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# A new perspective on the relation between fear and persuasion : the application of dual-process models.

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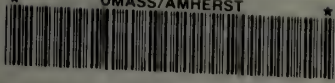
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**FIVE COLLEGE  
DEPOSITORY**

A NEW PERSPECTIVE  
ON THE RELATION BETWEEN FEAR AND PERSUASION:  
THE APPLICATION OF DUAL-PROCESS MODELS

A Dissertation Presented

by

LORI H. ROSENTHAL

Submitted to the Graduate School of the  
University of Massachusetts Amherst in partial fulfillment  
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 1997

Psychology

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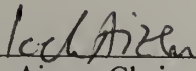
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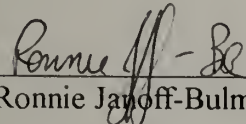
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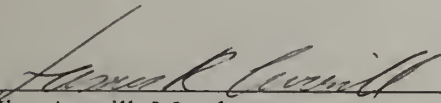
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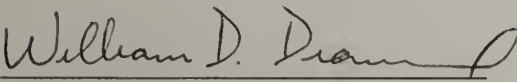
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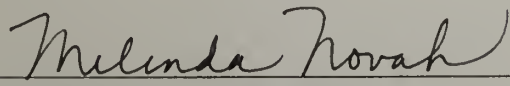
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DEDICATION

*In loving memory of Hilda and Nat Goldstein and Sylvia Resnick*

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I would like to take this opportunity to extend my thanks and appreciation to everyone who helped me in the completion of this project. I am greatly indebted to my committee members, Icek Aizen, Jim Averill, Ronnie Janoff-Bulman, and William Diamond for their suggestions and advice. I would like to specially thank Icek Aizen, my adviser and committee chair for all of the support and guidance he has provided both throughout my graduate school career and for this project specifically. Jim Averill also deserves special recognition for his continual support and advice.

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And now, Mom and Dad, you have only one question left . . .



# ABSTRACT

## A NEW PERSPECTIVE ON THE RELATION BETWEEN FEAR AND PERSUASION: THE APPLICATION OF DUAL-PROCESS MODELS MAY 1997

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Research on the relationship between fear and persuasion led to a proliferation of conflicting results. The purpose of this project was to develop and test hypotheses regarding how fear might impact the persuasion process delineated by the Elaboration Likelihood Model. Fear could direct message recipients into the central or peripheral route by motivating or distracting them from extensive message processing. Fear could also serve as a peripheral cue. It was hypothesized that fear arousal relevant to a persuasive message would motivate subjects to carefully process the message, therefore, central route processing would occur and the amount of persuasion would be based on message quality. It was further hypothesized that fear arousal irrelevant to a persuasive message would distract subjects from attending to the message so that persuasion would occur in the peripheral route and not be based on message quality. Fear arousal was also expected to act as a peripheral cue, enhancing persuasion by its mere presence. A 3 (fear arousal: relevant, irrelevant, none) x 3 (message quality: strong, weak, minimal) x 2 (topic: heart disease, peptic ulcers) design was used. A secondary goal of this study was to develop a methodology to arouse fear separate from a persuasive message to avoid the



confounding variable problem present in other fear appeal research. This was successfully accomplished. As predicted, there was a marginally significant effect demonstrating that relevant fear resulted in a greater disparity between strong and weak messages than no fear arousal for one of the topics. Contrary to predictions, irrelevant fear arousal did not result in smaller differences in persuasion when compared with no fear arousal. There was a marginally significant effect that relevant fear arousal produced greater intentions than no fear arousal in the minimal message condition for one of the topics. The results provided partial support for the hypotheses that fear can motivate extensive message processing and can serve as a peripheral cue. There was no evidence that irrelevant fear distracted from extensive processing. Implications of these results and possibilities for future research are discussed.

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## CHAPTER 1

### REVIEW OF LITERATURE AND HYPOTHESES

Fear-based persuasive appeals abound in public health messages, political campaigns, advertising copy, and other areas of persuasion. People are induced to adopt a particular course of action or to purchase a specific product by arousing fear of the consequences of not performing certain behaviors or not purchasing a product. Yet, in spite of the proliferation of fear appeals, psychological research and theorizing on the relation between fear and persuasion has been inconsistent and inconclusive.

Some of the research conducted on the relation between fear and persuasion has shown that arousing fear increases persuasion. For example, increasing fear in a message about the importance of seat belt use was successful in changing attitudes toward seat belt use (Berkowitz & Cottingham, 1960). A high fear message was also more successful than a low fear message in changing intentions to quit smoking (Rogers & Thistlethwaite, 1970). Other studies have shown the opposite relationship between fear and persuasion; that arousing fear decreases persuasion. The best-known example of research on fear appeals demonstrated that a high fear message regarding dental hygiene was *least* successful in changing attitudes and tooth-brushing behavior compared to both a moderate fear and low fear message (Janis & Feshbach, 1953). Still other research has shown either no effect of fear on persuasion (Moltz & Thistlethwaite, 1955; Maddux & Rogers, 1983; Dembroski, et. al. 1978) or mixed effects where fear increases persuasion on one measure but has different effects on other measures. Increasing fear in an anti-smoking message induced more compliance with the message's recommendations to decrease consumption of cigarettes but reduced compliance with the recommendation to get a chest x-ray (Leventhal & Watts,



1966). Similarly, a high fear message increased intentions and behavior change on some dependent measures in another study, but not on others in another version of the dental hygiene experiment. Specifically, subjects who received a high fear message reported spending more minutes per day flossing their teeth than subjects who received a low fear message. However, there were no differences between the low and high fear groups on the number of times per week they flossed and there were no differences on tooth brushing behavior (Beck & Lund, 1981).

There are several possible reasons for the inconclusive findings documenting the effects of fear on persuasion. The present research will focus on three of these issues. The first is that theories attempting to explain and predict the effects of fear on persuasion have posited conflicting predictions. For example, the original conceptualization of the Fear-Drive Model (Hovland, Janis, & Kelly, 1953) theorizes that increases in fear will correspond with increases in persuasion while Janis's extension of the Drive Model (Janis, 1967) assumes that there is a curvilinear relationship between fear and persuasion. The second issue is that research results may be inconsistent due to methodological problems. One such problem that has occurred in the fear appeal literature is that fear is often confounded with other variables. A third issue in the fear appeal literature that may account for the existing discrepancies in the research results is that researchers have failed to agree on what exactly constitutes a fear appeal. As such, fear has been operationalized in many different ways including false physiological feedback, personal vulnerability, and noxious consequences. Each of these will be discussed in more detail below.

## Analysis of Theoretical Positions

One purpose of this dissertation is to review past theory and research on the fear-persuasion relationship and to understand, in light of current theories of persuasion, the processes by which fear arousal has an impact on attitude and behavior change as well as the circumstances under which this impact occurs. In the sections of this paper that follow, I will discuss the characteristics of the various theoretical approaches to the question of the relationship between fear and persuasion, will clarify some of the supporting evidence for each of the existing theories, and will examine some empirical research evidence. Finally, I will present a more comprehensive theoretical position integrating the existing fear appeal literature with current dual-process models of the persuasion process, discussing the fit with previous research and the implications for the current experimental project.

### Review of Theories

Fear-Drive Model. The earliest conception of the effects of a frightening persuasive message on attitude and behavior change was the Fear-Drive Model elucidated by Hovland, Janis, and Kelly (1953) and later elaborated on by Janis (Janis & Feshbach, 1953; Janis, 1967). According to this model, any disturbing emotion, such as fear, has the functional property of a drive. When individuals experience fear, they become motivated to try a variety of behavioral responses until the unpleasant experience of fear is alleviated. As this model is based on the principles of learning theory, it states that the behavioral responses that are attempted in order to reduce fear

are determined by past learning experiences in which similar fear states were successfully reduced.

In the context of persuasion, the theory assumed that people receiving a frightening persuasive message would find that accepting the behavior advocated by the message would reduce the unpleasant state of fear. The theory further assumed that message recipients will be most likely to accept the message recommendations under two specific conditions. The first condition is that the level of fear experienced by the person is sufficiently intense to constitute a drive state. The second condition is that the rehearsal of the recommended attitude or behavior results in an immediate reduction in the amount of fear experienced. In effect, the amount of persuasion that occurs in response to a threatening message is the result of the arousal of fear to such an extent as to constitute a drive state and the subsequent reduction in fear arousal that accompanies the rehearsal or learning of the recommendations for avoiding the threatening consequences depicted in the persuasive message.

In the event that the threat in the persuasive message does not arouse enough fear to constitute a drive state, persuasion will not occur according to the principles elucidated above. Similarly, if the level of fear arousal is not sufficiently reduced or eliminated by rehearsal of the message recommendations, the amount of persuasion that occurs will be minimized. The lack of sufficient fear reduction that results in decreased persuasion could occur as the result of the perceived ineffectiveness of the message recommendations, the irrelevance of the recommendations to the threatening event, or the difficulty in actually carrying out the recommendations. In the situation where the subject's learning of the message recommendations does not sufficiently reduce the experience of fear, other behavioral responses will be attempted until the unpleasant state is successfully eliminated. For example, message recipients may distort the

meaning of the persuasive message or engage in overt escape activities such as failing to pay attention to the contents of the message, or rejecting the message due to aggressive feelings toward the source of the message. These behaviors have been termed *defensive avoidance*.

The fear-drive model, therefore, predicts an inverted U-shaped relationship. Both high and low levels of fear arousal will not lead to changes in attitudes or behaviors in the direction advocated by the message. Under low fear arousal, the amount of fear would not be sufficiently intense to constitute a drive state and would therefore not motivate acceptance of the message. High fear, on the other hand, may inhibit message acceptance if learning the message recommendations does not alleviate the fear. This could be due to an incomplete reduction of fear after learning the message content or defensive avoidance as the message recipient attempts to ward off exposure to the threatening content of the message.

Janis and Feshbach's (1953) dental hygiene experiment is most often cited as evidence in support of the Fear-Drive Model. In this study, levels of fear arousal were manipulated by using three messages of varying threat intensities low, moderate, and high levels of threat. Ratings of the amount of fear aroused by these messages indicated that people who received low levels of threatening information experienced the least amount of fear arousal while those who received high levels of threatening information experienced the greatest amount of fear arousal with moderate threatening information falling between the two extremes. All message recipients received specific recommendations as to how to avoid the danger described in the threatening information. Following these persuasive appeals, the message recipients indicated their beliefs, attitudes, and intended behavior regarding the message recommendations. Immediately after the fear-arousing message, subjects exposed to the high fear version



reported being more worried about the condition of their teeth, and more interested in the contents of the message. However, when attitude and behavior changes were assessed a week later, persuasion was the greatest following the low threat message and least following the high threat message. This study was interpreted as providing evidence for defensive processing; the behavioral recommendations provided by the message were presumably perceived as ineffective against the extreme danger portrayed in the highly threatening message.

Another research area that provided support for the fear-drive model involved the manipulation of fear through false physiological feedback (Harris & Jellison, 1971). Fear was manipulated by having subjects attached to electrodes view a monitor that purportedly registered their level of anxiety while they watched a moderately arousing persuasive film. Physiological feedback indicated that subjects were either not anxious during the film or were highly anxious during a fear arousal portion of the message. Anxious subjects were then given feedback that their arousal levels either decreased or remained high during a message recommendation portion of the film. Subjects reported greater message acceptance when high arousal during a frightening message dropped on receiving recommendations to avoid the frightening event than when their high arousal did not lessen. This provided support for the notion that persuasion will occur when the message recommendations are sufficient to alleviate fear arousal.

Janis (1967) extended the earlier versions of the fear-drive model in an attempt to take into account the mixed experimental findings regarding the impact of fear on persuasion. He proposed a three-dimensional representation of the fear-drive model that attempted to take into account any interactions between level of fear arousal and possible other variables that might affect a message recipients' appraisal of the recommended action proposed in the persuasive message. In essence, he proposed that

any persuasive message would have, associated with it, an optimal level of fear arousal where persuasion will be the greatest. The actual value of that optimal level of fear arousal would vary depending on the topic, the situation, and any other relevant variables. In effect, then, the number of inverted-U shaped curves relating level of fear to persuasion is infinite because each curve is generated by a variety of factors that interact with fear. Janis represents this model in a three dimensional space with fear on the X-axis, acceptance of the message recommendations on the Y-axis, and a composite of possible interacting variables on the Z-axis. However, this theory is so complex and contains so many unspecified variables that it is difficult to apply this model to the literature on fear appeals in order to effectively evaluate it as an extension of the fear-drive models. Since it contains the same underlying assumption that fear functions as a drive to motivate persuasion, it is usually considered in the same manner as the earlier description of the fear-drive model.

