998; Witte, Morrison, 1995). Other studies have shown that locus of control appears to be unrelated to reactions to fear appeals (Witte, 1991). The purpose of this dissertation is to propose and test an explanation for the conditions under which fear appeals work for high sensation seekers and to further explain the role of locus of control in the processing of fear appeals.

Locus of Control and the EPPM

According to the EPPM, efficacy perception is the moderating mechanism that determines whether individuals choose to adopt the message recommendations or ignore them further. Locus of control expectancy, on the other hand, provides individuals with explanations of what has happened to them as a function of fate, chance and/or powerful others. Thus, when integrated with the concept of locus of control expectancy, perceived efficacy, as outlined in the EPPM, may not be the only factor to determine whether or not the subjects will adopt message recommendations. Individuals' locus of control expectancy may interfere with the processing of the fear appeal messages. That is, locus of control may interact with level of threat in the same manner as efficacy interacts in the EPPM. For example, the EPPM suggests when perceived threat is high, individuals with high efficacy perception are likely to engage in danger control responses whereas individuals with low efficacy perception are likely to engage in fear control responses. Similarly, it is plausible that when exposed to high threat messages, internal locus of control individuals will most likely engage in danger control reactions (because they feel they can control their environment when motivated by the threat to do so) and external locus of control individuals will most likely engage in fear control responses (because they feel the environment controls them and when threatened focus on managing their fear). Therefore, it is possible to suggest that locus of control expectancy may explain why fear appeals sometimes do not work even though both self efficacy and response

efficacy perceptions are strong.

Sensation Seeking and the EPPM

The following sections will now examine how the sensation seeking trait interferes with the appraisal of fear appeals in a persuasive message. As mentioned earlier, Witte and Morrison (1994) propose that, when exposed to fear appeal messages, high sensation seeking teens are reluctant to adopt the recommended safer sex practices in the health campaign messages. In fact, their data seem to suggest that threat messages do not influence behaviors – only sensation seeking tendencies. However, those high sensation seeking teens recognized the existence of threat and were aware of the risk involved in their unsafe practices yet still decided to practice risky behaviors. Such outcomes seem to contradict the ones argued by the EPPM. Other studies also have shown that the interaction between perceived threat and perceived efficacy motivate individuals to engage in either danger control or fear control processes. Viewed in this light, individuals with a high need for sensation tend to tolerate or even seek more threatening messages for attracting and sustaining their attention (Donohew et al., 1988; Olds & Forbes, 1981), so the persuasive messages with highly threatening content may be more likely to encourage high sensation seekers to persist in practicing the risk behaviors. This is probably true because for high sensation seekers, the usual threat by efficacy interaction does not work for them. As high sensation seekers are reported to have strong self-efficacy (Bandura, 1986, Slanger & Rudestam, 1997), they believe they have control over their behavior.

Therefore, when high sensation seekers appraise the efficacy information in the fear appeal, they most likely assume that they have the ability to perform the recommended behaviors, regardless of their true ability. More specifically, when exposed to a fear appeal message, high sensation seekers will not necessarily appraise both threat and efficacy information in the message; rather, they will disregard the efficacy part of the message and appraise only the threat message. In other words, those high sensation seekers may appear to be 'fearless' outside because they think they are in control of the situation at all times. However, the author argues that high sensation seekers are not as 'fearless' as they think. In fact, they may engage in such a deep avoidance, and denial regarding the danger in front of them that it apppears they are fearless. Those high sensation seekers may be deemed as confident and looking for excitement. However, deep inside, they deny the fact that the risky behaviors they engage in are dangerous and they could be so scared that they have to suppress the fear so strongly that they may not be consciously aware of their denial. Therefore, the author predicts the following relationship between sensation seeking and the EPPM:

H1a. A high threat message will produce weaker danger control responses for high sensation seekers as compared to low sensation seekers.

H1b. A high threat message will produce stronger fear control responses for high sensation seekers as compared to low sensation seekers.

In contrast, low sensation seekers do not have a strong desire for sensations resulting from practicing risky behaviors and they may consider the threat involved in

the risky behaviors as extensive. Therefore, low sensation seekers are more likely to be motivated to avoid the risky behaviors and to follow the danger control process suggested by the EPPM. That is, if the perceived efficacy is high, individuals with high threat/high efficacy perception about the messages would try to avoid the dangers brought by the risk behaviors and exhibit danger control responses, because they believe that they can effectively prevent the negative consequences by adopting the recommended behaviors. Therefore, hypothesis 2a and 2b suggest:

H2a. For low sensation seekers with high efficacy perception, a high threat message will produce stronger danger control responses and weaker fear control responses than a low threat message.

H2b. For low sensation seekers with low efficacy perception, a high threat message will produce weaker fear control responses and stronger danger control responses than a low threat message.

In terms of locus of control and the processing of fear appeal messages, as discussed earlier in the chapter, it may be plausible to suggest that when individuals encounter threatening conditions in life, those two forces would influence with each other and influence actions which individuals take to avoid aversive outcomes. For example, a person with a relatively strong internal locus of control will believe that he or she is able to control outcomes in his or her life (Rotter, 1966). As a result, if he or she experiences a health threat, this person will most likely try to take control of the treatment plan and negotiate with the doctor to get the best treatment available to cure

the disease. In contrast, people with an external locus of control believe that their future depends on fate, chance, or powerful others; therefore, they are not likely to engage in active treatment plan management and will probably let the disease progress by itself, thus taking no control of their own future. When locus of control expectancy is integrated into the fear appeal message, chances are that people who possess high self-efficacy perceptions and have an external locus of control will tend not to adopt the recommended behaviors under threatening conditions because external individuals believe they are able to perform recommended behaviors but choose fate or luck to define their responses to health threats. When both threat perception and efficacy perception are high, individuals with an internal locus of control may believe that they have the ability to take actions while individuals with external locus of control may not take any actions because of their beliefs that they do not have the ability to do so. Therefore, the author hypothesizes:

H3a. With a strong threat message, individuals with an internal locus of control will express stronger danger control responses and weaker fear control responses.

H3b. With a low threat message, individuals with an external locus of control will express weaker danger control responses and stronger fear control responses.

CHAPTER III

Method

Overview

The purpose of this study is to test the impacts of the sensation seeking trait and locus of control expectancy on the processing of a fear appeal message. Threat was manipulated at high and low levels in an experimental design. Sensation seeking and locus of control were measured as trait variables with an immediate posttest and two week follow-up. The efficacy component was held constant at a high level across groups[1]. A median split was conducted to separate high/low sensation seekers and external/internal control subjects.

Materials

A railroad crossing safety message[2] was modified into two different versions with an emphasis on either high threat or low threat level. For example, Appendix A shows that the high threat fear appeal messages describes a deadly accident that happened when a college student raced against the train at a railroad crossing. It described the adverse outcome of this accident. The driver was killed when he was hit by the train. Because of the speed of the train, plus the weight, the policeman had a hard time collecting the driver's remains along the railroad track. The use of vivid

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[1] Due to ethical reasons, only high efficacy messages will be included in the study.
[2] The facts regarding highway-rail collisions in the messages are from Federal Railroad

and intense language, which describes exactly what happens when risky behavior results in injury in general, increases perceptions of severity (Covello, von Winterfledt, & Slovic, 1986; Bardo & Mueller, 1991; Witte, 1992a). One black and white photo a illustrating victim who was brutally killed by a severe head trauma was also included to induce fear. In contrast, the low threat message showed that a vehicle-train accident had happened, and the driver was only slightly injured. The accident scene was described in a plain manner in which no vivid language was used such as those that were used in the high threat message and the victim was described as receiving only some flesh wounds from the accident. In addition, one black and white photo with railroad warning signs and gates was included in this message. Both high threat and low threat messages had approximately the same number of statements and were similar in length. Severity and susceptibility were manipulated systematically (see Table 1).

Pilot Study

The fear appeal messages and questionnaires were piloted twice before the administration of the actual study to validate the fear induction of the messages. Subjects were given either a high threat message or a low threat message and then were asked to respond to the content of the messages. A manipulation check in the main study was performed to validate the message manipulation as well. The messages were determined to be appropriate (M_{-} = 2.27 SD = 1.26; M_{-} = 3.61, SD =

Administration Statistics and Operation Lifesaver, Inc.

Table 1: Fear Appeal Message Manipulation

High Threat Message	Low Threat Message
(Severity and Susceptibility) One black and white photo of car accident victim and site. The victim has her head split in half. A statement regarding railroad crossing safety with statistics of fatality and accident rates mentioned.	(Severity and Susceptibility) One black and white photo depicting railroad warning signs and the gates. A statement regarding the railroad crossing safety with no statistics of accidents or fatality rate mentioned.
(Response Efficacy and Self Efficacy) Following railroad safety rules can prevent railroad accidents.	(Response Efficacy and Self Efficacy) Following railroad safety rules can prevent railroad accidents.
(Anecdotal Evidence) A male college student from Michigan was killed in a railroad accident.	(Anecdotal Evidence) A male exchange college student from Japan was slightly injured in a train accident.

1.69, $t = 7.62, p < .01$).

Participants

Two hundred and ninety three undergraduate students were recruited for the study. All of the subjects were undergraduate students who enrolled in regular summer courses at a large Midwest university. Approximately 59% were female, 76.6% were Caucasians, and the average age range was between twenty-one and twenty-two. Subjects were asked to leave their student numbers on the immediate post survey and follow-up survey in order to match survey. To maintain confidentiality of the data, the subjects' student numbers were removed upon the completion of merging the two waves of surveys and a survey ID number was assigned to replace the student number. No subject was individually associated with the study, and human subjects approval was obtained[3].

Measurement

The proposed hypotheses required the measurement of the following variables. Fear, perceived severity, perceived susceptibility, perceived self efficacy, perceived response efficacy, sensation seeking, locus of control tendency, attitude towards the railroad safety messages, and behavioral modification intentions, defensive avoidance, message derogation, perceived manipulation, and error in judgment. Each construct was measured by using 7-point Likert-type scales to assess participants' perception of

[3] To comply with Michigan State University's regulation involving human subjects, human subject approval was obtained before the administration of the surveys

each item, with a higher number indicating greater agreement. The sensation seeking trait was measured by items in multifactor standardized scales. Items representing the same construct were averaged to create an index score. All measures will be briefly described as follows.