Parallel Response Model. Leventhal (1970) rejected the assumption inherent in the fear-drive model that the emotional response of fear is the driving force behind attitude and behavior changes as a result of exposure to a threatening persuasive message. Instead, he proposed that a person's response to a threat appeal depends on that person's cognitive as well as emotional reactions to the message. Leventhal draws a distinction between a person's emotional reactions to threatening information and a person's cognitive evaluation of the danger the threat poses and how to control that potential threat. The emotional arousal of fear does not necessarily cause the cognitive attitude or behavioral changes; fear arousal does not even have to occur prior to the cognitive response as it does in the fear-drive model. Instead, Leventhal proposed that

these two responses, emotional and cognitive, can occur simultaneously. In effect, they are separate but "parallel" responses to a threatening persuasive message.

Leventhal (1970) further postulated that information corresponding to a person's cognitive appraisal that they are in danger for a particular threat activates a coping process he called *danger control*. Danger control is thought to be a problem-solving process in which the listener examines the environment for information relevant to dealing with the threat presented in the persuasive message. When a danger control process is activated, the focus of attention for the message recipient is the potential danger that the threat poses. This process produces coping responses that are focused on reducing or avoiding the threat such as paying attention to and adopting the recommendations contained in the persuasive message. A parallel coping response that Leventhal called *fear control* is activated by information pertaining to a person's emotional response. Specifically, fear control is the coping mechanism used when a person's emotional state of fear in response to threatening information provides the cues for determining action. When fear control is activated, the message recipient strives to reduce the amount of fear experienced. The process produces coping responses that are focused on internal emotional responses, not on dealing with the external threat potential. As a result, the process of fear control may produce actions that have little or no effect on the actual danger a person faces such as avoidant reactions.

Leventhal asserted that fear control and danger control may be independent processes but that they may also interact with each other. For the most part, a threatening persuasive message will have similar effects on both fear and danger control such that a highly threatening message will increase levels of fear experienced and increase motivation to engage in danger control processes such as changing attitudes



toward protective actions, increasing intentions to perform protective actions, and a higher likelihood that protective actions will be taken. However, it is also possible that after exposure to highly threatening information, fear control processes might be very strong and might lead to avoidance behaviors that would disrupt the danger control process and would lead to resistance to the recommendations advocated in the persuasive message.

The parallel response explanation has also been used to predict an inverted - U shaped relationship between the level of fear arousal and the corresponding attitude or behavior change inspired by the persuasive message (Sternthal & Craig, 1974). As fear increases, both danger control and fear control coping processes increase. When fear arousal is at a moderate level, danger control process is activated at a relatively strong level while the fear control process is relatively weak. As a result, message recipients attempt to reduce the threat or danger they face by accepting the recommendations in the persuasive message. When fear arousal is low, both danger control and fear control processes are not activated; message recipients will not accept the recommendations in the persuasive message because there is no reason to do so, they are not in danger for the threatened health problem. At high levels of fear arousal, danger control processes remain high but fear control processes also increase to high levels. The high level of fear control as a coping mechanism results in behavior that will interfere with the danger control process of accepting the message recommendations for protection from the threatened health problem. As a result, message recipients again fail to accept the recommendations in the persuasive message.

Partial support for Leventhal's (1970) conception of two parallel processes of danger control and fear control can be found in a research study examining the effects of a persuasive message about the dangers of smoking on two related behavioral

measures, getting a lung X-ray and attempting to quit smoking. In this study (Leventhal & Watts, 1966) visitors to a health exposition were shown a version of a film concerning the link between cigarette smoking and lung cancer. Film versions varied in terms of the fear they aroused. The low fear version used unemotional charts and diagrams to establish the link between smoking and lung cancer while the moderate and high fear versions combined the statistical information from the low fear message with the story of a man who discovers he has lung cancer after getting an X ray. The high fear message also contained a segment of the actual lung removal operation. After seeing one of the three versions of the film, all viewers were urged to get a free chest X-ray (conveniently located down the hall) and were told to give up smoking. The results of the study indicated that the high fear message was more successful than both the low and moderate fear messages in getting people to successfully reduce the number of cigarettes they smoked per day over the 6 month period following the movie. However, the opposite pattern of results occurred for the X-ray behavior: the high fear message was less successful than the low and moderate fear messages for getting people to get a chest X-ray. Although the fear messages in this study confounded information related to the fear control and danger control processes later posited by Leventhal (1970), this study does provide some partial support for the idea. The behavior of quitting smoking represents a successful use of the danger control process. Smoking was shown to cause lung cancer, so if one is at risk for lung cancer an effective way to reduce one's potential for danger is to quit smoking. However, getting an X-ray does not reduce one's potential danger for getting lung cancer. Based on correlational analyses, Leventhal and Watts suggested that a strong avoidance motive was elicited by the high fear message with respect to getting X-rays because the behavioral response leads to the detection of the danger. They emphasize that the

unpleasant feelings and ideas stimulated by the high fear message led to the avoidance behavior. The parallel response model suggests that subjects should be concerned with the control of fear rather than the control of danger when fear cues are very strong, such as immediately after exposure to a highly threatening message and when approaching the threat. In this case, the only thing the X-ray can do is indicate whether a person has lung cancer, in other words, whether they have approached the threat. In addition, the X-ray behavior was measured immediately after exposure to the messages whereas the reduction in cigarette smoking was accomplished after some time had passed. The immediacy of the X-ray behavior measure and the fact that the behavior represents approaching a threat would result in the arousal of the fear control process. When the fear control process is activated a person becomes concerned about the possibility of getting lung cancer and the consequences of the disease (portrayed in this case as a lung operation). The coping mechanism of fear control would necessitate avoiding any such threatening information, which, in this case, would mean avoiding the possibility of discovering one has lung cancer by getting an X-ray.

Additional support for Leventhal's (1970) Parallel Response Model comes from a variety of studies that investigated the relationship between subjects' ability to cope with fear and their reactions to a threatening persuasive message. One study dealing with tetanus inoculations (Dabbs & Leventhal, 1966) suggested that under high levels of fear arousal some people may experience an inability to effectively cope with danger. Specifically, this study found that people high in self-esteem (which was interpreted as a measure of coping due to previous research) had stronger intentions to get a tetanus shot after receiving a high fear rather than a low fear message. However, low self-esteem subjects showed a decrease in intentions to get tetanus shots after the high fear

message. The researchers concluded that the reduction in expressed intentions reflected a temporary disintegration of coping responses.

Although these studies provide some partial support for Leventhal's ideas about the processes of danger control and fear control they do not represent an adequate test of the Parallel Response Model. Only one study has been published in which an attempt was made to explicitly manipulate the danger control and fear control processes (Rosen, Terry, & Leventhal, 1982). However, there were no effects on either attitudes or intentions to adopt the message recommendations as a result of the fear manipulations. So the evidence supporting this model is limited.

Protection Motivation Theory. Protection motivation theory (Rogers, 1975) is the most recent theory describing and interpreting the relationship between fear and persuasion. This theory shares a key assumption with Leventhal's (1970) parallel response model in that both theories assume that the emotional arousal of fear is less important to the persuasive process than a person's cognitive evaluation of the threatened event or problem. However, Rogers criticized Leventhal for being too vague about the specific variables that should predict the extent to which fear control and danger control processes operate so that it was impossible to derive precise predictions about the relationship between fear and persuasion. This model then, attempts to systematically specify the variables necessary to understand the impact of fear arousal on persuasion.

Specifically, Rogers (1975, p. 97) specified 3 factors that induce people to either accept or reject recommendations regarding potential health hazards. These factors are: "(a) the magnitude of noxiousness of a depicted event; (b) the conditional probability that the event will occur provided no adaptive activity is performed or there



is no modification of an existing behavioral disposition; and (c) the availability and effectiveness of a coping response that might reduce or eliminate the noxious stimulus." Rogers proposed that the extent to which these three components are perceived by the message recipients is due to the extent to which they are present in a persuasive message. The perceptions of these three components then combine in a multiplicative fashion to produce a state that Rogers called protection motivation. This state refers to the message recipients' drive or motivation to take action to avoid a potential threat. To summarize, the greater the noxiousness of the health threat, the probability of its occurrence, and the efficacy of recommended coping actions result in arousing the desire to protect oneself from the threatened event. According to Rogers, each of these three components must be present in order to develop protection motivation. If any one of the components is absent (so that its value is effectively zero) the state of protection motivation will not be aroused (due to the assumed multiplicity of the three components). As protection motivation increases, the amount of attitude, intention, and behavior change in response to the recommendations presented in the persuasive message will increase.

Although the three components of a fear appeal specified by Rogers (1975) make sense theoretically and intuitively, the research results have not supported their importance in the fear appeal literature. In several experimental investigations on topics including safe driving, saving energy, smoking, and venereal disease (Hass, Bagley & Rogers, 1975; Griffeth & Rogers, 1976; and Maddux & Rogers, 1983) manipulations of the three components of a fear appeal that are necessary to produce a state of protection motivation (noxiousness, probability, and efficacy) did not combine multiplicatively as predicted. In these studies the only variable that had a consistent

influence on persuasion was the noxiousness manipulation and in one of the studies (Maddux & Rogers, 1983) this effect was only marginally significant.

Furthermore, many investigations into the relationship between fear and persuasion have used successful message manipulations of fear arousal that do not include information corresponding to the three components that Rogers hypothesized were essential. Some of these studies, as stated earlier, do find that fear arousal influences persuasion even without all three of these components, although Rogers predicts that if any one of the components does not exist persuasion will not occur. Rogers himself later questioned his ideas about the multiplicative property of the combination of these three components and he concluded that they do not combine in the manner that he had originally expected (Rogers, 1985) although he did not propose a new method of combination.

### Evaluation of Previous Theoretical Positions.

The most serious criticism that can be brought to bear against any theory is that it does not adequately account for the data. This criticism has been levied against each of the theories described above. Overwhelmingly, the meta-analysis and the review articles that have intensively investigated the experimental evidence have concluded that the evidence just does not support any of the three theories that have been postulated to explain the relationship between fear and persuasion (Boster & Mongeau, 1984; Beck & Frankel, 1981; Higbee, 1969; Sutton, 1982). While the specific criticisms that have been directed against each of the theories are valid and worthy of concern, it is more important for the purposes of the present paper to examine the problems that are associated with this group of theories as a whole.

The most significant problem with all of the mentioned theories is that they specify only the persuasion process as it relates to fear instead of incorporating the effects of fear into a more general theory of the persuasion process. Theories attempting to understand fear appeals have failed to consider important components of the message and the situation as a whole that might be influencing persuasion. One commonly neglected but important variable is the quality of the persuasive message. A message containing extremely poor, specious arguments will not be persuasive whether fear is aroused or not. Experimental investigations arising out of these theories have then neglected to assess or consider possible message and situation components and the effects that they might have on the research results. A major goal of the present research is to develop a theoretical framework of the relationship between fear and persuasion based on an understanding of how persuasion occurs in general. The theoretical position that is proposed in this paper attempts to address this issue specifically.

#### Insights into the Fear-Persuasion Relationship from Dual-Process Models.

Dual process theories of persuasion like the Elaboration Likelihood Model (Petty & Cacioppo 1986a; 1986b) and the Heuristic Systematic Model (Chaiken, 1980) are currently the most general persuasion theories, both explaining the effects of a variety of different variables on the persuasion process. According to the Elaboration Likelihood Model, there are two separate routes through which persuasion can occur: the central route and the peripheral route. The term elaboration likelihood refers to the extent to which people think about issue-relevant arguments in the persuasive message; this is posited to be the key moderator of persuasion. When people's motivation and



ability to carefully scrutinize a persuasive message is high, they are said to be in the central route to persuasion where the extent of attitude and/or behavior change is determined by the nature and direction of cognitive elaborations. If the quality of the persuasive argument is high, favorable thoughts regarding the message will predominate and attitude and/or behavior change will occur in the direction specified by the persuasive appeal. If the quality of the argument is low, unfavorable thoughts will predominate and persuasion will not occur. When people are either not motivated or not able to engage in cognitive elaborations, they are said to be in the peripheral route to persuasion. In this case, persuasion can be the result of a variety of variables that have an effect in the absence of argument scrutiny such as the length of the message or the credibility of the source of the message. The primary determinants of whether a person will engage in cognitive elaborations or not are a person's motivation and ability to do so. Several variables have been specified as having a role in determining motivation and ability, such as the personal relevance of the topic; personality variables such as need for cognition; characteristics of the situation such as the presence of distractions and the opportunity for message repetition; and characteristics of the message itself such as difficulty and comprehensibility.

The Heuristic Systematic Model, like the Elaboration Likelihood Model, posits two paths to persuasion. The systematic path corresponds to the central route to persuasion while the heuristic path corresponds to the peripheral route to persuasion. Although the two models have important differences (see Eagly & Chaiken, 1993, p.326-345) they will be considered alike in this paper as they have similar conceptions regarding the two routes to persuasion and the antecedents and consequences of processing modes.

The arousal of fear can impact persuasion in very specific ways that can be elucidated by these dual process models. Fear can influence the amount of persuasion in three different ways according to the ELM and HSM. The first method is that fear can serve to direct message recipients to central route processing by motivating individuals to more carefully process the contents of the message. Fear can also serve, in a manner similar to a distractor, to inhibit individuals from having the necessary cognitive capacity to carefully process the arguments of a persuasive message which would induce message recipients to engage in peripheral route processing.

In both of these functions, as a motivator or distractor, fear arousal would have an impact on the amount and direction of cognitive elaborations in response to the message which would have differential effects on the amount of persuasion depending on the characteristics of the persuasive message. A message containing very strong and convincing persuasive arguments would benefit from extensive message processing. People would, in essence, be unable to refute the arguments and would find themselves agreeing with the content of the message. In this situation, persuasion would be enhanced if fear arousal increased motivation to elaborate. On the other hand, a message containing very weak persuasive arguments would be vulnerable to counterarguments if individuals have the motivation and cognitive capability to carefully scrutinize the message. In this case, persuasion will be inhibited by the motivation and ability to engage in cognitive elaboration. Fear serving as a distractor would have the opposite effect. A weak persuasive message would benefit from an individual's inability to carefully process the arguments in the message. People who are distracted by fear would be unable to find the weaknesses in the arguments and would be persuaded regardless of argument quality. A strong argument, on the other hand,

loses its persuasive advantage when people are unable to engage in extensive cognitive elaborations.

Furthermore, since a lack of ability to engage in extensive cognitive elaborations activates peripheral route processing, message recipients will search the environment for a cue to influence their decision about whether or not to accept the message recommendations. In this way, variables other than fear and message quality such as source credibility, message length, or message vividness can influence the extent of attitude and behavior change that occurs.

The third manner in which fear could influence persuasion, according to the Elaboration Likelihood Model and the Heuristic Systematic Model, is to serve as a peripheral cue or a heuristic. In the event that, on exposure to a persuasive communication, receivers are either not motivated or not able to engage in even minimal cognitive activity, they will search for another characteristic of either the message or the situation to guide the decision process. An example of a peripheral cue is the communicator's credibility. If a trustworthy or knowledgeable source is providing the persuasive message, it will serve as a cue that the message is believable and will enhance persuasion. In the terminology of the Heuristic Systematic Model, people have learned a heuristic, or problem solving strategy, that credible sources should be believed. Fear can have an effect on persuasion as a peripheral cue in a manner similar to that proposed in Janis's (1967) Fear Drive Model. This model states that it is not the fear raised by the message itself that influences the amount of persuasion, but rather, it is the reduction of fear that is associated with the learning of the message's recommendations that increases persuasion. In this case, when a person is afraid in response to a particular threat and then experiences a reduction of fear when learning how to avoid that threat, the fear and its subsequent reduction can serve as a

cue that the recommended methods of avoiding the threat are effective. The person is thus persuaded to accept the recommendation. As such, fear, or the reduction of fear, can enhance persuasion in the absence of careful message appraisal.<sup>1</sup>

To summarize, the application of the Elaboration Likelihood and Heuristic Systematic Processing Models can increase our understanding of the effects of fear on persuasion. According to these models, fear can influence persuasion in three different ways. Fear can increase message elaboration by motivating increased scrutiny of the arguments in a persuasive message; fear can reduce message elaboration by distracting thoughts away from the persuasive message; and fear can serve as a peripheral cue or heuristic.

The dual-process models of persuasion also serve to clarify the conflicting results found in the fear appeal literature. The effect of fear on persuasion depends, in large part, on the quality of the persuasive message. Fear arousal will be positively related to the amount of attitude or behavior change in situations where fear increases motivation to carefully think about and evaluate a strong and convincing persuasive appeal. When the persuasive appeal is not convincing and fear increases motivation to evaluate the message, fear will be inversely related to persuasion. Furthermore, fear would have different effects on persuasion if the arousal of fear is distracting, such that the message recipient focuses attention on the experience of fear rather than the persuasive message. In this case, differences in argument quality will not have a strong effect on the extent of persuasion. Instead, message recipients may focus on peripheral cues or heuristics such as the credibility of the source of the message or the vividness of the

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<sup>1</sup>It is also possible that fear arousal itself will serve as a peripheral cue. Fear as a peripheral cue could lead to message acceptance because it induces people to infer they are worried about the topic of the message and should, therefore, adopt the recommendations (similar to Self-Perception Theory: Bem, 1972). On the contrary, people may be motivated to avoid the experience of fear and, as such, defensively avoid the contents of the message. It is not clear from the model what the effect of fear as a peripheral cue would be.



accompanying pictures. Fear as a peripheral cue itself can also cause different results. The extent of persuasion may depend on the amount of fear reduction accompanying the learning of the message recommendations.

### Review of Selected Methodological Issues

In addition to the described problems regarding past theoretical conceptualizations of how fear has an impact on persuasion, there have been several methodological issues that may have contributed to the conflicting research results regarding the effects of fear on persuasion. Two of these issues that will be addressed in the present study include the problem of confounding variables in fear appeal studies and the problem of how fear has been operationalized in previous empirical studies.

#### Confounding Variables in Fear Appeal Research

Fear has often been confounded with a variety of other variables in much of the research regarding fear appeals. This problem was sometimes very extreme such as in Janis and Mann's (1965) study in which the high fear condition involved role playing while the low fear condition did not. In other cases, the possible confounds were less extreme; many studies used two different film clips for the high and low fear messages. A good example of the number of variables that were often confounded with fear in this research is the best-known study in this area, Janis & Feshbach's (1953) work on a dental health persuasive message. The researchers manipulated three levels of fear arousal: low, medium, and high. A content analysis of the messages reported in the study revealed a number of differences in the messages in addition to the manipulation

of fear. As the messages induced more fear they were also longer, were accompanied by more slides, contained more vivid imagery, used more personal references (such as "It could happen to you"), and portrayed more danger and more serious consequences from failure to comply with the recommendations. As a result, it is not clear whether the observed differences in behavior were due to the amount of fear aroused or to any one of these other factors.

Researchers have made attempts to control for many of the possible confounding factors but, as of yet, have failed to do so adequately. Some researchers have been careful to keep the message length and other characteristics of the message constant while varying the content of the messages. Leventhal and Singer (1966) used messages of equal length with the same number of accompanying slides but varied the consequences depicted, the extent of emotional language used, and the vividness of the slides. Other researchers have kept the central message content constant while adding a passage to invoke fear in the high fear condition. For example, one study (Janis & Terwilliger, 1962) gave subjects the same 15 paragraph message about the unfavorable consequences of smoking and then presented subjects in the high fear condition with an additional 7 paragraphs emphasizing the painful and dire consequences of lung cancer. In all of these cases, the persuasive messages have differed in at least one factor in addition to fear.

One goal of the present research is to eliminate the problem of confounds by separating the fear arousal manipulation from the persuasive message. Although this may be considered problematic in that the results may not be generalizable to other research in which the message constitutes the fear manipulation it is currently more important to clearly understand the processes involved in the relationship between fear

and persuasion and to subsequently apply these findings to situations where the message serves as the fear arousal manipulation.

### Operationalizations of Fear

A third problem with traditional fear appeal research and theory concerns the issue of how to operationalize fear. Researchers have not agreed on what, exactly, constitutes a fear appeal. According to Protection Motivation Theory (Rogers, 1975), in order for a fear appeal to enhance persuasion it must contain information about the three crucial components: the severity or noxiousness of the threat, the probability that the threatened event will occur, and the efficacy of the recommended coping response. As stated earlier, high levels of all three of these components are supposed to indicate a successful fear appeal but studies using this theoretical approach rarely measure fear arousal in the message recipients, so it is unclear whether fear is being manipulated at all as these other variables are manipulated. In those studies that do measure fear arousal, noxiousness of the threat has been shown to have an effect on fear although this effect does not replicate consistently (Maddux & Rogers, 1983).

Leventhal's (1970) Parallel Response Model contains another conceptualization of fear appeals. He noticed that fear appeals tend to contain two different types of fear information and concluded that the different information activated the two different cognitive coping processes: fear control and danger control. Although Leventhal has been criticized for not specifying the stimulus conditions that lead to the fear and danger control processes (Beck & Frankel, 1981) research on anticipatory versus inhibitory fear (Leventhal & Trembly, 1968) can be used to clarify this point. Components of a fear message that pertain to information about a person's vulnerability



to the described threatening event can be construed as information that the person is in danger. This would activate the danger control process during which a person will search the environment for ways to reduce this danger, and will therefore be more likely to accept the recommendations advocated in a persuasive message. Similarly, information on the consequences of the threatened event, which is usually gory, will activate the fear control process during which a person will be motivated to avoid the experience of fear arousal. In this case, a person will attempt to avoid thinking about the threatened event and will likely not be persuaded to adopt the message's recommendations.

This conceptualization of different types of fear information fits nicely into our present integration of the fear appeal literature in the framework of the dual process theories of persuasion. It can be assumed that the danger control information in a fear message functions as a motivator. When people feel that they are in personal danger, they will be more likely to carefully scrutinize a persuasive message, engaging in extensive cognitive elaboration. If the persuasive message presents a strong argument, these people will be more persuaded; if the message presents a weak argument, these people will be less persuaded. The fear control information in a fear appeal has its impact on the persuasion process either to interfere with cognitive ability or as a peripheral cue. On one hand, the fear control process, especially when intense, can serve as a distraction inhibiting cognitive elaboration so that the amount of persuasion resulting from a weak message will be enhanced while that resulting from a strong message will be inhibited. On the other hand, the amount of fear experienced can serve as a peripheral cue, influencing persuasion, or the lack thereof, by its mere presence without the necessity of thinking about the message.

In general, the research studies that have been conducted on the relationship between fear and persuasion have used a variety of methods to attempt to arouse fear. These methods include the gory and disgust-provoking films of lung operations described above (Leventhal & Niles, 1964), vivid pictures of cancerous mouths and diseased teeth (Janis & Feshbach, 1953), asking subjects to imagine the consequences of becoming infected with a new variety of Asiatic virus (Rogers, 1985), presenting material to naval training recruits prior to a stressful experience of being exposed to tear gas (Helmreich, Kuiken, & Collins, 1968), the presentation of needles and blood-sampling paraphernalia present in the room (Sigall & Helmreich, 1969), false physiological feedback concerning heart rate and skin conductance (Harris & Jellison, 1971), misattribution of arousal (Schwarz, Servay, & Kumpf, 1985), reading information with personal references relating to pain and discomfort (Nunnally & Bobren, 1959), the threat of nuclear war (Cope & Richardson, 1972) and role-playing fear-arousing situations such as hearing from a doctor that you have just been diagnosed with cancer (Janis & Mann, 1965). With such extensive differences in how researchers have attempted to arouse the emotion of fear, it is not surprising that each of these different methods has resulted in different patterns of findings regarding the impact that fear has on the acceptance of a persuasive message.