Independent Variables

Fear. Fear arousal was measured by having subjects rate the following six mood adjectives: frightened, scared, anxious, worried, nervous, and uncomfortable ("Strongly Disgree" to Strongly Agree"). These items frequently have been used in other fear appeal studies (e.g., Leventhal, Singer & Jones, 1965; Maddux & Rogers, 1983; Rippetoe & Rogers, 1987) and have been found to correspond adequately to psychological arousal (Mewborn & Rogers, 1979). The internal consistency was good (alpha = .93).

Perceived Threat. Perceived threat was assessed by measuring perceived susceptibility and severity. Susceptibility indicates one's subjective perception of the likelihood of involvement in a life-threatening condition, while severity refers to one's feelings concerning the seriousness of involvement in a life-threatening accident (Rogers, 1975) and or its subsequent consequences (Rosenstock, Strecher, & Becker, 1994). Subjects were asked to rate their susceptibility perceptions about getting into a railroad crossing accident with four items (i.e., How possible is it for me to get into a railroad crossing accident?). However, due to the poor internal consistency, the single

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(UCRIHS IRB# 98-468).

item that best represented the construct of perceived susceptibility was used (alpha = .42).

The test for perceived severity had four questions. Subjects were asked about their feelings regarding railroad accidents (i.e., a railroad grade crossing accident leads to severe outcome" " Strongly Disagree" - "Strongly Agree") (alpha = .92).

Perceived Efficacy. The components of efficacy, including self efficacy and response efficacy, were measured with six items each. Self efficacy refers to the confidence in one's ability to perform a recommended behavior (Bandura, 1977) (i.e., "I am able to stop at a railroad crossing when a train is coming" -- "strongly disgree" to "strongly agree,") (alpha = .75). Response efficacy was defined as the effectiveness of the recommended behaviors (i.e., "Stopping at the railroad crossing is effective in preventing collision with the train" "Strongly Disgree" "Strongly Agree") (alpha = .77).

Sensation Seeking. The subjects' sensation seeking trait was measured by nineteen items according to the Impulsive Sensation Seeking Scale (ImpSS) (Zuckerman, Kuhlman, Joireman, Teta & Kraft, 1993). ImpSS is an indicator of general sensation seeking trait without specific type of activities and is considered the "most promising" scale to assess general sensation seeking trait (Zuckerman, 1994, p. 45). ImpSS is a multiscale instrument which consists of five factors: thrill and adventure seeking (TAS), experience seeking (ES), disinhibition (DIS), boredom susceptibility (BS) and impulsivity (Imp). TAS refers to a need to participate in sports

or other physical activities that would arouse strong sensations of speed or gravity, which will be measured by item such as " I would like to do things just for the thrill of it." ES refers to the search for novel sensations and experiences. Subjects were asked to rate statements such as " I like to have new and exciting experiences and sensations even if they are little frightening." Disinhibition describes seeking sensations through social activities like parties, social drinking, and sexual behaviors. Two items asked subjects' attitudes towards social activities such as "I like wild inhibited parties" and "Sometimes I do crazy things just for fun" were included. Boredom susceptibility indicating individuals' tolerance for repetitive experiences was assessed by asking subjects questions such as "I change interests frequently." Impulsivity explains why individuals make decisions without prior planning. Subjects were asked to rate how they respond to the following statement: " I very seldom spend much time on the details of planning ahead." Subjects were be asked to rate each statement from " 1 - Strongly Agree" to " 7 - Strongly Disagree." The internal consistency was good (alpha = .80).

Locus of Control. The measurement of an individual's locus of control expectancy has been generally measured using Levenson and Miller's (1976) Locus of Control Scale (LOCS). Similar to the ImpSS, the LOCS is also a mutifactor instrument consisting of three factors: internality, powerlessness, and chance. Subjects were asked to rate from " Strongly Disagree" to "Strongly Agree" on twenty-four statements such as "I feel like what happens in my life is mostly determined by

powerful others ", "When I get what I want, it's usually because I'm lucky" or "When I make plans, I am almost certain to make them work." The internal consistency was satisfactory (Alpha = .77).

Dependent Variables (Outcome Measurements)

Behavior Intention. Subjects rated their intentions to prevent getting involved in railroad crashes on nine questions, scaled from "Strongly Disagree" to "Strongly Agree." Five items were used to assess one's own intention to accept the recommendations from railroad crossing safety messages (e.g., " I intend to stop at the railroad crossing when the warning signs are flashing and/or the gates are down") (alpha = .94).

Attitude. Attitudes toward practicing railroad safety behaviors were measured by subjects answering nine items (alpha = .94) (e.g., "Stopping at the railroad crossing when the warning signs are flashing and gates are down is "good," "favorable," or "desirable").

Defensive Avoidance. An individual's defense mechanism when encountering unpleasant messages was measured by having subjects rate the following three cognitive descriptions: "When I was first learning about railroad crossing accidents, my first instinct was to avoid thinking about the accident," " When I think about my possibility of being involved in a railroad crossing accident, my first instinct is to avoid thinking about the issue," and "When I first learned about railroad accidents, my first instinct was to ignore what the message said about it" ("Strongly Disagree" -

"Strongly Agree"). The internal consistency was good (alpha = .84).

Message Derogation. Subjects were asked to rate four questions from strongly agree to disagree (e.g.., "Overall, the railroad safety message was boring, overblown, exaggerated or overstated") (alpha = .86).

Perceived Manipulation. Three questions rated from "strongly agree" to "strongly disagree" assessed the reactions from the subjects regarding their responses to the overall notification program (e.g., "The railroad safety message made me feel "angry," "manipulated," or "exploited"). The internal consistency was good (alpha = .88).

Personal Experiences and Demographics

Error in Judgment. Situational factors such, as error in judgment could be a covariate with the perception of threat and efficacy of a fear appeal message. Donohew and Witte (1998) contend that individuals may perceive that they have sufficient time to cross the railroad or they have the ability to 'predict' when the train will come through the tracks, which may provide them with a false sense of security that they are not susceptible to harm from trains. It is possible that individuals' errors in judgment serve as a 'counter-efficacy' message, as opposed to the ones advocated in the railroad safety message, so that individuals have specific cognitive and behavioral skills to act without getting harmed by their risk behaviors. Based on Donohew and Witte's (1998) research, the common errors in judgment are : a) the speed of train, b) the speed of their cars so that they can cross the tracks in time, and c) the distance between the

car and the trains. Therefore, subjects were asked to answer several questions in order to decide their degree of error in judgment regarding railroad safety (alpha = .81).

Substitutive Behavior. During a study of adolescents reckless driving and its relationship to sensation seeking trait, Arnett, Offer, and Fine (1997) concluded that it might be impossible to ask the parents to ride with their adolescent children whenever they drive, or to tailor reckless driving campaigns to fit individual needs. According to their findings, there were may be ways to ".... discharge their sensation seeking and aggressive impulse. If adolescents learn alternative ways to fulfill these needs...." (p. 62-63). If individuals already have had the substitutive behaviors in mind, they may not act on their sensation seeking impulse. In other words, if high sensation seekers have already selected certain activities (e.g., playing the radio loud or singing at the top of their lungs) which can replace the thrills from beating the trains, they might not engage in the dangerous behaviors because they are still receiving enough stimulants to satisfy their needs. Of course, this is not to say that because they choose not to run through the tracks that they are not prone to seeking sensations. Rather, they are a group of individuals who understand the severity of railroad crashes and have discovered some alternative stimulus to satisfy their sensation seeking impulse. Therefore, substitutive behaviors could serve as a covariate impact on the dependent variables.

Six questions addressing subjects' perception of substitutive behaviors were

asked (e.g., "I can think of different things to do while waiting for the train to pass." and "There are fun alternatives to beating the train.") The internal consistency was good (alpha = .87).

CHAPTER IV

RESULTS

Overview

Manipulation checks for the threat construct (i.e., susceptibility, severity) and fear were computed. A median split was used to separate high sensation seekers from low sensation seekers. The internal locus of control and external locus of control were also divided apart by a median split. The Analysis of Variance test (ANOVA) was employed as the primary statistical model to detect the potential interaction effects for all of the hypotheses. Potential covariates such as error in judgment and substitutive behavior were tested with the Analysis of Covariance (ANCOVA). However, no significant effects were found for the possible covariates included in the analysis. All dependent variables (i.e., attitude, intentions, defensive avoidance, message derogation, and perceived manipulation) were used to test how they can be affected by the sensation-seeking trait and the locus of control expectancy[4]. Attempts were made to achieve equal cell sizes, however, to take unequal cell sizes into consideration, the regression approach to the analysis of variance was used, because each cell mean is given equal weight in spite of unequal sample sizes (Tabachnick & Fidell, 1989, p. 340).

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[4] Scores from immediate posttest and two-week follow up surveys were analyzed separately.

Manipulation Checks

Threats. A significant effect due to the threat message was detected on perceived threat using a combined severity and susceptibility measure. Subjects who were exposed to the high threat message believed that railroad accidents were more threatening (M = 5.47, SD = .86) than those who were exposed to the low threat message (M = 5.24, SD = .82) (t = -2.32, df = 290, $p < .01$).

Fear. The messages significantly influenced fear such that subjects in the high threat group were more fearful of the messages (M = 3.61, SD = 1.69) than those in the low threat condition (M = 2.27, SD = 1.26) (t = -7.73, df = 277.90, $p < .01$).

Confound Checks. T-tests showed no difference between subjects receiving high threat messages and those who received low threat messages for accuracy, understanding the materials, or learning about the information in the materials. Although the majority of the subjects were white, race did not emerge as a significant influence on any of the dependent variables. Subjects' sex, age, and previous experiences related to railroad safety (e.g., knowing someone involved in a railroad accident or having personal experience with railroad crossing) also had no significant influence on outcomes.

Hypotheses Testing

> H1a. A high threat message will produce weaker danger control responses for high sensation seekers as compared to low sensation seekers.
>
> H1b. A high threat message will produce stronger fear control responses for high sensation seekers as compared to low sensation seekers.