Related to the issue of how fear is manipulated and operationalized is the assumption that all research studies investigating the relation between fear and persuasion are actually investigating the same phenomena. All of these studies have labeled the concept they are interested in as a "fear" appeal or a "threat" appeal. There is an implicit assumption in this literature that any manipulation of emotion to a negative and potentially harmful event is fear. However, it is possible that the only thing these studies really have in common is that they arouse different kinds of negative

affective responses to different topics (Higbee, 1969). The idea that fear arousing manipulations might really be arousing different negative responses may have been made evident by examining the list of ways that fear has been manipulated. One common method for arousing fear has really been the arousal of disgust -- showing bloody and vivid color pictures of diseased or injured body parts. It is not clear whether this is actually a manipulation of fear. Another study that was considered to be an investigation of fear appeals was actually explicitly manipulating the arousal of guilt in addition to the arousal of fear (Wheatley & Oshikawa, 1970). The topic of this fear appeal study was purchasing life insurance; the high fear message included statements wondering whether the message recipients' families would be provided for in the event of the subjects' untimely deaths.

The idea that different types of fear might be relevant to the question of the relationship between fear and persuasion is not new. Janis and Leventhal (1968) originally suggested that one possible reason that fear motivates some people, but not others, is that messages might arouse different kinds of fear. The arousal of "neurotic anxiety" may cause subjects to try to reduce fear by eliminating thoughts about the danger through repression, denial, or defensive avoidance while the arousal of "realistic fear" may cause subjects to take realistic action toward reducing the danger they face such as by adopting the recommendations provided by the persuasive communication. Other researchers continued to discuss the possibility that different types of fear might induce different reactions to persuasive messages. Leventhal and Trembly (1968) noticed that their fear manipulation created two distinct fear states in subjects. "Anticipation fear" seemed to be caused by descriptions of potential dangers and threats and was characterized by muscular tension that led subjects to pay attention to specific methods to avoid an upcoming threat. "Inhibitory fear," on the other hand,

seemed to follow from descriptions of destruction, harm, and consequences of threats and was accompanied by inner tension and nausea that led to feelings of depression. Leventhal (1970) continued hypothesizing about the different effects of different types of fear in his parallel response model where he posits the two different coping responses of fear control and danger control as arising out of different types of fear.

Another indication that researchers might actually be manipulating different negative emotions or, at least, different types of fear can be found in the manipulation checks that investigators use to measure the effectiveness of their manipulations of fear arousal. Researchers generally use a composite measure of several self-report scales to assess their manipulations of fear, but these measures consist of different response scales in different research studies. Many studies use scales including nausea, depression, panic, anger, tension, disgust, nervousness, and/or discomfort (Leventhal & Watts, 1966; Leventhal & Trembly, 1968; Leventhal & Singer, 1966). These words definitely denote negative affective states but it is unclear whether they correspond to fear. Other studies ask subjects if they are feeling anxious, (Miller & Hewgill, 1966; Moltz & Thistelthwaite, 1955) worried, or concerned (Chu, 1966; Janis & Feshbach, 1953, 1954) and still others ask outright for reported fear (Dabbs & Leventhal, 1966; Leventhal & Niles, 1965).

For the purposes of the present research, it was assumed that fear arousal occurs when a person feels vulnerable or at risk for a negatively-valanced event. This is similar, in essence, to Rogers' (1975) necessary components of a fear appeal in that it was expected that a noxious event that is deemed probable would elicit the emotion of fear. However, perceived vulnerability to an undesirable event is not the sole determinant of the experience of fear. In addition, it was assumed that some emotional reaction to the potential consequences of the undesirable event is also necessary. As



such, the fear appeal used in the present study induces a feeling of personal vulnerability or risk for an undesirable consequence but also includes a thought-listing task to ensure that people focus on the negative consequences that might result from their personal vulnerability.

### Hypotheses

To address all of the mentioned issues in the present study, we examined the different properties of a fear appeal by manipulating the amount of fear aroused and the relevance of the aroused fear to the topic of the message. There were 3 levels of this fear manipulation: a relevant fear arousal condition, an irrelevant fear arousal condition, and a no fear arousal condition. Subjects were then presented with a persuasive message containing specific behavioral recommendations to avoid the threatened event. These messages varied only in terms of the quality of the arguments; in one version, the message contained strong and persuasive arguments while in another version, the arguments were weak and specious. This message quality manipulation contained an additional level for comparison purposes in which only a minimal message was presented to subjects. Following the message manipulation, measures of persuasion were assessed including message related thoughts, attitudes, and intentions to follow the message recommendations.

It was expected that a state of fear, in the form of an increased belief in one's personal vulnerability, would have both motivating and distracting effects. However, it was expected that the motivating effect of *relevant* fear arousal concerning the message topic would be stronger than the distracting properties. Relevant fear as a motivator would influence persuasion in a manner similar to the danger control process. When



perceived vulnerability to danger is high, subjects would be induced to engage in extensive cognitive elaboration, thinking carefully about all aspects of the persuasive message. If that message presented strong arguments, those arguments would be accepted and persuasion enhanced. If the message presented only weak arguments, they would be counterargued and rejected so that persuasion would be inhibited. It was specifically hypothesized that under conditions of relevant fear arousal there would be a greater disparity in persuasion based on message quality than when fear was not aroused. In terms of the Elaboration Likelihood Model and the Heuristic Systematic Model, this would be viewed as central route or systematic processing.

A general state of fear, not specific to the topic of the persuasive message, would also influence persuasion according to predictions derived from the dual-process theories. In the case of external or *irrelevant fear*, it was expected that fear would serve mainly as a distractor, impairing a person's ability to evaluate the persuasive message. Under irrelevant fear, strong and weak messages would be equally effective because message recipients would be unable to effectively counterargue the contents of the weak message as compared to conditions in which fear is not aroused. In terms of the Elaboration Likelihood Model and the Heuristic Systematic Model, irrelevant fear would provide the impetus for directing people to rely on peripheral cues or heuristics rather than the quality of the persuasive message. In this case, situational or message factors, such as source credibility or message length, could have a greater influence on persuasion than the quality of the message.

As stated earlier, fear can also influence persuasion by serving as a peripheral cue or heuristic when extensive cognitive elaboration does not occur. It was hypothesized that fear, both relevant and irrelevant to the topic of a persuasive message, would influence persuasion by serving as a peripheral cue. The arousal of fear and its

subsequent reduction on learning the message recommendations can serve as peripheral cues, alerting message recipients that the recommendations are effective and should be adopted. If so, the arousal of fear might alert subjects that they were concerned about the described threat and should, therefore, be more likely to accept the recommendations advocated by the persuasive message. The reduction of fear associated with learning the message recommendations would increase persuasion resulting in more positive attitudes and intentions when fear is aroused than when fear is not aroused. We expected to find that the mere presence of fear enhanced persuasion, as such, we hypothesized a greater amount of persuasion would occur under both fear arousal conditions than under the no fear arousal condition when the persuasive message was minimal.

To summarize the hypotheses, we expected that fear could serve as both a motivating and distracting force in a persuasion setting. If fear functions as a motivating force, which was expected when the fear aroused was relevant to the topic of the persuasive message, persuasion would be dependent on message quality. Specifically, persuasion would be enhanced for strong messages and inhibited for weak messages to a much greater degree than when fear was not aroused. If fear functions as a distracting force, which was expected when the fear aroused was irrelevant to the topic of the persuasive message, persuasion would be less dependent on the quality of the persuasive message. Differences in both attitude and intention measures between the strong and weak messages would be smaller than when fear was not aroused. Finally, if fear serves as a peripheral cue, persuasion would be enhanced under conditions of fear arousal regardless of the quality of the persuasive message.

## CHAPTER 2

### PILOT RESEARCH: METHODOLOGY AND RESULTS

Preliminary research was conducted in order to select topics in which fear could be aroused in college students, to refine the methodology of the fear arousal manipulation, and to develop and test the quality of persuasive messages for the main research study. Two separate pilot studies were conducted. The first investigated the fear arousal manipulation and the second investigated the manipulation of persuasive message quality<sup>2</sup>

#### Pilot Study 1: Methodology

##### Subjects

Forty-five students from undergraduate psychology courses volunteered to participate in a survey. Students received either extra credit in their psychology class or candy in exchange for their participation.

##### Design

Subjects were randomly assigned to one cell of a 2 (fear arousal: high vs. none) x 2 (topic: early heart disease vs. peptic ulcers) factorial design. Subjects were run in two large group sessions.

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<sup>2</sup> Previous pilot research had been conducted to select topics in which fear could be aroused and manipulated. The results of these studies will not be reported here except to say that the topics of peptic ulcers and early heart disease were the only ones in which different levels of fear could reliably be aroused. Other topics included in these investigations were gastritis, hypertension, nutrition-related diseases, breast cancer, automobile accidents, and becoming the victim of a violent crime.

## Procedure

On arriving at the laboratory, the experimenter explained to the subjects that they would be completing a short questionnaire regarding their current behaviors relating to a particular health topic. Subjects then received and filled out a risk assessment questionnaire, computed their risk score, and then rated how likely they felt it was that they would develop the health problem about which they had answered the risk assessment questions. In addition, they rated their experience of fear regarding the possibility of developing the health problem and they evaluated the risk assessment questionnaire.

Subject ratings of the likelihood that they would develop the particular health problem, the extent to which they felt vulnerable to developing the problem, and the extent to which they felt at risk were combined to form a measure of feelings of vulnerability. A measure of fear arousal was computed by using subject ratings on 7-point scales of how they felt after completing the risk assessment questionnaire (worried, frightened, concerned, nervous, scared, and tense). Subjects also evaluated the risk assessment questionnaire in terms of the extent to which it was worthwhile, informative, believable, convincing, trustworthy, and valid. These scales were combined to form a composite measure of perceived validity. Alpha reliability for all of these scales was high (vulnerability  $\alpha = .95$ ; experienced fear arousal  $\alpha = .93$ ; perceived validity  $\alpha = .90$ ).

After completing the risk assessment questionnaire and the dependent measures subjects were thoroughly debriefed. The experimenter explained the hypotheses of the survey and emphasized that the risk information was not accurate and that, in certain conditions, the risk assessment questionnaire was specifically designed to make them feel particularly vulnerable to facing the described health problem while in other conditions,



the questionnaire was designed to make them feel that they were not at risk for the health problem.

### Risk Assessment Questionnaire

The purpose of the risk assessment questionnaire was to either arouse subjects' fear regarding their potential risk for one of the two health topics or to reassure them about their potential risk for the specific health topic. The questionnaires consisted first of a description of the health problem to be assessed. The description contained information regarding the symptoms and possible effects of the disease and mentioned that although there are physiological and hereditary causes of the disease, a person's lifestyle and behavior are more important determinants of whether or not the disease develops. Subjects were instructed to use the attached questionnaire to help them determine whether their lifestyle and behavior patterns are putting them at risk for developing the described health problem. These descriptions, as well as the four versions of the risk assessment questionnaires, are reproduced in Appendix A.

Following the descriptions of the health problem, subjects filled out a questionnaire that ostensibly assessed whether their current behaviors were putting them at risk for that particular problem. The items on the questionnaire were phrased in such a way as to indicate that subjects' current behaviors either put them at a high risk for the particular illness they were assessing or put them at a low risk. This was accomplished in a manner similar to Salancik's (1975) method of manipulating salient cognitive sets. The wording of the items and the response options provided on the questionnaires were such that most subjects were forced to choose the answer that indicated they were either at a high risk or a low risk depending on their experimental condition. For example, one question on the



high fear heart disease questionnaire read "Stress and tension have been directly linked to the development of early heart disease. Do you *ever* feel so severely stressed or tense that you cannot function effectively?" "Yes" and "No" were the responses options provided. It was expected that most people have occasionally engaged in risky behaviors and that these measures made their risky behaviors more salient, forcing subjects to consider themselves more vulnerable to either peptic ulcers or heart disease.

Subjects were made to feel that they were not at risk for the described health problem by changing the wording of the questions to force respondents to answer in such a way as to indicate that they were at a very low risk for the health problem. One item on the low fear version of the heart disease risk assessment questionnaire read "Stress and tension have been directly linked to the development of early heart disease. Do you *always* feel so severely stressed or tense that you cannot function effectively?" "Yes" and "No" were the response options provided. It was expected that few people engage in these behaviors all of the time and so would be forced to respond in a way that put them at a low risk for the health problem.