Hypotheses 1a and 1b were not supported. When exposed to high threat messages, subjects who were categorized as high sensation seekers did not express weaker danger control responses or stronger fear control responses (See Table 2 for complete listing of the results). In fact, an effect which was in the opposite direction of the original hypothesis regarding defensive avoidance reactions occurred. These data suggest that low sensation seekers demonstrated stronger defensive avoidance reaction towards the messages (M = 3.40, SD = 1.31) than did the high sensation seekers (M = 3.80, SD = 1.22)[5].

H2a. For low sensation seekers with high efficacy perception, a high threat message will produce stronger danger control responses and weaker fear control responses than a low threat message.

H2b. For low sensation seekers with low efficacy perception, a high threat message will produce stronger fear control responses and weaker danger control responses than a low threat message.

Hypotheses 2a and 2b were not supported. No significant interaction effect was detected by ANOVA for subjects' danger control responses or fear control responses. More specifically, for low sensation seekers, the combination of a high threat/high efficacy message did not motivate them to modify their current behaviors anymore than the low threat message. However, several main effects were found on attitude,

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[5] With smaller numbers represent stronger defensive avoidance tendency and larger numbers represent less defensive avoidance tendency.

behavioral intention, and message derogation by efficacy perception. It is suggested that, regardless of the level of threat perception, low sensation seekers with stronger perceived efficacy will express more favorable attitudes toward the persuasive message (M = 6.82, SD = .58), stronger intention to modify their current behaviors (M = 6.89, SD = .40) and weaker sense of message derogation (M = 2.31, SD = 1.31) than low efficacy perception individual (M = 6.49, SD = .84; M = 6.36, SD = 1.07; and M = 3.04, SD = 1.40, respectively).

H3a. When threat perception is high, individuals with internal locus of control will express stronger danger control responses than individuals with external locus of control.

H3b. When threat perception is high, individuals with external locus of control will express weaker fear control responses than individuals with external locus of control.

Similar to the findings from the previous hypotheses, Hypotheses 3a and 3b were not supported by the data (See Table 4 for detailed mean scores). That is, locus of control expectancy had no effect on either the subjects' danger control responses or fear control responses. Although the current results were not supported statistically, the pattern of mean scores did indicate a trend which is in line with the predictions from Hypotheses 3a and 3b. Individuals with an internal locus of control demonstrated more positive attitudes, stronger behavioral intention toward the fear appeal message, and the least negative fear control responses toward the messages.

Two-week Follow-up. Only one hundred and ten students[6] who filled out both immediate post survey and the two-week follow-ups and were included in these analyses. No significant main or interaction effect was found for sensation seeking and perceived threat, or for locus of control and perceived threat on attitude or behavioral items.

Alternative Explanations - A Path Analysis Approach

Based on the data from the current study, it suggests that individuals' sensation seeking traits and locus of control expectancy in general have no impact on the processing of the fear appeals message. That is, high sensation seekers might process a highly threatening message no differently than their low sensation seeking counterparts. They would not necessarily consider a highly threatening messages to be more attractive so that they would react to the message differently than the low sensation seekers. In addition, locus of control appears to have no impact on how subjects formed their attitude, behavioral intentions and the perceptions of defensive avoidance or manipulation relating to the message recommendations. However, when analyzing the data using the ANOVA model, and including substitutive behavior and error in judgment as potential covariates in the analysis, some unexpected results emerged. Although almost no statistically significant results were detected among the variables from the hypotheses, a large amount of variance from the ANOVA model

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[6] The two-week follow-up surveys were collected during the final week of the summer semester. Only a very limited number of students were attending classes which led to

was attributed to these two covariates. A similar pattern was found across almost all the dependent variables.

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a low follow-up response rate.

Table 2. Summary table of means and univariate F-test for Hypothesis 1a and 1b Sensation Seeking Trait and Fear Appeal Messages

	HT/LSS (SD)	**HT/HSS (SD)**	***T* value**	***P* value**
Attitude (Time 1)	6.66 (.78)	6.58 (.74)	.65	ns
Behavioral Intention (Time 1)	6.61 (.77)	6.43 (.92)	1.26.	ns
Defensive Avoidance	3.41 (1.72)	3.80 (1.48)	-1.88	< .05
Message Derogation	2.61 (1.51)	2.76 (1.44)	-.62	ns
Perceived Manipulation	2.06 (1.27)	2.07 (1.22)	-.07	ns
Attitude (Time 2)	6.16 (1.58)	6.36 (.84)	-.63	ns
Behavioral Intention (Time 2)	6.00 (1.64)	6.17 (1.00)	-.50	ns
Defensive Avoidance (Time 2)	3.45 (1.19)	4.03 (1.20)	-1.79	< .05

Note: LT: Low threat; HT: High threat; HSS: High Sensation Seekers; HE: Low Sensation Seekers scores for attitudes range from 1 (good/desirable/favorable) to 7 (bad/undesirable/unfavorable). Scores for all other measures range from 1 (strongly agree) to 7 (strongly disagree)." * " Indicates significant differences between two groups

Table 3. Summary table of means and univariate F-test for Hypotheses 2a and 2b Threat Perception, Efficacy Perception and Fear Appeal Messages

	LT/LE (SD)	LT/HE (SD)	HT/LE (SD)	HT/HE (SD)	F-Value	Sig. of F
Attitude (Time 1)	6.27 (1.08)	6.82 (.58)	6.61 (.65)	6.82 (.61)	.33	Ns
Behavioral Intention (Time 1)	6.39 (1.35)	6.83 (.52)	6.33 (.90)	6.96 (.16)	1.55	Ns
Defensive Avoidance	3.81 (1.12)	3.67 (1.17)	3.42 (1.27)	3.50 (1.34)	.30	Ns
Message Derogation	3.09 (1.94)	2.30 (1.10)	3.05 (1.42)	2.31 (1.54)	.00	Ns
Perceived Manipulation	1.49 (.83)	1.36 (.71)	2.12 (1.16)	2.02 (1.43)	.00	Ns
Attitude (Time 2)	5.92 (1.97)	6.88 (.32)	6.14 (1.06)	6.39 (1.80)	.56	Ns
Behavioral Intention (Time 2)	3.83 (1.92)	6.68 (.39)	5.17 (1.51)	6.48 (1.73)	.23	Ns
Defensive Avoidance (Time 2)	4.08 (1.26)	3.31 (1.03)	2.79 (1.38)	3.31 (.93)	3.12	Ns

Note: LT: Low threat; HT: High threat; LE: Low efficacy; HE: High efficacy scores for attitudes range from 1 (good/desirable/favorable) to 7 (bad/undesirable/unfavorable). Scores for all other measures range from 1 (strongly agree) to 7 (strongly disagree).

Table 4. Summary table of means and univariate F-test for Hypotheses 3a and 3b Locus of Control and Fear Appeal Messages

	LT/Intr (SD)	LT/Extr (SD)	HT/Intr (SD)	HT/Extr (SD)	F-Value	Sig. of F
Attitude (Time 1)	6.73 (.64)	6.59 (.82)	6.58 (.82)	6.65 (.70)	1.58	.21
Behavioral Intention (Time 1)	6.64 (.94)	6.47 (1.00)	6.53 (.94)	6.47 (.78)	.25	.62
Defensive Avoidance	3.86 (1.35)	3.85 (1.15)	3.34 (1.17)	3.92 (1.37)	3.42	.07
Message Derogation	2.95 (1.58)	2.97 (1.38)	2.64 (1.58)	2.70 (1.33)	.03	.87
Perceived Manipulation	1.69 (1.10)	1.78 (1.13)	1.98 (1.35)	2.27 (1.29)	.69	.41
Attitude (Time 2)	6.59 (1.20)	6.50 (.75)	6.39 (1.30)	6.22 (.93)	.40	.53
Behavioral Intention (Time 2)	6.33 (1.36)	6.35 (.84)	6.18 (1.35)	5.89 (1.18)	.04	.84
Defensive Avoidance (Time 2)	4.02 (1.58)	4.13 (1.36)	3.59 (1.29)	3.88 (1.20)	.13	.72

Note: LT: Low threat; HT: High threat; Intr: Internal Locus of Control; Extr: External Locus of Control Scores for attitudes range from 1 (good/desirable/favorable) to 7 (bad/undesirable/unfavorable). Scores for all other measures range from 1 (strongly agree) to 7 (strongly disagree).

In other words, covariates such as substitutive behaviors and error in judgment regarding the estimation of the speed of train could account for the most variance in the model. Therefore, substitutive behaviors and error in judgment might have a direct impact on how individuals interpret threatening messages, rather than sensation seeking trait and locus of control expectancy.

In order to test this speculation that substitutive behaviors and error in judgment were also factors influencing how people react to fear appeals messages, a series of regression analyses were performed. Tables 5a and 5b present the results from the regression analyses. The r-squares for all five independent variables (i.e., threat perception, sensation seeking, locus of control, substitutive behaviors and errors in judgement) ranged from .17 to .51 and were all statistically significant, except for defensive avoidance ($R^2 = .17, p > .05$). On the other hand, the regression analyses which included only sensation seeking and locus of control showed no statistically significant r-squares, with an exception of perceived manipulation ($R^2 = .30, \quad p < .05$). Furthermore, the regression analyses indicated that substitutive behaviors and errors in judgement were better predictors of the independent variables than sensation seeking and locus of control[7]. Such results suggest that substitutive behaviors and errors in judgement might serve as two mediating factors between sensation seeking, locus of control, and the outcome variables. In other words, substitutive behaviors and errors

[7] It is important to note that the insignificant beta weights could be cause by additional predictors which are not introduced in the current study. The sole purpose of the post-

in judgment heavily influenced people's attitude, behavioral intentions, and perceptions of defensive avoidance, message derogation and manipulations toward the recommended messages. Thus, it is plausible to suggest that including substitutive behaviors and errors in judgment in addition to sensation seeking and locus of control will enhance the predictive power of the model. Then, the next question would be: how do the two new factors, substitutive behaviors and errors in judgment, interact with the original dependent variables? Will substitutive behaviors only interact with sensation seeking or locus of control alone? Or will error in judgment act as a moderating variable for sensation seeking? To answer these questions, the possible links among these four variables should first be examined.

Links Among Factors

Based on the results of the new regression analyses (see Table 5b for details), without error in judgment and substitutive behaviors added as predictors, the multiple regression coefficients became non-significant for all dependent variables, except for perceived manipulation ($R^2 = .30, p < .01$). Therefore, the data suggest that including error in judgment and substitutive behaviors accounts for more of the variance between the dependent and independent variables. In general, trait variables influence how we perceive the world. That is, sensation seeking and locus of control tendency influence how we judge things (i.e., error in judgment) and behavioral options (i.e., substitutive behaviors.) Correspondingly, how we perceive the world influences

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hoc analysis is to provide an alternative explanation for the results.

outcomes. To formally test the proposed new causal structure of the related variables, a path model was drawn (see Figure 1). This model was tested with path analysis. The correlation matrix used for input in path analysis and the reproduced correlation for each dependent variable are presented in Table 7 to Table 11. The hypothesized models for each dependent variable, with path coefficients, are presented in Figure 2 to Figure 6. The results of the overall Chi-square goodness of fit test (i.e., attitude:13.07, ns; behavioral intention: 8.48, ns ; defensive avoidance: 9.64, ns; message derogation: 8.35, ns; and perceived manipulation: 16.52, $p < .05$) are generally supportive

Figure 1: Proposed Path Model with Path Coefficients: Relationship among the Sensation Seeking Trait, Locus of Control, Error in Judgement, Substitutive Behaviors, Attitude, Behavioral Intention, Defensive Avoidance, Message Derogation, Perceived Manipulation

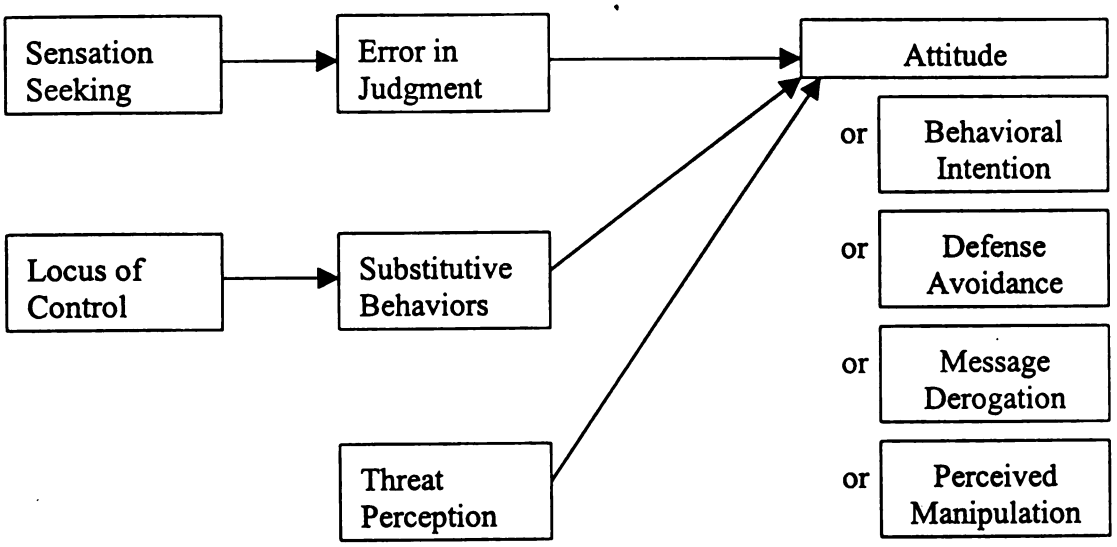

Table 5a: R^2 and Standardized Regression Coefficients (Beta Weight) for Perceived Threat (SCARE) Sensation Seeking Trait (SS), Locus of Control (LOC), Errors in Judgment (ERR)and Substitutive Behaviors (SUB) in Predicting Attitude (ATT), Behavioral Intention(INT), Defensive Avoidance(DEF), Message Derogation(MSG) and Perceived Manipulation(MAN):

	R^2	SCARE	SS	LOC	ERROR	SUB
ATT	.26*	-.06	-.13*	.02	-.17**	.10
INT	.51**	-.05	.03	-.02	-.43**	.20**
DEF	.17	-.08	.02	.11	.08	.02
MSG	.31**	-.07	-.03	-.01	.26**	-.10
MANIP	.40**	.16**	.25**	.09	.19	-.03

* $p < .05$. ** $p < .01$.

Table5b: R^2 and Standardized Regression Coefficients(Beta Weights) for Threat Perception (Scare), Sensation Seeking Trait (SS) and Locus of Control (LOC) in Predicting Attitude(ATT), Behavioral Intention (INT), Defensive Avoidance(DEF), Message Derogation(MSG) and Perceived Manipulation (MAN)

	R^2	SCARE	SS	LOC
ATT	.11	-.03	-.11	.01
INT	.07	-.31	-.00	-.07
DEF	.15	-.09	-.02	.11
MSG	.12	-.10	-.01	.06
MANIP	.30**	.13	.21**	.14**

*p < .05. ** p < .01.

Table 6: Intercorrelations between Measures for Sensation Seeking Trait (SS), Locus of Control (LOC), Error in Judgment(ERR), and Substitutive Behavior (SUB), Attitude(ATT), Behavioral Intention(INT), Defensive Avoidance(DEF), Message Derogation(MSG), Perceived Manipulation(MAN) and Perceived Threat (THR)

	SS	LOC	ERR	SUB	ATT	INT	DEF	MSG	MAN	THR
SS	1.00									
LOC	.25	1.00								
ERR	.13	.09	1.00							
SUB	-.15	-.14	-.19	1.00						
ATT	-.10	-.02	-.22	.13	1.00					
INT	-.22	-.07	-.48	.27	.43	1.00				
DEF	-.02	.11	.09	-.02	-.4	-.02	1.00			
MSG	-.02	.05	.26	-.15	-.26	-.18	.31	1.00		
MAN	.23	.16	.21	-.9	-.16	-.10	.13	.35	1.00	
THR	.04	-.04	-.05	-.6	-.03	-.04	-.10	-.10	.16	1.00

	SS	LOC	ERR	SUB	ATT	INT	DEF	MSG	MAN	THR
SS										
LOC										
ERR	*									
SUB			**							
ATT		*	**	*		**				
INT			**	**						
DEF										
MSG			**	*	*	**	**			
MAN	**	*	**				*	**		
THR									**	

$p < .05$. ** $p < .01$.
N= 293

of the model. With the exception of perceived manipulation, the Chi-square values are small enough to indicate a good fit for the model. According to the path model, sensation seeking and locus of control are the causal antecedents to attitude, behavioral intention, defensive avoidance, message derogation and perceived manipulation. The resulting model reflects an indirect causal impact for these two situational factors on the dependent variables.

To summarize, the proposed model fits the actual data, although small errors in reproduced correlation coefficients were present but within sampling error. As expected, statistically significant path coefficients were found for all five dependent variables for the links between sensation seeking and error in judgment, and for locus of control and substitutive behavior. In addition, the links between error in judgment and the dependent variables were also significant across all conditions. The links between substitutive behavior and the dependent variables do not become significant as expected in all cases. This indicates the potential existence of other intervening variables. The links between threat perception and the dependent variables were weak, compared to other links, which also suggests additional factors may exist between the individual's threat perception and their responses to the fear appeal messages. In all, this model provides some insight into the role of sensation seeking, locus of control, threat perception, error in judgment and alternative behavior in the prediction of attitude, behavioral intentions, defensive avoidance, message derogation and perceived manipulation responses. Specifically, the threat perception does not

act as sensation seeking and locus of control at the same level. In fact, it is plausible to assume that factors other than error in judgment and behavior alternates mediate the relationship between the threat perception and individuals' reactions to fear appeal messages. Another interesting observation from the data is that error in judgment has a strong counter-productive impact on individual's intention to adopt the behavior advocated in the messages (i.e., the more error in judgments, the less behavioral intention to follow the message recommendation) (path coefficient = - .45, $p < .01$) and on attitude change towards the message recommendations (i.e., the more error in judgments, the less favorable attitude) (path coefficient =- .20, $p < .01$). Trait variables, such as sensation seeking, and locus of control, influence how we perceive the world, which ultimately influence outcomes. Sensation seeking is believed to be related to errors in judgment because high sensation seekers often think they are not susceptible to any type of danger and that nothing can easily harm them. Therefore, their judgment of the situations is usually erroneous because they tend to overlook the danger involved in their behaviors and perceive their behaviors are safe. Locus of control, on the other hand, is believed to be related to the awareness of substitutive behaviors because people with internal locus of control believe they have the ability to make changes and therefore create substitutive thrill seeking behaviors to replace the ones involving too much risk.

Figure 2: Path Model 1 with Path Coefficients: Relationship among the Sensation Seeking Trait, Locus of Control, Error in Judgement, Substitutive Behaviors, and Attitude

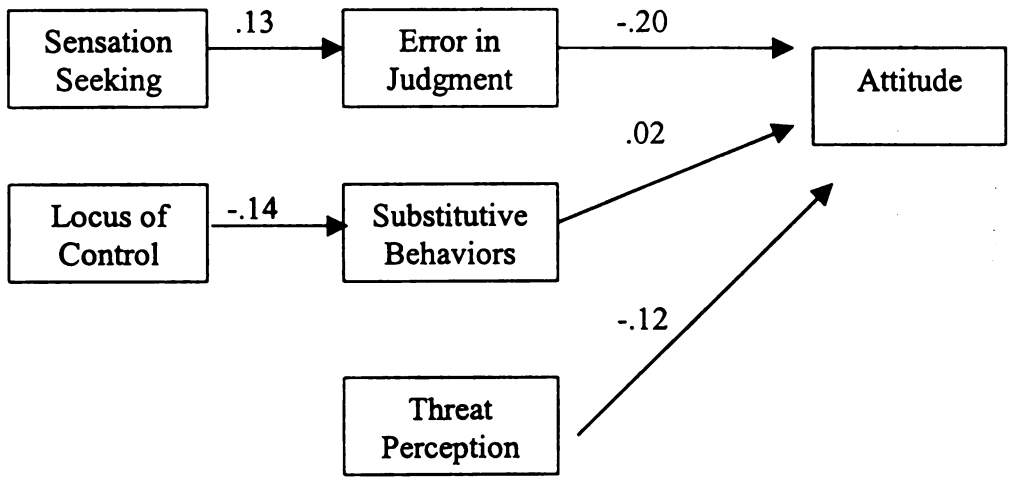

Figure 3: Path Model 2 with Path Coefficients: Relationship among the Sensation Seeking Trait, Locus of Control, Error in Judgement, Substitutive Behaviors, and Behavioral Intention