After completing the risk assessment questionnaire, subjects were instructed to score their questionnaire by counting the number of "risky" answers they had given and circling a number on a scale that corresponded to their score. The scale indicated that scores ranging from 0 to 3 represented a low risk for the health problem while scores ranging from 4 to 10 represented a high risk for the health problem.

Following the risk assessment scoring, subjects were asked to imagine what it would be like to develop the relevant health problem (high fear conditions) or to imagine what life would be like without developing the health problem (no fear conditions). They then listed either the worst consequences and disadvantages of developing the health problem or the best benefits and advantages of not developing the problem. They were provided

with six lines to list the advantages or disadvantages. The risk assessment questionnaires are reproduced in Appendix A.

### Pilot Study 1: Results

A 2 (topic) x 2 (fear arousal) analysis of variance was conducted on the ratings subjects made after filling out the risk assessment questionnaire. Risk scores based on the number of questions answered in a risky direction demonstrated that the risk assessment questionnaires manipulated vulnerability successfully. A significant main effect of fear arousal across both topic conditions showed that subjects agreed with a higher number of risky responses in the high fear arousal condition (mean = 7.05) as compared to the no fear condition (mean = 1.48;  $F(1, 44) = 184.333, p = .000$ ). There was also a marginally significant main effect for topic such that subjects agreed with a higher number of risky behaviors on the peptic ulcer questionnaires (mean = 4.52) than on the heart disease questionnaires (mean = 3.80;  $F(1, 44) = 3.03, p = .09$ ). There were no significant interactions on risk scores.

There were also significant main effects for the fear arousal manipulation on average ratings of perceived vulnerability for developing the relevant health problem and on average ratings of fear arousal. Specifically, pilot subjects in the high fear condition rated their perceived vulnerability as higher (mean = 4.18) than subjects in the no fear condition (mean = 2.46;  $F(1, 44) = 21.975, p = .000$ ). Subjects in the high fear condition also reported experiencing more fear (mean = 3.54) than subjects in the no fear condition (mean = 2.58;  $F(1, 44) = 5.60, p = .02$ ). In addition, there was a non-significant trend for the heart disease questionnaires to elicit more fear (mean = 3.38) than the peptic ulcer questionnaires (mean = 2.78;  $F(1, 44) = 2.78, p = .14$ ) although there were no topic

differences on ratings of perceived vulnerability. There were also no interactions for fear arousal or perceived vulnerability ratings.

These results indicate that the fear arousal manipulation was successful. Subjects reported experiencing more fear arousal and had greater perceptions of vulnerability after receiving the high fear version of the risk assessment questionnaire rather than the no fear version. There was a trend for the risk assessment questionnaire dealing with heart disease to elicit more fear but that is not surprising considering the severity of heart disease as compared to peptic ulcers.

Although there were differences in the fear arousal and vulnerability ratings in response to the fear manipulation, the risk assessment questionnaires did not differ in terms of subjects' general evaluations of the worth of these questionnaires. Ratings on the extent to which the risk assessment questionnaire was seen as worthwhile, informative, believable, convincing, trustworthy, and valid did not differ based on either topic or fear arousal manipulation.

### Pilot Study 2: Methodology

The purpose of the second pilot study was to develop and test the quality of the persuasive messages used in the main study.

#### Subjects

Fifty-four students from undergraduate psychology courses volunteered to participate in a survey regarding health communications. Students received extra credit in their psychology courses in exchange for their participation.

## Design

Subjects were randomly assigned to one cell of a 2 (topic: early heart disease vs. peptic ulcer) x 2 (message quality: strong vs. weak) factorial design. Subjects were run in 3 large group sessions.

## Procedure

On arriving at the laboratory, the experimenter explained to the subjects that she was interested in finding out what students thought about a new health-related product. Subjects were told that they would be receiving a copy of a newspaper article that described the new product and would be asked to respond to several opinion questions after they read the article. Subjects then received one of the versions of the persuasive message after which they responded to a variety of dependent measures to assess their evaluation of the message.

Subjects indicated the extent to which they thought the product was beneficial and worthwhile and whether they believed the product would help people at risk for the particular health problem it was designed to alleviate. Subjects also indicated whether they would be interested in the product and in finding out more information about the product if they were at risk for the particular health problem. They also made an overall evaluation of how convincing the article was. All of these ratings were made on 7-point scales.

In addition to the overall evaluations of the message, subjects received a questionnaire that listed each individual persuasive argument or feature of the product and indicated the extent to which each of these arguments convinced them that it was a good product and a



worthwhile feature. They also rated the extent to which each of the specific arguments was convincing. All ratings were made on 7-point scales.

### Persuasive Messages

The persuasive messages were written and presented as newspaper articles from a fictitious source. The articles all described a new product being developed by a company, Medivax Corporation, to help reduce the possibility of developing one of the two health problems: early heart disease or peptic ulcers. Messages varied in terms of the quality or strength of the persuasive arguments used to describe the new products.

Each message contained 11 main arguments. In the strong messages, the product was described as being in an advanced stage of development and testing and as having been already approved by the Federal Drug Administration. In the weak messages, the product was described as being in an initial stage of development and testing and as not yet having been approved by the Federal Drug Administration. In addition, each message contained arguments that indicated either that the product had legitimate reasons for being of potential benefit for the health problem or as having ridiculous reasons for being of potential benefit.

For example, the strong message for the metabolic abdominizer, the product designed to reduce the development of peptic ulcers, stated that the abdominizer stimulates the abdominal region to elevate metabolic processes that prevent peptic ulcer development. In particular, the message continued, the abdominizer increases production of certain hormones crucial to the body's ability to repair and prevent internal damage, aid in the digestive process, and control stress reactions. The weak message for the metabolic abdominizer stated that the abdominizer delivers electric shocks to the abdominal region



which serves to distract people from their meals and any stress they experience and that it increases the production of hormones that mask pain so that people would not experience the discomfort of peptic ulcer development. Reproductions of the strong and weak persuasive messages for both topics can be found in Appendix B.

### Pilot Study 2: Results

A 2 (message topic: heart disease vs. peptic ulcers) x 2 (message quality: strong vs. weak) analysis of variance was conducted on all measures of message strength. For both message topics, the product described in the strong message was rated as a better product (mean = 4.31), more worthwhile (mean = 4.24) and more helpful for reducing disease risk (mean = 4.38) than the products described in the weak messages (quality mean = 3.12, worthwhile mean = 2.42, helpful mean = 3.12;  $F(1, 52) = 8.724, p=.005$ ,  $F(1, 52) = 19.35, p=.000$  and  $F(1, 52) = 9.614, p=.003$  respectively).

After reading the strong messages, subjects said they would be more interested in the products (mean = 4.86) and wanted more information about the products (mean = 5.28) than after reading the weak messages (means = 3.08 and 3.76;  $F(1, 52) = 13.840, p=.001$  and  $F(1, 52) = 7.911, p=.007$ ). In addition, subjects rated the strong messages as more convincing overall (mean = 4.38) than the weak messages (mean = 3.00;  $F(1, 52) = 19.345, p=.000$ ).

There were no significant differences between the topics in terms of argument quality but the product designed to reduce heart disease risk was rated as a marginally better product (mean = 2.88) than the product designed to reduce peptic ulcers (mean = 3.54;  $F(1, 52) = 2.46, p=.11$ ). A similar effect was found for subjects' ratings of how interested they would be in the product. Subjects were slightly more interested in the heart disease

product (mean = 2.54) as compared to the ulcer product (mean = 3.36,  $F(1, 52) = 2.90$ ,  $p=.10$ ).

In overall ratings of emotional arousal, there were no significant effects of either concern about the health problems mentioned in the persuasive messages and no differences in fear arousal about the possibility of developing the mentioned health problem. However, the weak messages were rated as being marginally more funny (mean = 5.00) than the strong messages (mean = 5.82;  $F(1, 52) = 2.646$ ,  $p=.11$ ). Additionally, although the messages did not differ in terms of ratings of how boring the article was, the messages about the product designed to reduce heart disease development was rated as slightly more interesting (mean = 2.92) than the messages about the peptic ulcer product (mean = 4.00;  $F(1, 52) = 3.77$ ,  $p=.06$ ).

In addition to rating the overall quality of the messages, subjects also rated each persuasive argument in terms of how convincing each argument was and the extent to which that particular feature was worthwhile and made the product beneficial. Average ratings of these three questions across all of the persuasive arguments indicated that subjects rated the persuasive arguments in the strong message as more convincing (mean = 2.53) than those in the weak message (mean = 4.14;  $F(1, 52) = 29.332$ ,  $p=.000$ ) and they rated the features in the strong message as being more worthwhile (mean = 2.24) and beneficial (mean = 2.36) than the features described in the weak message (worthwhile mean = 4.05, beneficial mean = 4.04;  $F(1, 52) = 41.826$ ,  $p=.000$  and  $F(1, 52) = 34.877$ ,  $p=.000$ , respectively).

The pattern of results for all of the dependent variables relating to message quality indicates that the manipulation was successful. On all rating scales, subjects indicated that the strong messages contained better arguments and were more convincing and persuasive than the weak arguments. In addition, ratings of the specific arguments indicate that

across the 11 arguments used to describe these health products, the product features described in the strong messages were better than the features described in the weak message.

## CHAPTER 3

### MAIN STUDY: RESEARCH METHODOLOGY

#### Subjects

Two hundred and twelve students from undergraduate psychology courses volunteered to participate in a survey regarding health issues. Students received extra credit in their respective psychology courses in exchange for their participation.

#### Design

Subjects were randomly assigned to one cell of a 3 (fear arousal: relevant, irrelevant, and no fear) x 3 (message quality: strong, weak, and minimal message) x 2 (message topic: early heart disease and peptic ulcer) factorial design. This included three control groups, two minimal message control groups with either topic-relevant or topic-irrelevant fear and one minimal message, no fear control group for comparison purposes. Subjects were run in group sessions ranging from 1 to 8 students participating at a time.

#### Procedure

On arriving at the laboratory, the experimenter explained to the subjects that the survey dealt with several issues regarding health-related topics. Subjects were told that in order to ensure that the survey would not take a long time to fill out the experimenters had randomly assembled a subset of survey materials in each questionnaire packet. As a

result, subjects might be answering questions on a few different topics or they might get all of the questions on the same topic. Subjects then signed consent forms and began.

Subjects first filled out one of the four versions of the risk assessment questionnaire described in the first pilot study. They then received one of the four persuasive messages or one of two brief articles (described below) comprising the minimal message control condition. After reading the message, subjects were asked to list the thoughts they were having while they were reading the persuasive message and they filled out a variety of questionnaires containing the attitude and intention measures. At the end of the questionnaire, the manipulation of fear arousal was assessed.

Following their completion of the questionnaire packet, subjects were thoroughly debriefed. The experimenter explained the hypotheses of the survey and emphasized that the risk information was not accurate and that, in certain conditions, the risk assessment questionnaire was specifically designed to make them feel particularly vulnerable to facing the relevant health problem while in other conditions, the questionnaire was designed to make them feel that they were not at risk for the health problem.

### Fear Arousal/Relevance Manipulation

The manipulation of different levels of fear arousal (high fear vs. no fear) was accomplished through the use of the risk assessment questionnaires described in the preceding chapter. Subjects filled out a questionnaire that ostensibly assessed whether their current behaviors were putting them at risk for either early heart disease or peptic ulcers. The items on the questionnaire were phrased in such a way as to indicate that subjects' current behaviors either put them at a high risk for the illness described in the questionnaire or put them at a low risk. After computing their level of risk based on the



risk assessment questionnaire, subjects were asked to imagine what it would be like to develop the relevant health problem (high fear arousal conditions) or to imagine what life would be like without developing the health problem (no fear arousal conditions). This method was very successful in manipulating the different levels of fear in the first pilot study.

The relevance of the manipulated fear arousal to the topic of the persuasive message was also manipulated through the use of the risk assessment questionnaires. For the fear arousal questionnaires, subjects either answered the questions concerning the same health topic about which they would later receive a persuasive message (relevant fear condition) or about the alternate topic (irrelevant fear condition). Fear arousal relevance was not manipulated in the no fear conditions.

### Message Quality Manipulation

Message quality was manipulated by using the strong and weak persuasive messages used in the second pilot study. For each topic, early heart disease and peptic ulcers, there was a strong, persuasive version of the persuasion message and a weak, unconvincing persuasive message. These are described in more detail in the preceding chapter. In addition to the strong and weak persuasive messages for each topic, some subjects were assigned to a minimal message control condition. As the health-related products were fictitious, it was expected that subjects would be unable to make the necessary attitude and intention ratings regarding either of the products described in the persuasive messages without a brief description of the product and its intended function.

Therefore, subjects in the minimal message control conditions each received a brief, factual description of the proposed product that described what the product was in a

very general sense and stated that the product was designed to reduce the development of the described health problem. This was also included in the experimental conditions. These messages did not include any of the arguments or descriptions of the features of the product that comprised the message quality manipulation in the longer versions of the messages described earlier. A copy of the articles given to subjects in the minimal message conditions is reproduced in Appendix C.

### Dependent Measures

#### Fear Arousal Manipulation Checks

After completing the risk assessment questionnaire, subjects computed their total risk assessment score as the preliminary subjects did in the first pilot study. Then, at the end of the questionnaire packet, subjects in the main study answered the same perceived vulnerability and fear arousal questions that the pilot study subjects had answered. This was placed at the end of all of the dependent measures to avoid sensitizing the subjects to the fear arousal manipulation. Again, alpha reliability for these two scales was high (vulnerability  $\alpha = .95$ ; experienced fear arousal  $\alpha = .88$ ).

#### Cognitive Elaborations

Immediately after reading one of the persuasive messages, subjects' cognitive elaborations were assessed in a manner adapted from Petty and Cacioppo (1977). Subjects read a statement designed to elicit their message related thoughts:

We are now interested in what you were thinking about during the last few minutes while you were reading the article. . . simply list what it was that you were thinking about during the last few minutes. Please write down the first idea that comes to mind on the first line, the second idea on the second line, etc. . . Please be completely honest and list all of the thoughts that you had. . . Only write down those thoughts that immediately come to mind. You should only spend 1 or 2 minutes on this and then go on to the next page.

Twelve lines were provided on which subjects were to write their ideas. These responses were then coded by two independent judges<sup>3</sup> in terms of being in favor of the product described in the persuasive message, against the product, neutral to the product, or irrelevant to the content of the persuasive message. Ratings in favor of the product, against the product and neutral to the product were combined to form a total index of message-relevant thoughts. Inter-rater reliability for the two judges was 86%; all differences were resolved through discussion.

### Attitude and Intention Measures

After completing the cognitive elaborations page, subjects indicated their attitude toward using the described product to reduce the risk of developing the relevant health problem. Attitude ratings were made on a series of 24 7-point semantic differential scales. These ratings were submitted to an exploratory factor analysis in which 3 factors were extracted. Examination of the factor loadings revealed that the first factor extracted corresponded to a measure of evaluative attitude, the second factor corresponded to a measure of affective attitude, and the third included only the semantic differential scale of selfish/unselfish. The ratings were then combined to form two attitude scales: an affective

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<sup>3</sup> Judges were blind to all experimental conditions with the exception of the topic of the persuasive message.

measure of attitude (pleasant/unpleasant, attractive/unattractive, beautiful/ugly, relaxing/stressful, enjoyable/not enjoyable, and positive/negative; reliability  $\alpha = .90$ ) and an evaluative measure of attitude (desirable/undesirable, interesting/uninteresting, good/bad, important/unimportant, useful/useless, wise/foolish, meaningful/meaningless, productive/unproductive, worthwhile/worthless, strong/weak, valid/not valid; reliability  $\alpha = .96$ ).

Subjects also responded to 6 questions designed to assess their behavioral intentions regarding the described product. These items included questions such as "I would be willing to try . . ." the described product and "If the price was affordable, I would buy . . ." the product. Responses to these six items were combined to form an average intention measure (reliability  $\alpha = .89$ ). An additional seventh intention question asked "All things considered, are you interested in the . . ." described product? All intention questions were answered by circling the appropriate number on 7-point scales.

## CHAPTER 4

### MAIN STUDY: RESULTS

#### Fear Arousal Manipulation Checks

The fear arousal manipulation in the main portion of the study had three levels (relevant, irrelevant, and none). However, analyses on the manipulation checks for fear arousal were collapsed into 2 (fear arousal: fear arousal vs. none) x 2 (topic: heart disease vs. peptic ulcer) design because the relevant fear manipulation for each topic is identical to the irrelevant condition for the opposite topic. This method of analysis simplifies comparisons with the pilot study results and allows for a more logical discussion of the effects of the fear arousal manipulation.

The results of the 2 x 2 ANOVA on risk scores from the risk assessment questionnaires, perceived vulnerability and fear arousal as a result of the fear and topic manipulations paralleled those in the pilot research. There was a significant main effect of fear condition on risk scores following the risk assessment questionnaire such that the average score from the fear arousal versions of the questionnaire was higher (mean = 6.97) than the average score from the no fear arousal versions (mean = 2.06;  $F(1, 202) = 342.273, p=.000$ ). There were also significant main effects of the fear manipulation on ratings of both perceived vulnerability and fear arousal. Subjects in the fear arousal condition felt more vulnerable (mean = 4.47) and reported more fear arousal (mean = 4.15) than subjects in the no fear condition (vulnerability mean = 3.39, fear arousal mean = 3.21;  $F(1, 202) = 32.47, p=.000$  and  $F(1, 202) = 23.29, p=.000$ , respectively). In addition, there was a significant main effect of topic on the dependent measure of fear arousal: independent of the fear arousal manipulation, the heart disease topic elicited more fear



overall (4.05) than the peptic ulcer topic (3.63;  $F(1, 202) = 5.46, p=.02$ ). There were no significant effects of topic on either risk assessment score ( $p=.27$ ) or perceived vulnerability ratings ( $p=.63$ ). There were no significant interactions.

The results of these analyses on fear arousal manipulations indicate that, as in the first pilot study, the manipulation of fear was successful. Subjects felt they were more likely to develop the health problem and were more afraid of the possibility of developing the health problem when they had received one of the fear arousal versions of the risk assessment questionnaire than when they received a no fear arousal version. Similar to the results of the first pilot study, subjects were more afraid of the possibility of developing heart disease than they were of developing peptic ulcers. As stated earlier, this is probably due to the difference in the severity of these two diseases.

Since the fear arousal manipulation really had three levels in the main study, additional 3 (fear arousal: relevant, irrelevant, and none) x 2 (topic: ulcers and heart disease) analyses of variance were conducted on the risk scores and ratings of perceived vulnerability and fear arousal. The main effects of the fear manipulation remained significant for all three of these variables (risk score  $F(2, 188) = 172.57, p=.000$ ; perceived vulnerability  $F(2, 188) = 16.40, p=.000$ ) and fear arousal ( $F(2, 188) = 11.44, p=.000$ ) but the main effect of topic was no longer significant ( $p=.66$ ). However, there was a marginally significant fear x topic interaction ( $F(2, 188) = 2.498, p=.09$ ) based on the fear arousal manipulation which was due to the differing levels of fear arousal resulting from the different risk assessment questionnaire topics. When considering the three levels of fear arousal for each topic, there was a higher level of irrelevant fear (mean = 4.38) than relevant fear (mean = 3.96) for the peptic ulcer risk assessment questionnaire while the opposite was true for the heart disease risk assessment questionnaire (relevant fear mean = 4.30; irrelevant fear mean = 3.94).

The 3 x 2 analysis of risk scores, perceptions of vulnerability, and fear arousal provide further evidence that the manipulation of fear was successful in this study. Fear arousal conditions did result in a greater experience of fear and vulnerability although this tendency was slightly greater for the heart disease manipulation than for peptic ulcers.

### Average Ratings of Attitudes and Intentions

The hypotheses that were predicted include comparisons between the strong and weak messages in each of the fear conditions. It was expected that relevant fear motivated subjects to attend to the quality of the persuasive messages. Therefore, subjects in the relevant fear condition would differentiate between these messages to a greater degree than subjects in either the irrelevant fear or no fear arousal conditions. In addition, it was hypothesized that irrelevant fear might have distracted subjects from attending to the quality of the persuasive message so that any differences between argument quality conditions would be greater in the no fear condition than the irrelevant fear condition. It was further predicted that for the minimal message conditions, the arousal of fear, either relevant or irrelevant, would serve as a cue for persuasion so that attitudes and intentions would be greater in both fear arousal conditions than in the no fear condition.

As all of the attitude and intention ratings were expected to have similar effects, ratings were averaged to form a composite attitude/intention measure. An examination of this composite attitude/intention measure indicates that the results did follow some of the predicted patterns (see figure 1 on page 51). The pattern of these means indicates that relevant fear did seem to serve a motivating function. Subjects who experienced the relevant fear arousal differentiated more between the strong and weak messages than subjects who did not experience fear arousal. This effect appears to be moderately large

for the peptic ulcer topic but is much smaller for the heart disease topic because subjects in the no fear arousal condition for the heart disease topic also differentiated between the strong and weak messages to a great extent.

Comparisons between the composite attitude and intention ratings between the irrelevant fear arousal conditions and the no fear arousal conditions reveal that irrelevant fear did not seem to serve as a distractor. Contrary to hypotheses, the differences between the strong and weak message ratings seem equivalent in the irrelevant fear arousal conditions and the no fear arousal conditions for the heart disease topic while for the ulcer topic the disparity between the ratings of strong and weak messages is greater in the irrelevant fear condition than the no fear condition. However, there is one piece of evidence that indicates that irrelevant fear arousal might have been distracting. In the strong heart disease message, irrelevant fear arousal resulted in less favorable evaluations of the message than either the relevant fear or no fear arousal conditions.

Based on this data, there was no real evidence for the peripheral cue hypothesis: that the mere arousal of fear might enhance persuasion within the minimal message conditions. For the peptic ulcer topic, the minimal message condition produced the same amount of persuasion whether relevant fear or no fear was aroused. In addition, the arousal of irrelevant fear was less effective in producing positive attitudes and intentions than no fear arousal. For the heart disease topic, there was a very slight tendency for relevant fear and irrelevant fear to enhance persuasion when compared to no fear arousal, but this was such a slight trend that it is not reliable.