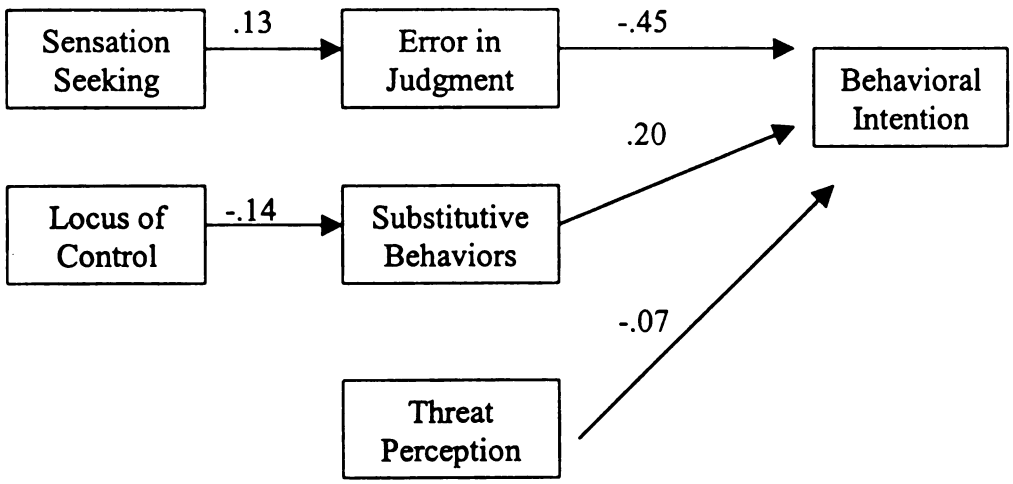

Figure 4: Path Model 3 with Path Coefficients: Relationship among the Sensation Seeking Trait, Locus of Control, Error in Judgement, Substitutive Behaviors, and Defensive Avoidance

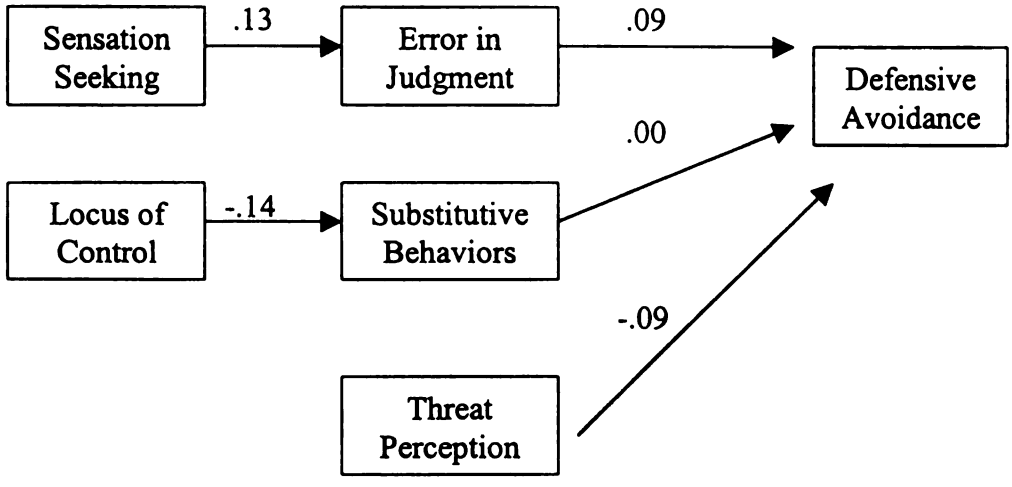

Figure 5: Path Model 4 with Path Coefficients: Relationship among the Sensation Seeking Trait, Locus of Control, Error in Judgement, Substitutive Behaviors, and Message Derogation

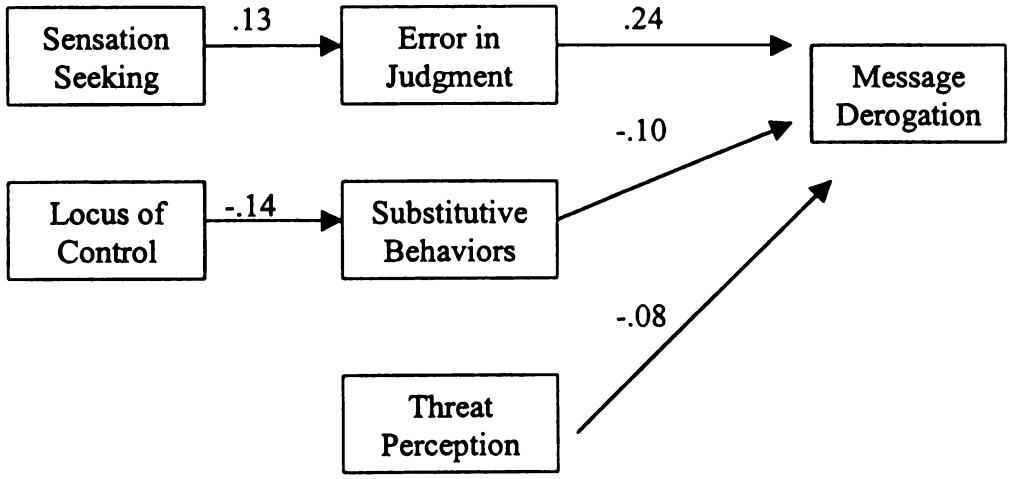

Figure 6: Path Model 5 with Path Coefficients: Relationship among the Sensation Seeking Trait, Locus of Control, Error in Judgement, Substitutive Behaviors, and Perceived Manipulation

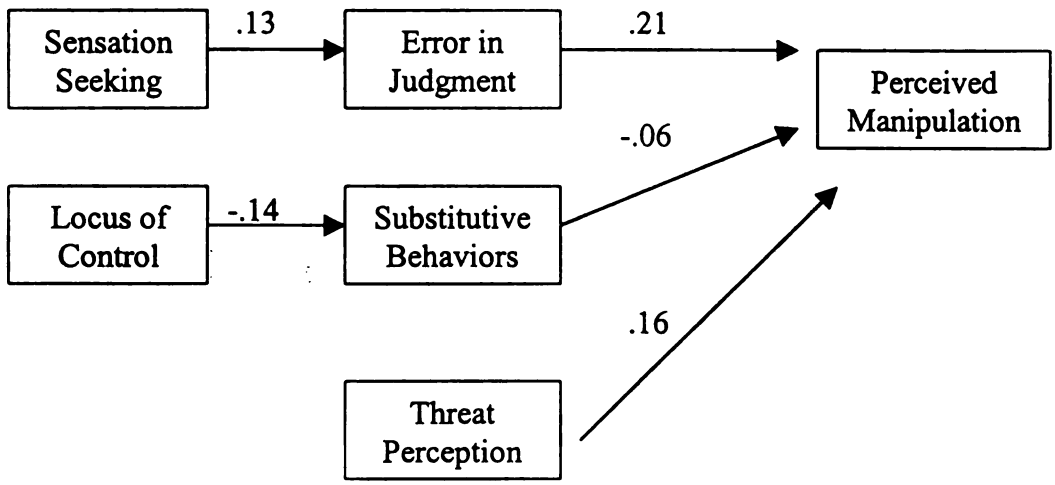

Table 7: Path Model (Attitude)
(1) Average zero-order correlations across six variables

	1	2	10	3	4	6
1	100					
2	24	100				
10	4	-4	100			
3	13	9	-5	100		
4	-15	-14	6	-19	100	
6	9	-15	-11	-20	5	100

(2) Reproduced correlations:

	1	2	10	3	4	6
1	100					
2	24	100				
10	4	-4	100			
3	13	3	1	100		
4	-3	-14	1	0	100	
6	-3	0	-12	20	2	100

(3) Errors: (Actual - reproduced)

	1	2	10	3	4	6
1	0					
2	0	0				
10	0	0	0			
3	0	6	-6	0		
4	-12	0	5	-19	0	
6	2	-15	1	0	3	0

Note :Numbers in the first column and first row represent variable names. Errors are within sampling error.

1:Sensation Seeking Trait
2:Locus of Control Expectancy
3:Error in judgment
4:Substitutive Behaviors
5:Behavioral Intention
6:Attitude
7:Defensive Avoidance
8:Message Derogation
9:Perceived Manipulation
10:Threat Perception

The overall Chi-square is 16.25 (df =7, $t = .07$)

Table 8: for Path Model (Behavioral Intention)

(1) Average zero-order correlations across six variables

	1	2	10	3	4	5
1	100					
2	24	100				
10	4	-4	100			
3	13	9	-5	100		
4	-15	-14	6	-19	100	
5	-2	-7	-3	-48	27	100

(2) Reproduced correlations:

	1	2	10	3	4	5
1	100					
2	24	100				
10	4	-4	100			
3	13	3	1	100		
4	-3	-14	1	0	100	
5	0	-2	-7	-45	20	100

(3) Errors: (Actual - reproduced)

	1	2	10	3	4	5
1	0					
2	0	0				
10	0	0	0			
3	0	6	-6	0		
4	-12	0	5	-19	0	
5	-2	-5	4	3	7	0

Note :Numbers in the first column and first row represent variable names. Errors are within sampling errors.