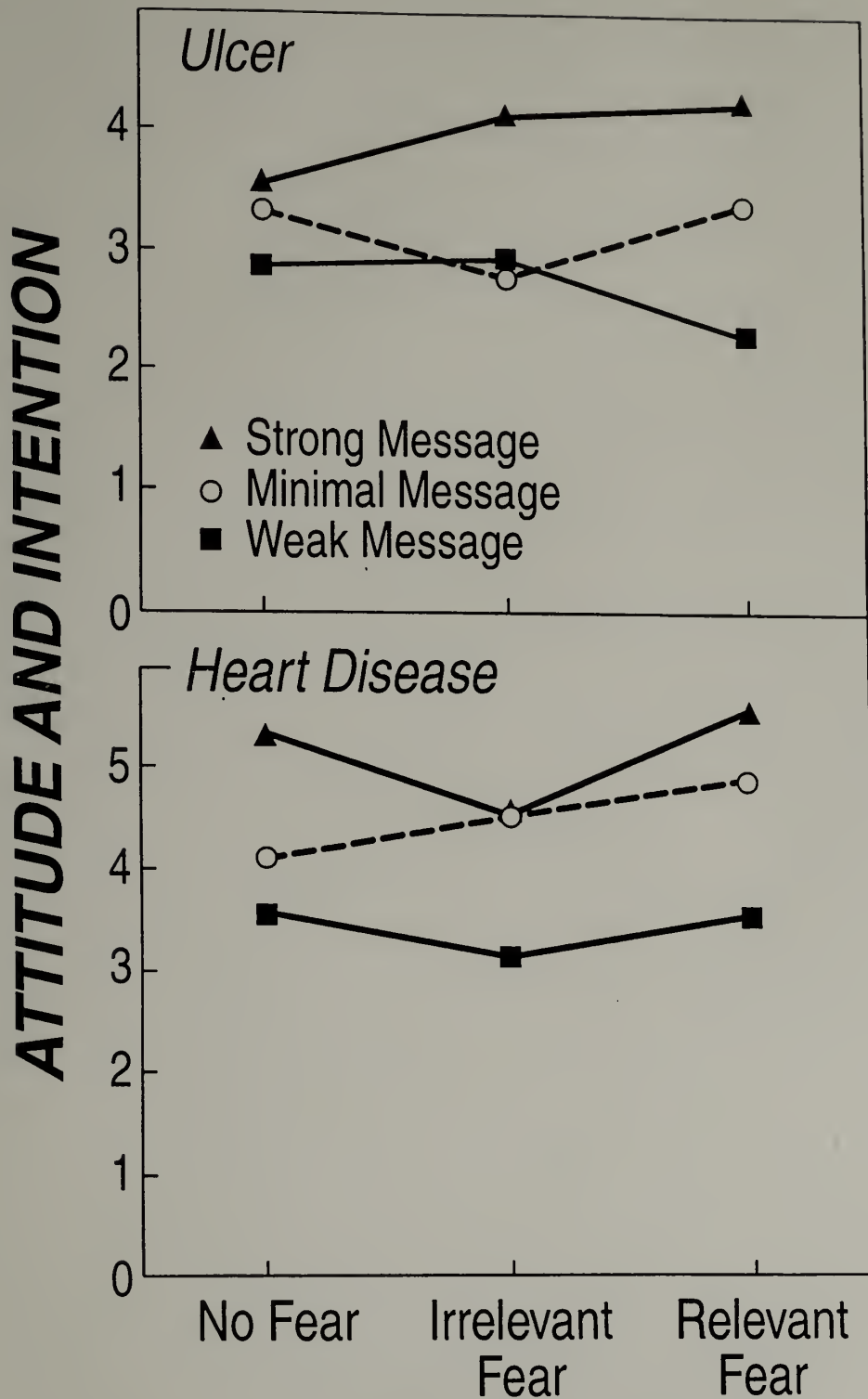


Fig 1. Average ratings across attitude and intention measures by fear condition, message quality and topic

## Significance Testing on Attitude and Intention Ratings

Each of the attitude and intention measures described earlier were submitted to separate 2 (topic: peptic ulcer, heart disease) x 3 (fear arousal: relevant, irrelevant, none) x 3 (message quality: strong, weak, minimal) analyses of variance. Additional 3 x 3 analyses were conducted on the averages of all measures across the two topics. All significant results will be described. However, the specific hypotheses in this study can only be tested using contrast analyses. These contrasts were computed on the average ratings of the dependent measures both for each topic separately and collapsed across topic<sup>4</sup>. The four dependent variables were highly correlated (correlations ranged from  $r = .60$  to  $r = .86$ ) so multivariate analyses were also conducted to assess patterns across all of the attitude and intention measures. The overall pattern of findings across all of the attitude and intention measures is shown in figure 1 (page 61) while the means and standard deviations for each of the variables are reported individually in tables 1 and 2 (pages 53 and 54).

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<sup>4</sup> All contrasts were tested against the average mean squared error variance only for those cells included in the contrast. In addition, there were 10 planned contrasts for each analysis. Although a strict interpretation of Bonferonni's adjustment would result in testing significance at  $\alpha = .005$ , the standard  $\alpha = .05$  has been used due to the fact that the planned contrasts were not independent. Using Bonferonni's adjustment in this case would result in a greater probability of Type II errors. In interpreting these effects, it should be noted that there is an increased probability of Type I errors as the results are reported here. A significance level between  $\alpha = .005$  and  $\alpha = .05$  would be more appropriate.



Table 1: Attitude Means and Standard Deviations Reported by Condition

		<i>Message Condition</i>			<i>Attitude</i>	
		<i>Strong</i>	<i>Weak</i>	<i>Minimal</i>		
<b>ULCER</b>	<i>Relevant</i>	3.92 ± 1.19	2.36 ± 1.35	3.14 ± 1.04	<i>Affective</i>	
		5.07 ± 1.04	3.10 ± 1.87	4.64 ± 1.40	<i>Evaluative</i>	
	<i>Irrelevant</i>	4.22 ± 1.03	3.29 ± 1.44	2.68 ± 1.13	<i>Affective</i>	
		5.32 ± 1.20	4.17 ± 1.43	3.49 ± 1.59	<i>Evaluative</i>	
	<i>No Fear</i>	4.02 ± 0.71	3.04 ± 0.47	3.26 ± 0.90	<i>Affective</i>	
		4.52 ± 1.40	3.56 ± 0.71	4.51 ± 0.93	<i>Evaluative</i>	
	<b>HEART DISEASE</b>	<i>Relevant</i>	5.92 ± 0.65	3.52 ± 1.15	5.00 ± 0.82	<i>Affective</i>
			5.63 ± 1.17	4.30 ± 1.49	4.89 ± 1.04	<i>Evaluative</i>
		<i>Irrelevant</i>	5.20 ± 0.94	3.64 ± 1.33	4.91 ± 1.20	<i>Affective</i>
5.21 ± 1.09			4.17 ± 0.97	4.93 ± 0.94	<i>Evaluative</i>	
<i>No Fear</i>		5.65 ± 0.60	4.58 ± 0.76	4.62 ± 0.71	<i>Affective</i>	
		5.58 ± 0.58	4.13 ± 0.94	4.62 ± 1.00	<i>Evaluative</i>	

Table 2: Intention Means and Standard Deviations Reported by Condition

		<i>Message Condition</i>			
		Strong	Weak	Minimal	<u>Intention</u>
<b>ULCER</b>	<i>Relevant</i>	3.85 ± 1.69	2.00 ± 1.50	2.85 ± 1.45	<i>Average</i>
		4.15 ± 2.34	1.83 ± 1.27	2.92 ± 2.11	<i>Overall</i>
	<i>Irrelevant</i>	3.39 ± 1.25	2.45 ± 1.41	2.46 ± 1.40	<i>Average</i>
		3.58 ± 2.19	1.92 ± 1.19	2.54 ± 2.26	<i>Overall</i>
	<i>No Fear</i>	2.92 ± 1.16	2.33 ± 1.23	3.06 ± 1.06	<i>Average</i>
		2.73 ± 1.90	2.58 ± 1.89	2.50 ± 1.32	<i>Overall</i>
<b>HEART DISEASE</b>	<i>Relevant</i>	5.12 ± 0.88	3.42 ± 1.31	4.67 ± 0.89	<i>Average</i>
		5.64 ± 1.20	3.00 ± 1.56	5.00 ± 2.13	<i>Overall</i>
	<i>Irrelevant</i>	3.58 ± 1.59	2.56 ± 1.41	3.91 ± 1.10	<i>Average</i>
		4.00 ± 2.68	2.18 ± 1.54	4.36 ± 1.69	<i>Overall</i>
	<i>No Fear</i>	4.70 ± 0.81	2.94 ± 1.25	3.56 ± 1.42	<i>Average</i>
		5.27 ± 1.00	2.55 ± 1.51	3.58 ± 1.68	<i>Overall</i>

## Main Effects

Message Quality. The analyses of main effects in the data provided additional evidence that message quality was manipulated successfully. The strong persuasive messages produced more favorable attitude ratings and greater behavioral intentions than the weak messages. The pattern was also consistent with the results from the second pilot study that the heart disease messages were rated more favorably than the peptic ulcer messages; the heart disease messages resulted in more favorable attitude ratings and greater behavioral intentions than the ulcer messages. The arousal of fear did not have an overall effect on the attitude measures but there was a pattern for relevant fear to produce greater intentions than both irrelevant fear and no fear arousal.

There was a significant main effect of message quality across all four of the dependent variables on the multivariate analysis of variance ( $F(3, 382) = 8.60, p = .000$ ) and this effect held on each of the four univariate tests (affective attitude  $F(2, 193) = 34.98, p = .000$ ; evaluative attitude  $F(2, 193) = 20.971, p = .000$ ; average intention  $F(2, 193) = 17.921, p = .000$ ; overall intention  $F(2, 193) = 18.91, p = .000$ ). In all cases, the strong messages resulted in more favorable ratings of attitudes and intentions than the weak messages, with the minimal message control conditions falling in between. This provides supporting evidence for the second pilot study and indicates that message quality was appropriately manipulated.

Message Topic. There were also significant main effects of message topic on the multivariate analysis ( $F(4, 190) = 33.47, p=.000$ ) and on all four of the univariate tests (affective attitude  $F(1, 193) = 110.59, p=.000$ ; evaluative attitude  $F(1, 193) = 11.39, p=.001$ ; average intention  $F(1, 193) = 31.87, p=.000$ ; overall intention  $F(1, 193) = 22.82, p=.000$ ). On all of these measures, the heart disease topic resulted in more favorable attitude ratings and higher behavioral intentions than the peptic ulcer topic. Again, this is consistent with the second pilot study which found that the heart disease topic messages were rated as being of better quality than the peptic ulcer messages.

Fear Arousal. Although there was a significant main effect of fear arousal in the multivariate analysis ( $F(8, 382) = 2.40, p=.02$ ) this was not significant on either of the univariate tests for the attitude measures (affective  $p=.31$ ; evaluative  $p=.82$ ). There was a significant main effect of fear arousal on the univariate test for average intention ( $F(2, 193) = 4.02, p=.02$ ) such that the irrelevant fear conditions produced the lowest intention ratings (mean = 3.03) while the relevant fear conditions resulted in the highest intention ratings (mean = 3.64; no fear mean = 3.24). In addition, the univariate main effect of fear arousal on the overall intention measure was marginally significant ( $F(2, 193) = 2.89, p=.06$ ). In this case, relevant fear arousal resulted in greater behavioral intentions (mean = 3.75) than both irrelevant fear arousal (mean = 3.06) and no fear arousal (mean = 3.19).

These results indicate that although fear arousal alone, with only a minimal message, did not influence attitudes, relevant fear arousal produced greater intentions to use the proposed products than either irrelevant fear arousal or the absence of fear arousal. This finding can be interpreted as providing support for the idea that the arousal of fear by itself can serve as a peripheral cue to enhance persuasion.



## Interaction Effects

Message Quality x Message Topic. There was evidence that the differences in the quality of the persuasive messages was slightly different for each of the message topics. There was a significant message quality x message topic interaction in the multivariate analysis ( $F(8, 382) = 1.89, p=.06$ ). This interaction was also significant on the univariate test of the affective attitude measure ( $F(2, 193) = 110.59, p=.000$ ). This interaction effect was due to the difference in attitude ratings between the heart disease and peptic ulcer messages. The difference in attitude ratings between these two topics was larger in the strong message and the minimal message condition while the messages were rated more similarly when they were weak messages. This interaction was not significant on the univariate test of the evaluative attitude measure ( $p=.89$ ) but was marginally significant on both of the univariate tests for the intention measures (average intention  $F(2, 193) = 2.245, p=.11$ ; overall intention  $F(2, 193) = 2.20, p=.11$ ). The pattern of means corresponding to this interaction is the same for all of the dependent variables. In all cases, the difference between attitude and intention ratings resulting from the heart disease and peptic ulcer messages is smallest in the weak message conditions and greater in both the minimal message condition and the strong message condition. This indicates that weak messages regardless of topic were not very persuasive while there was bigger difference in how persuasive the strong messages and the minimal messages were for each condition.

Fear Arousal x Message Quality. The effect that is most relevant for the hypotheses of the present study is the interaction between the level of fear arousal and the quality of the persuasive messages. However, since the two topics of the messages often resulted in



different ratings, the three way interaction between level of fear arousal, message quality, and topic are also relevant regarding the hypotheses. Specifically, it was predicted that if relevant fear served to motivate message processing, the difference between the strong and weak persuasive messages would be greater under relevant fear arousal than no fear arousal. In addition, if irrelevant fear distracted subjects from message processing the differences in attitude and intention ratings based on argument quality would be smaller under irrelevant fear arousal than no fear arousal.