1:Sensation Seeking Trait
2:Locus of Control Expectancy
3:Error in judgment
4:Substitutive Behaviors
5:Behavioral Intention
6:Attitude
7:Defensive Avoidance
8:Message Derogation

9:Perceived Manipulation
10:Threat Perception

The overall Chi-square is 16.25 (df =7, $t = .21$)

Table 9: for Path Model (Defensive Avoidance)

(1) Average zero-order correlations across six variables

	1	2	10	3	4	7
1	100					
2	24	100				
10	4	-4	100			
3	13	9	-5	100		
4	-15	-14	6	0	100	
7	-2	11	-9	9	0	100

(2) Reproduced correlations

	1	2	10	3	4	6
1	100					
2	24	100				
10	4	-4	100			
3	13	3	1	100		
4	-3	-14	1	0	100	
6	1	1	-9	9	0	100

(3) Errors: (Actual - reproduced)

	1	2	10	3	4	6
1	0					
2	0	0				
10	0	0	0			
3	0	6	-6	0		
4	-12	0	5	-19	0	
6	3	10	0	0	-2	0

Note: Numbers in the first column and first row represent variable names. Errors are within sampling errors.

1:Sensation Seeking Trait
2:Locus of Control Expectancy
3:Error in judgment
4:Substitutive Behaviors
5:Behavioral Intention
6:Attitude
7:Defensive Avoidance
8:Message Derogation
9:Perceived Manipulation

10:Threat Perception
The overall Chi-square is 16.25 (df =7, t = *.21*)

Table 10: Path Model (Message Derogation)

(1) Average zero-order correlations across six variables

	1	2	10	3	4	8
1	100					
2	24	100				
10	4	-4	100			
3	13	9	-5	100		
4	-15	-14	6	-19	100	
8	-1	5	-10	26	-15	100

(2) Reproduced correlations:

	1	2	10	3	4	8
1	100					
2	24	100				
10	4	-4	100			
3	13	3	1	100		
4	-3	-14	1	0	100	
8	3	2	-8	24	-10	100

(3) Errors: (Actual - reproduced)

	1	2	10	3	4	8
1	0					
2	0	0				
10	0	0	0			
3	0	6	-6	0		
4	-12	0	5	-19	0	
8	-4	3	-2	2	-5	0

Note: Numbers in the first column and first row represent variable names. Errors are within sampling errors.

1:Sensation Seeking Trait
2:Locus of Control Expectancy
3:Error in judgment
4:Substitutive Behaviors
5:Behavioral Intention
6:Attitude
7:Defensive Avoidance
8:Message Derogation
9:Perceived Manipulation

10:Threat Perception

The overall Chi-square is 16.25 (df =7, t = *.30*)

Table 11: for Path Model (Perceived Manipulation)

(1) Average zero-order correlations across six variables

	1	2	10	3	4	6
1	100					
2	24	100				
10	4	-4	100			
3	13	9	-5	100		
4	-15	-14	6	-19	100	
6	23	16	15	21	-9	100

(2) Reproduced correlations:

	1	2	10	3	4	6
1	100					
2	24	100				
10	4	-4	100			
3	13	3	1	100		
4	-3	-14	1	0	100	
6	4	1	16	21	-6	100

(3) Errors: (Actual - reproduced)

	1	2	10	3	4	6
1	0					
2	0	0				
10	0	0	0			
3	0	6	-6	0		
4	-12	0	5	-19	0	
6	19	15	1	0	-3	0

Note: Numbers in the first column and first row represent variable names. Errors are within sampling errors.

1:Sensation Seeking Trait
2:Locus of Control Expectancy
3:Error in judgment
4:Substitutive Behaviors
5:Behavioral Intention
6:Attitude
7:Defensive Avoidance
8:Message Derogation

9:Perceived Manipulation
10:Threat Perception

The overall Chi-square is 16.25 (df=7, $t < .05$)

DISCUSSION

Overall Findings

The purpose of this dissertation was to explore the influence trait variables have on individuals' processing of fear appeals. Specifically, this dissertation aims to suggest that two trait variables, sensation seeking and locus of control, would interfere with the information processing as outlined in the EPPM. In other words, high sensation seekers will behave differently toward a scary message than low sensation seekers, because their distinct personal traits will either prohibit or motivate them to process the information illustrated in the EPPM. In like fashion, individuals with an external locus of control expectancy will react differently toward fear messages than their counterparts with an internal locus of control. People with an external locus of control believe outside forces have control over their lives whereas people with an internal locus of control think they themselves have the ultimate power to control their own futures. Based on the EPPM model, their contrary perceptions of the world could also either prohibit or motivate them to process fear appeals.

This dissertation postulated that high sensation seekers would not follow the criteria from the EPPM of weighing the threat and efficacy perceptions toward the fear appeal message. It also maintains that high sensation seekers, because of their need for a larger amount of stimulation, tend to reject the message recommendation, regardless of the high level of threat in a message. On the other hand, low sensation seekers are likely to be convinced by the fear appeal message, because their need for

sensation would not block them from weighing the information presented in the message. In a similar fashion, locus of control expectancy was postulated to influence how individuals view their control life events that may either direct or divert individuals to adopt or reject the persuasive messages.

However, our data do not support the hypothesized association between sensation seeking and variables from the EPPM. Such contradictory findings led to a post-hoc analysis of the data which introduces additional factors which may provide a clearer look at the intriguing relationship between trait factors (i.e., sensation seeking, locus of control), perceptual variables (i.e., error in judgment and alternative behavior) and individuals' responses (i.e., attitude, behavioral intention, defensive avoidance, message derogation, and perceived manipulation) to a fear appeal message. The analysis with two-hundred ninety-three subjects provides another new way to explain why fear appeals sometimes fail.

In terms of specific predictions from the hypotheses, consistent non-significant results emerged. However, an examination of the correlation matrix of the study's variables indicated that sensation seeking and locus of control may have *some* effects on information processing. Regression analysis results revealed that other factors which were first considered as potential covariates appeared to be stronger predictors for most of the reactions toward the fear appeal message than did the trait variables. Therefore, a new hypothesis was formed to postulate a path model that reveals

influence outcomes, as mediated through certain perceptual variables related to railroad safety.

The results from the path analysis indicate that sensation seeking and locus of control have no direct relationships with the participants' attitude, behavioral intention, defensive avoidance, message derogation, and perceived manipulation. Because sensation seeking is indirectly linked to those outcome variables via error in judgment, and because locus of control is directly related to the outcome variables via substitutive behaviors, error in judgment and substitutive behaviors may be better predictors for the fear appeal responses. In fact, based on the size of the path coefficients, error in judgment is overall the best predictor of all the factors. In other words, the data seem to suggest that the pre-existing and biased beliefs relating to a risky behavior have the strongest impact on how individuals process the information and make decisions. Further, these biased beliefs have more predictive power for consequent reactions than the hypothesized variables of threat perception, sensation seeking trait, and locus of control expectancy.

In addition, threat perception seems to have the least explanatory power for the outcome variables, which contradicts the prediction based on the EPPM (Witte, 1992) that threat in combination with efficacy perception carries a direct link to the outcome variables. Since no low efficacy perception was manipulated in the message and the efficacy component of the persuasive message was held at high level across all conditions, the present study is not able to address the combined effect of high efficacy

and threat for the outcome variables. However, the pattern of the path analysis results suggests a potential moderator may exist between threat perception and outcome variables. This pattern deserves further study.

It is interesting to note that for railway safety, a high threat message appears to be no more persuasive than the low threat message (see Table 2 and Table 3 for comparisons between means from outcome variables for high threat message and low threat message). Both messages promoted a strong persuasive response for increased railway safety (i.e., means above 6 on a 7-point scale). As a whole, it is suggested that threatening messages do have an impact on how people appraise the risk from their risky behaviors. According to the data, regardless of the level of threat, these messages induced a relatively high level of positive attitudes regarding railroad safety, and a stronger behavioral intention to avoid railroad accidents, a stronger danger control tendency. Thus, as predicted by the fear appeals literature, threatening messages are in general effective in persuading people into recommended behavioral patterns.

Limitations

The findings that sensation seeking trait and locus of control expectancy, perceived efficacy, perceived threat predict behavior adaptation affords important insights about the design of fear appeal messages. The current study did not, however, consider the interactions among the variables, which may provide means to

explain more of the variance in prevention practices among the target high risk populations. The study was also limited by the relatively small number of subjects with extreme high or low scores either on the sensation seeking scale or locus of control scale. The majority of the subjects were clustered around the midpoint of the scales, resulting in only limited variance between high/low sensation seekers or external/internal locus control expectancy that suggests a restriction in range. Therefore, the limited variation was into further analyses and maybe this resulted in smaller than expected effect sizes. As mentioned in an earlier chapter, the difficulty in recruiting true high/low sensation seekers and internal/external locus of control subjects, and in keeping the subjects from being sensitized by the research topic, makes it difficult study these individual variables. However, one possible way to reduce this flaw would be to recruit subjects who are already engaged in high risk sports such as paragliding, alpine skiing, or piloting small aircraft, or to recruit those who participate in less thrilling activities such as walking or knitting. A better representation of the two unique groups will provide more evidence to support or reject the hypotheses relating to sensation seeking and the EPPM.

A second, more serious limitation, is the potential existence of a ceiling effect. For each of the danger control outcomes, participants scored an average of 6 or above on the 7-point scale. This lack of variability may have prevented true differences from emerging.

Conclusion

The current work suggests that sensation seeking and locus of control alone do not influence the processing of fear appeal messages. Instead, sensation seeking tendencies and locus of control appear to influence the degree to which one perceives that substitutive behaviors and perceptual variables about railway safety (i.e., substitutive behaviors and errors in judgment) influence danger control and fear control responses.

Taken as a whole, it is important to note that, when fear appeals do not work as expected in persuading people to modify their behaviors, it is very possible that trait variables have interfered with individuals' processing of the fear appeal messages. The trait variables may mask the effects of fear appeal messages, diminishing the effects of the fear appeal message. Therefore, understanding the underlying interactions between the trait variables and individuals' processing of a fear appeal message becomes crucial in designing competent fear appeal messages. By understanding the intriguing nature of the two forces interfering with each other, researchers may be able to devise fear appeal messages which can diminish the problem caused by trait variables and maximize the effect.

On the other hand, trait variables may not always mask the effect of the fear appeal messages. It is also possible to suggest that certain trait variables may aid in increasing the power of fear appeal messages. Therefore, studying the effect of trait variables becomes an important task for communication researchers in the future.

Better understanding of the role of trait variables in message processing may help persuasion researchers to explain why fear appeals sometimes backfire.

APPENDICES

APPENDIX A

APPENDIX A

IMMEDIATE POST-TEST SURVEY

Please fill in your student number (PID)_____

Please rate the following statements as:

Strongly Disagree ----------Strongly Agree
1 2 3 4 5 6 7

001___ I can think of different things to do while waiting for the train to pass.
002___ There are fun alternatives to beating the train.
003___ There are exciting things I can do that make it easier for me to wait for the train to pass.
004___ There are other things I can do that make it easier for me to wait for the train to pass.
005___ I can figure out ways to enjoy myself while waiting for the train to pass.
006___ I can still enjoy myself while waiting for the train to pass.
007___ This message makes me feel FRIGHTENED.
008 ___ This message makes me feel SCARED
009 ___ This message makes me feel ANXIOUS.
010 ___ This message makes me feel WORRIED.
011 ___ This message makes me feel NERVOUS.
012 ___ This message makes me feel UNCOMFORTABLE.
013 ___ It is possible for me to collide with a train at railroad crossings.
014 ___It is unlikely that I will collide with a train at railroad crossings.
015 ___It is unlikely that I would be harmed in a vehicle-train collision.
016 ___It is likely that I will be in a railroad accident sometime in my life.
017___ I am susceptible to harm by colliding with a train.
018___ Colliding with a train is harmful.
019___ Colliding with a train leads to a severe accident.
020___ Colliding with a train leads to a serious accident.
021 ___Colliding with a train leads to a significant accident.
022 ___Railroad accidents result in severe injuries.
023 ___Avoiding driving around downed gates can prevent railroad accidents.
024 ___Stopping at the railroad crossings when gates are down and warning lights are flashing can prevent railroad accidents.
025 ___Staying out of safety zones can prevent railroad accidents.
026 ___Avoiding driving around downed gates is effective in preventing railroad

accidents.

027 ___Stopping at the railroad crossings when gates are down and warning lights are flashing is effective in preventing railroad accidents.

028 ___Staying out of safety zones is effective in preventing railroad accidents.

029 ___I am able to avoid driving around downed gates.

030 ___I am able to stop at the railroad crossings when gates are down and warning lights are flashing.

031 ___I am able to stay out of safety zones.

032 ___It is easy to follow railroad safety rules.

033 ___It is easy to stay out of the train safety zone at railroad crossings.

034 ___Even if an oncoming train seems far away, I am able to stop and wait for the train to pass (instead of rushing through the train crossing).

Please tell us your beliefs about railroad safety

035 ___Stopping when flashing lights warn of an oncoming train prevents railroad accidents.

036 ___Staying out of the train zone at train crossings prevents railroad accidents.

037 ___Railway warnings signaling an oncoming train effectively prevent railroad accidents.

038 ___Current railroad safety measures are adequate in preventing train accidents.

039 ___ I am able to avoid railroad accidents.

040 ___When flashing lights warn of an oncoming train, I am content to stop and wait for the train to pass (instead of rushing through the train crossing).

041 ___I am able to beat the train across the tracks if the lights are flashing.

042 ___I am able to beat the train across the tracks if the gate is down.

043 ___If the oncoming train seems far away and the lights are flashing (but the gate is not down), I am able to make it through the train crossing safely.

044 ___If the oncoming train seems far away and the gate is down, I am able to make it through the train crossing safely.

045 ___When I am in a hurry, I try to beat the train across the tracks.

046 ___I can easily judge how fast a train is going.

047 ___I can easily judge how far away a train is.

048 ___I can easily judge whether or not my car will beat the train across the tracks.

049 ___I often cross railroad tracks when a train is coming.

050 ___I am easily able to beat oncoming trains across the tracks.

051 ___It is easy for me to clear railroad tracks before a train crosses them.

Please tell us how you plan to drive through railroad crossings in the future

Strongly Disagree ----------Strongly Agree
1 2 3 4 5 6 7

052 ___I intend to stop when flashing lights warn of an oncoming train.
053 ___I intend to stay out of the train zone at train crossings
054 ___I intend to follow railroad safety rules
055 ___I do not intend to beat the train.
056 ___I am going to stop when flashing lights warn of an oncoming train.
057 ___I am going to stay out of the train zone at train crossings
058 ___I am going to follow railroad safety rules
059___I am not going to intend to beat the train.

Please tell us your reactions to the railroad safety messages you just read

060 ___Stopping and waiting when flashing lights warn of an oncoming train would be good.
061 ___Staying out of the train zone at train crossings would be good.
062 ___Observing railroad warnings signals would be good.
063 ___Stopping and waiting when flashing lights warn of an oncoming train would be favorable.
064 ___Staying out of the train zone at train crossings would be favorable.
065 ___Observing railroad warnings signals would be favorable.
066 ___Stopping and waiting when flashing lights warn of an oncoming train would be desirable.
067___Staying out of the train zone at train crossings would be desirable.
068 ___Observing railroad warnings signals would be desirable.

Please think about the railroad crossing safety messages you just read when you answer the following questions and how you plan to drive through railroad crossings in the future

Strongly Disagree ----------Strongly Agree
1 2 3 4 5 6 7

069 ___I tend to avoid thinking about train crashes.
070 ___I prefer to not think about my car crashing with a train.
071 ___When I first learned about railroad accidents,
my first instinct was to avoid thinking about it.
072 ___When I first learned about railroad accidents,
my first instinct was **not** thinking about it.
073 ___When I first learned about railroad accidents,
my first instinct was to ignore what the message said about it.

074 ___When I think about my possibly been involved in a railroad accident, my first instinct is to avoid thinking about the possibility.
075 ___When I think about my possible been involved in a railroad accident, my first instinct is to ignore the thoughts.
076 ___The railroad safety message was boring.
077 ___The railroad safety message was overblown.
078 ___The railroad safety message was exaggerated.
079 ___The railroad safety message was overstated.
080 ___The railroad safety message made me feel angry.
081 ___The railroad safety message made me feel manipulated.
082 ___The railroad safety message made me feel exploited.
083 ___The railroad safety message deliberately tried to manipulate my feelings.
084 ___The railroad safety message objectively described railroad accidents and related railroad safety message.
085 ___The railroad safety message accurately described railroad accidents and related railroad safety message.
086 ___I understand the information given in the railroad safety message.
087 ___The railroad safety message information was clear.
088 ___I learned something about vehicle-train collisions and railroad safety from the message.
089 ___I feel like what happens in my life is mostly determined by powerful others.
090 ___To a great extent, my life is controlled by accidental happenings.
091 ___Often there is no chance of protecting my personal interests from bad luck happenings.

Please rate the following statements as :

Strongly Disagree ----------Strongly Agree
1 2 3 4 5 6 7

092 ___My life is controlled by powerful others.
093 ___When I get what I want, it's usually because I 'm lucky.
094___People like myself have little chance of protecting our personal interests when they conflict with strong pressure groups.
095 ___If important people were to decide they didn't like me, I probably wouldn't make many friends.
096 ___It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.
097 ___Whether or not I get to be leader depends on whether I'm lucky enough to be in the right place at the right time.
098 ___In order to have my plans work, I make sure that they fit with the desires of people who have power over me.

099 ___It's chiefly a matter of fate whether or not I have a few friends or many friends.
100 ___When I make plans, I am almost certain to make them work..
101 ___I can pretty much determine what will happen in my life.
102 ___When I get what I want, it's usually because I worked hard for it.
103 ___I am usually able to protect my personal interests.
104 ___My life is determined by my own actions.
105 ___Whether or not I get into a car accident depends upon my own ability.
106 ___Although I have good ability, I will not be given leadership responsibility without appealing to those in positions of power.
107___How many friends I have depends on how nice a person I am.
108___I have found that what is going to happen will happen.
109 ___Getting what I want requires pleasing those people above me.
110 ___Whether or not I get into a car accident is mostly a matter of luck.
111___Whether or not I get into a car accident depends mostly on the other driver.
112 ___Whether or not I get to be leader depends mostly on my ability.

Directions: If you agree with a statement or decide that is describes you, answer TRUE. If you disagree with a statement or feel that it is not descriptive of you. answer FALSE. Answer every statement either True or False even if you are not entirely sure of your answer.

113 ___I intend to begin a new job without much advance planning on how I will do it.
114 ___I usually think about what I am going to do before doing it.
115 ___I often do things on impulse.
116 ___I very seldom spend much time on the details of planning ahead.
117 ___I like to have new and exciting experiences and sensation even if they are a little frightening.
118 ___Before I begin a complicated job, I make careful plans.
119 ___I would like to take off on a trip with no preplanned or definite routes or timetable.
120 ___I enjoy getting into new situations where you can't predict how things will turn out.
121 ___I like doing things just for the thrill of it.
122 ___I intend to change interests frequently.
123 ___I sometimes like to do things that are a little frightening.
124 ___I'll try anything once.
125 ___I would like the kind of life where one is on the move and traveling a lot, with lots of changes and excitement.
126 ___I sometimes do 'crazy' things just for fun.
127 ___I like to explore a strange city or section of town by myself, even if it means getting lost.
128 ___I prefer friends who are excitingly unpredictable.
129 ___I often get so carried away by new and exciting things and ideas that I never think of possible complications.

130 ___I am an impulsive person.
131 ___I like 'wild' uninhibited parties.

Please tell us about yourself

132 ___What is your ethnicity? **1) White/Caucasian 2) Black 3) Hispanic 4) Native American 5) Asian 6) Multi-Racial**
133 ___What is your gender? **1) Male 2) Female**
134 ___What is your age? **1) 18 2) 19 3) 20 4) 21 5)22 6) 23 7) 24 8) 25 and above**
135 ___ Do you know anyone who has been involved in vehicle-train collision? **1) Yes 2) No**
If YES, who are they? (please check all that apply:)

136___Stranger	**1) Yes 2) No**
137___Acquaintance	**1) Yes 2) No**
138___Friend	**1) Yes 2) No**
139___Close friend	**1) Yes 2) No**
140___Relative	**1) Yes 2) No**
141___Other	**1) Yes 2) No** , please specify

_____

142 ___Do you drive a car on a daily basis? **1) Yes 2) No**
143 ___How often do you drive through railroad crossings ?
1) Very Often 2) Always 3) Sometimes 4) Seldom 5) Never
144 ___Have you ever been involved in a railroad accident? **1) Yes 2) No**
145 ___Have you ever gone through a railroad crossing when the warning lights were flashing and/or the gates were down?
1) Always 2) Often 3) Sometimes 4) Seldom 5) Never
146 ___If it were legal, would you drive through a railroad crossing when the warning lights are flashing and/or the gates are down just to get a thrill?
1) Always 2) Often 3) Sometimes 4) Seldom 5) Never
147 ___Have you ever being stuck on the tracks before? **1) Yes 2) No**
148 ___Do you know anyone who has been stuck on the tracks before?**1) Yes 2) No**
149 ___Have you ever being involved in moving violations before?**1) Yes 2) No**
150 ___If Yes, How many times? **1) 1-2 2) 3-4 3) 5-6 4) 7-8 5) 9-10 6) 11-12**

APPENDIX B

APPENDIX B

TWO MONTH FOLLOW UP SURVEY

Thank you very much for your time and effort in completing this survey. This is a follow-up survey to the one you completed about two weeks ago. All the questions in this survey are asking for **your opinions and reactions regarding the train safety message you read two weeks ago**. In order to match this questionnaire with the one you completed two weeks ago, **Please fill in your student number (PID)**_____

DID YOU FILL OUT THE FIRST SURVEY ABOUT TWO WEEKS AGO?
YES ____ NO ____

Please rate the following statements as:

Strongly Disagree ——————————————————Strongly Agree
1 2 3 4 5 6 7

001 ___It is possible for me to collide with a train at railroad crossings.
002 ___It is unlikely that I will collide with a train at railroad crossings.
003 ___It is unlikely that I would be harmed in a vehicle-train collision.
004 ___It is likely that I will be in a railroad accident sometime in my life.
005___ I am susceptible to harm by colliding with a train.
006___ Colliding with a train is harmful.
007___ Colliding with a train leads to a severe accident.
008___ Colliding with a train leads to a serious accident.
009 ___Colliding with a train leads to a significant accident.
010 ___Railroad accidents result in severe injuries.
011 ___Avoiding driving around downed gates can prevent railroad accidents.
012 ___Stopping at the railroad crossings when gates are down and warning lights are flashing can prevent railroad accidents.
013 ___Staying out of safety zones can prevent railroad accidents.
014 ___Avoiding driving around downed gates is effective in preventing railroad accidents.
015 ___Stopping at the railroad crossings when gates are down and warning lights are flashing is effective in preventing railroad accidents.
016 ___Staying out of safety zones is effective in preventing railroad accidents.
017 ___I am able to avoid driving around downed gates.
018 ___I am able to stop at the railroad crossings when gates are down and warning lights are flashing.

019 ___I am able to stay out of safety zones.
020 ___It is easy to follow railroad safety rules.
021 ___It is easy to stay out of the train safety zone at railroad crossings.
022 ___Even if an oncoming train seems far away, I am able to stop and wait for the train to pass (instead of rushing through the train crossing).
023 ___Stopping when flashing lights warn of an oncoming train prevents railroad accidents.
024 ___Staying out of the train zone at train crossings prevents railroad accidents.
025 ___Railway warnings signaling an oncoming train effectively prevent railroad accidents.
026 ___Current railroad safety measures are adequate in preventing train accidents.
027 ___ I am able to avoid railroad accidents.
028 ___When flashing lights warn of an oncoming train, I am content to stop and wait for the train to pass (instead of rushing through the train crossing).
029 ___I am able to beat the train across the tracks if the lights are flashing.
030 ___I am able to beat the train across the tracks if the gate is down.
031 ___If the oncoming train seems far away and the lights are flashing (but the gate is not down), I am able to make it through the train crossing safely.
032 ___If the oncoming train seems far away and the gate is down, I am able to make it through the train crossing safely.
033 ___When I am in a hurry, I try to beat the train across the tracks.
034 ___I can easily judge how fast a train is going.
035 ___I can easily judge how far away a train is.
036___I can easily judge whether or not my car will beat the train across the tracks.
037 ___I often cross railroad tracks when a train is coming.
038 ___I am easily able to beat oncoming trains across the tracks.
039 ___It is easy for me to clear railroad tracks before a train crosses them.
040 ___I intend to stop when flashing lights warn of an oncoming train.
041 ___I intend to stay out of the train zone at train crossings
042 ___I intend to follow railroad safety rules
043 ___I do not intend to beat the train.
044 ___I am going to stop when flashing lights warn of an oncoming train.
045 ___I am going to stay out of the train zone at train crossings
046 ___I am going to follow railroad safety rules
047.___I am not going to intend to beat the train.
048 ___Stopping and waiting when flashing lights warn of an oncoming train would be good.
049 ___Staying out of the train zone at train crossings would be good.
050 ___Observing railroad warnings signals would be good.
051 ___Stopping and waiting when flashing lights warn of an oncoming train would be favorable.
052 ___Staying out of the train zone at train crossings would be favorable.

053 ___Observing railroad warnings signals would be favorable.
054 ___Stopping and waiting when flashing lights warn of an oncoming train would be desirable.
055.___Staying out of the train zone at train crossings would be desirable.
056 ___Observing railroad warnings signals would be desirable.
057 ___I tend to avoid thinking about train crashes.
058 ___I prefer to not think about my car crashing with a train.
059 ___When I first learned about railroad accidents,
mv first instinct was to avoid thinking about it.
060___ When I first learned about railroad accidents,
my first instinct was **not** thinking about it.
061 ___When I first learned about railroad accidents,
my first instinct was to ignore what the message said about it.
062 ___When I think about my possibly been involved in a railroad accident,
my first instinct is to avoid thinking about the possibility.
063 ___When I think about my possible been involved in a railroad accident,
my first instinct is to ignore the thoughts.
064 __ Since the first survey, have you ever gone through a railroad crossing when the warning lights were flashing and/or the gates are down? **1) Yes 2) No**
65 __If **Yes**, how often have you gone through a railroad crossing when the warning lights were flashing and/or the gates are down?
1) Always 2) Often 3) Sometimes 4) Seldom 5) Never

APPENDIX C

APPENDIX C

FEAR APPEAL MESSAGE – HIGH THREAT

High Threat Message

According to the U. S. Department of Transportation, vehicle-train crashes are notably different to vehicle-vehicle collisions, as they are 30 times more likely to result in a fatality. In 1997 alone, 488 people were killed and 1,458 seriously injured result from 3,765 highway-rail grade crossing collisions. Unfortunately, every 100 minutes a train will most likely collide with a person or a vehicle in the United States. You have more chance dying by colliding with a train while driving a car rather than dying by flying in an airplane.

In 1997, Michigan had the 6th highest number of death caused by highway-rail grade crossing among 49 states in the United States. The average age range of the people who were either killed or seriously injured in a train-vehicle collision is between 18 to 22 and the most commonly seen reason is to beat the train! There are more than 15 railroad grade crossings existed around MSU's East Lansing campus, which increases its students' chance of getting into a train accident.

What happens when a vehicle collide with a train?

One year ago, Jason, who was a 20-year-old college student from Michigan, died when his car collided with a train. According to the policeman, Jason's car was completely smashed because of the strong impact, and they could hardly tell it was a car.. Worst of all, the police had a tough time collecting Jason's body. They spent over two hours to 'extract' Jason's head, which was almost unidentified and squeezed by the car. Jason's remains were spreading at least 100 feet spreading along the track. There were blood and flesh everywhere. The engineer of the train and a couple of eyewitnesses said Jason did not even intend to stop the car when he saw the train was coming. On the contrary, he stepped on the peddle and tried to go around the downed gates. Unfortunately he had no chance as the result turned out!

The accident not only took Jason's life but also ruined his family's life. His mother had a heart attack when she heard the news. Nicole, Jason's girlfriend, has to see a psychiatrist regularly since Jason's death. They had been together since the high school. She still couldn't accept Jason's death. What's worse, Jason left a 10,0000 bill to pay for damages caused by his unwise behavior.

Look, Listen and Live

Railroad crossing accidents and fatalities can all be prevented. Federal Railroad Administration recommends citizens to simply follow the railroad safety rules such as: Never drive around downed gates and stay in the safety zone of the crossings.

APPENDIX D

APPENDIX D

FEAR APPEAL MESSAGE – LOW THREAT

Low Threat Message

Why Do We Have to Pay Attention to Railroad Safety Message?

According to the U. S. Department of Transportation, many people have lost their lives or injured in traffic accidents. Among different type accidents, vehicle-train crashes are the one usually ignored by the general public. Overall, vehicle-vehicle collisions are different to vehicle-train collisions, as they are less likely to result in a fatality. In addition, people who live the states where railroad crossings are not seem regularly have less problem with railroad safety violation. Based on the statistics in 1997 from Federal Railroad Administration, Texas has the highest number of death caused by vehicle-train collision and Michigan is not among the top five list. People from all age groups are in general susceptible to vehicle-train collisions. However, the chance of being involved in a train-vehicle collision is just slightly higher than being involved in a plane crash, which is not very significant anyway.

When a car collided with a train?

One year ago, Hiro Hashimoto, who was a 21-year-old college student from Tokyo, Japan was injured when his car collided with a train. He was found wounded when the police arrived. According to the Japanese police report, Jason's car was almost destroyed because of the impact from the collision. The front end of the Jason's car hit the train at first, then the his car was 'pushed' along the tracks for about five hundred yards before the train could be stopped.. The engineer of the train and several eyewitnesses all said that Hiro drove across the tracks when the gates were down and the warning signal were flashing. It was a miracle that only the passenger side of the car received most of the impact from the train. Hiro broke his right arms and lots of bruises and had some minor cuts all over his body due to the shattered glasses. He stayed in the hospital for two hours and returned home. There was no sign of other more serious injuries other than broken bones

Hire's families and friends were worried about his condition but were relieved when they learned that he just had some minor injuries. His mother was quite upset because she thought Jason should not have had beaten the train. Yoko, Jason's girlfriend was happy that Hiro was not killed by the train and she kept telling people how lucky Hiro was.

Look, Listen and Live

Railroad crossing accidents and fatalities can all be prevented. Federal Railroad Administration recommends citizens to simply follow the railroad safety rules such as: Never drive around downed gates and stay in the safety zone of the crossings.

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