The multivariate analysis did not reveal the expected fear arousal x message quality interaction although the effect occurred in the predicted direction ( $F(16, 772) = 1.39, p=.14$ ). In addition, the fear arousal x message quality x message topic interaction was in the predicted direction but was not significant ( $F(16, 772) = 1.37, p=.15$ ). However, the predicted fear arousal x message quality interaction was significant on the univariate test for the affective attitude measure ( $F(4, 193) = 2.06, p=.04$ ) although this effect is qualified by the 3 way interaction trend between fear arousal, message quality and message topic ( $F(4, 193) = 1.89, p=.11$ ). Additionally, this three way interaction was significant for the univariate test of the evaluative attitude measure ( $F(4, 193) = 2.43, p=.05$ ) and it occurred in the predicted direction for univariate test of the average intention measure ( $F(4, 193) = 5.33, p=.18$ ) although it was not significant for the overall intention measure ( $p=.31$ ).

The significant and marginally significant effects for the fear arousal x message quality x message topic interactions indicate that the pattern of the predicted fear arousal x message quality interaction was different for each of the two topics. As such, the planned contrast analyses further examining these interactions are reported separately for each topic.

The results for the peptic ulcer topic are as follows. On the two attitude measures, the planned contrast analyses showed that for all three levels of fear arousal considered

separately there was a main effect of message quality such that the strong messages produced more favorable attitudes than the weak messages (affective attitude: relevant fear,  $p < .0005$ , irrelevant fear,  $p < .0005$ , no fear,  $p < .001$ ; evaluative attitude: relevant fear,  $p < .0025$ , irrelevant fear,  $p < .025$ , no fear,  $p < .025$ ). In addition, as predicted, in the relevant fear condition the difference between attitude ratings for the strong and weak messages was greater in the relevant fear arousal condition than in the no fear arousal condition. However, while this was significant on the affective attitude ratings ( $p < .001$ ) it was only marginally significant on the evaluative attitude ratings ( $p < .1$ ). Additionally, the difference based on quality of the message was slightly greater in the relevant fear arousal condition than the irrelevant fear arousal for the affective attitude ( $p < .1$ ) but this effect did not approach significance for the evaluative attitude ( $p > .2$ ).

Contrary to the hypotheses, there were no significant differences on attitude ratings of the strong and weak messages when compared between the irrelevant fear arousal conditions and the no fear arousal conditions ( $p > .2$ ). This result indicates that the arousal of irrelevant fear did not serve to distract message recipients from evaluating the strong and weak messages.

This pattern of results provides evidence that, within the peptic ulcer condition, relevant fear served to motivate subjects to carefully attend to the quality of the persuasive messages so that their attitudes were based on the strength of the messages. Subjects in the relevant fear arousal conditions differentiated between strong and weak messages to a greater extent than subjects who were in the no fear arousal conditions. There was also some evidence that relevant fear arousal was more motivating than irrelevant fear arousal, although this was just a trend. This could be an indication that irrelevant fear arousal was somewhat distracting in comparison with relevant fear arousal. There was no evidence,

however, that irrelevant fear served to distract subjects from making a distinction between the strong and weak messages in comparison to the no fear arousal condition.

A similar pattern emerged in the analyses for the intention measures. For both intention measures there were significant main effects of message quality within each level of fear arousal, with one exception, such that the strong messages resulted in higher behavioral intentions than the weak messages (average intention: relevant fear,  $p < .005$ , irrelevant fear,  $p < .05$ ; overall intention: relevant fear,  $p < .0025$ , irrelevant fear,  $p < .0025$ , no fear,  $p < .025$ ). On the average intention measure, the difference between behavioral intentions for the strong and weak messages in the no fear arousal condition was only marginally significant ( $p < .1$ ).

As predicted, there was a significant interaction that demonstrated that the difference in overall intention ratings between the strong and weak messages was greater in the relevant fear arousal condition than the no fear arousal condition ( $p < .05$ ). The same pattern emerged on the average intention measure but was only marginally significant ( $p < .1$ ). These findings provide further support for the hypothesis that high relevant fear arousal would motivate subjects to differentiate between the strong and weak messages when compared to no fear arousal.

In addition, contrary to predictions, there was a tendency for the difference in overall intention ratings between the strong and weak message conditions to be greater under irrelevant fear arousal than no fear arousal ( $p < .1$ ) although this did not approach significance for the average intention ratings ( $p > .2$ ). There were also no significant differences between the intention ratings of the strong and weak messages in comparisons between the irrelevant fear arousal and no fear arousal conditions ( $p > .2$ ). This indicates that irrelevant fear, rather than distracting subjects, also served to motivate subjects to carefully process the persuasive messages and to evaluate them based on their quality.

However, the arousal of irrelevant fear did not have as strong a motivating effect as the arousal of relevant fear. There was no evidence to support the hypothesis that irrelevant fear would serve to distract subjects from attending to the persuasive messages.

Additional contrast analyses were performed to assess the predictions regarding the potential for fear to serve as a peripheral cue. It was hypothesized that if fear arousal served as a peripheral cue, there would be evidence that in the minimal message conditions, both of the fear arousal conditions (relevant fear and irrelevant fear) would result in more favorable attitude ratings and greater behavioral intentions as compared to the no fear arousal conditions. This hypothesis was not supported. The contrasts examining the effects of the fear arousal conditions in the no message control condition did not approach significance ( $p > .2$ ). There was no evidence on any of the attitude or intention measures for the peptic ulcer condition showing that either the high relevant fear arousal or the high irrelevant fear arousal enhanced persuasion over the no fear arousal condition in the absence of a persuasive message.

The results for the heart disease topic are as follows. In general, the pattern of results for the heart disease topic did not support the hypotheses. On all four dependent measures of attitudes and intentions, there were significant main effects of message quality for each level of fear arousal such that the strong messages had greater effects than the weak messages (affective attitude: relevant fear,  $p < .005$ , irrelevant fear,  $p < .05$ , no fear,  $p < .0005$ ; evaluative attitude: relevant fear,  $p < .01$ , irrelevant fear,  $p < .01$ , no fear  $p < .0005$ ; average intention: relevant fear,  $p < .0025$ , no fear,  $p < .0005$ ; overall intention: relevant fear,  $p < .0005$ , irrelevant fear,  $p < .05$ , and no fear,  $p < .0005$ ). The only exception was that the difference between the behavioral intentions resulting from the strong and weak messages for the average intention measure was only marginally significant ( $p < .1$ ).



Contrary to the hypotheses, there were no significant interactions between message quality and fear arousal on any of the dependent variables.

These results indicate that although the attitude and intention ratings for the heart disease topic were influenced by message quality, subjects exposed to the heart disease messages did not process the strong and weak messages differently based on the amount or type of fear aroused. In this case, there is no evidence that fear served either to motivate subjects to engage in careful message appraisal or that fear served to distract subjects from careful message appraisal.

As with the peptic ulcer topic condition, contrast analyses were computed to assess the predictions regarding fear as a peripheral cue. There were no significant differences on either of the two attitude measures showing that either level of fear arousal (relevant fear or irrelevant fear) enhanced persuasion when compared with no fear arousal in the minimal message control conditions. However, there was a significant main effect comparison on both intention measures between the fear arousal manipulation and the no fear arousal manipulation within the minimal message control groups (average intention,  $p < .05$ ; overall intention,  $p < .025$ ). Both of these comparisons indicated that the arousal of relevant fear resulted in greater behavioral intentions than not arousing fear in the absence of a detailed persuasive message, providing some support for the idea that relevant fear may have served as a heuristic or peripheral cue for the heart disease messages.

### Cognitive Elaboration Measures

In addition to attitude and intention ratings, subjects had listed the thoughts they had while reading the persuasive message. These were coded into categories of message favorable thoughts, counterarguments, and neutral statements which were combined into a



measure of message-relevant thoughts. Each of these categories was submitted to 2 x 3 x 3 analysis of variance as described above for the attitude and intention measures.

### Message Relevant Thoughts

Message relevant thoughts includes all thoughts related to the topic of the persuasive message, whether they were favorable, unfavorable or neutral. It was therefore unclear whether there would be any differences due to this variable in the analyses. The results regarding favorable and unfavorable thoughts would be more supportive of the hypotheses of the study. However, there were some significant effects of this variable. There was a significant main effect for message quality ( $F(2, 193) = 3.10, p=.047$ ) such that subjects receiving the weak messages generated more message related thoughts (mean = 3.44) than subjects receiving either the strong message (mean = 3.00) or minimal message (mean = 2.81). There was also a significant main effect for topic ( $F(1, 193) = 4.51, p = .04$ ) where the ulcer messages resulted in a greater number of message related thoughts (mean = 3.30) than the heart disease messages (mean = 2.84). In both of these main effects, fewer message relevant thoughts were generated in the conditions where subjects generally reported greater persuasion (the heart disease messages consistently resulted in more favorable attitudes and greater intentions than the ulcer messages and the strong messages consistently resulted in more favorable attitudes and greater intentions than the weak messages and the minimal messages).

## Favorable Thoughts

Counts of the number of favorable thoughts listed by subjects after reading the persuasive message were submitted to a 2 x 3 x 3 ANOVA. There was a significant main effect of message quality ( $F(2, 193) = 15.56, p = .000$ ) where the strong messages resulted in a greater number of favorable thoughts (mean = 1.28) than either the weak messages (mean = .47) or the minimal messages (mean = .46). In addition, there was a significant main effect of topic ( $F(1, 193) = 8.64, p = .004$ ); subjects listed more favorable thoughts after reading the heart disease messages (mean = .94) than the peptic ulcer messages (mean = .54). Neither of these main effects are surprising as they correspond to the attitude and intention ratings: strong messages had a greater impact than weak and minimal messages and the heart disease messages were more effective than the ulcer messages.

A fear arousal x message quality interaction was expected showing that relevant fear would motivate subjects to respond more favorably to the strong messages than the weak messages to a greater extent than when compared with the no fear condition. Similarly, it was expected that the arousal of irrelevant fear would distract subjects from responding with more favorable thoughts to the strong rather than the weak messages when compared with the no fear arousal condition. However, the predicted interactions on favorable thought listings were not significant.

## Counterarguments

Statements made against the persuasive messages were also submitted to a 2 x 3 x 3 ANOVA. It was predicted that subjects would make the greatest number of

counterarguments after reading a weak message and this was demonstrated in the pattern of results. There was a significant main effect of message quality ( $F(2, 193) = 35.253, p = .000$ ) where a larger number of counterarguments occurred after the weak messages (mean = 2.46) than after both the minimal messages (mean = 1.17) and the strong messages (mean = .67). In addition, as the heart disease messages were consistently rated as being of higher quality than the peptic ulcer messages, it was expected that there would be a greater amount of counterarguing after the peptic ulcer messages than the heart disease messages. There was a significant main effect of topic supporting this prediction ( $F(1, 193) = 12.31, p = .001$ ; heart disease mean = 1.10, peptic ulcer mean = 1.74). These results demonstrate that a greater extent of counterarguing took place after the messages that consistently resulted in lower attitude and intention ratings, specifically, the peptic ulcer messages and the weak quality messages.

It was also predicted that there would be a significant fear arousal x message quality interaction such that relevant fear would motivate counterarguments while irrelevant fear would serve to distract from counterarguments when these conditions were compared to the no fear arousal condition. This interaction was not significant ( $p = .22$ ).

However, there was a marginally significant contrast interaction between fear condition and message quality for the peptic ulcer topic ( $p < .1$ ). Specifically, the relevant fear condition resulted in a greater difference in counterarguing between the strong and weak messages than the no fear condition. The difference between counterarguments in response to the strong and weak messages in the irrelevant condition fell between the high relevant and no fear conditions but was not statistically different from either one. This provides some evidence that relevant fear did serve to motivate subjects to more critically evaluate the persuasive messages than no fear arousal. It also provides evidence that

irrelevant fear did not distract subjects from critically evaluating the persuasive messages. Instead, irrelevant fear may have had some motivating tendencies.

## CHAPTER 5

### DISCUSSION

The results of this study provided a fairly consistent pattern. First, the evidence demonstrated that the manipulations of fear arousal and message quality were successful. High levels of manipulated fear arousal resulted in greater feelings of both perceived vulnerability and fear in both the pilot research and the main study. In addition, strong messages were rated as being stronger, more persuasive, and more believable than the weak messages in the pilot study. In the main study, strong messages resulted in more favorable attitude and intention ratings, more favorable thoughts in response to the message, and fewer negative thoughts than the weak messages. There was also a very consistent pattern indicating that the heart disease messages were more persuasive than the peptic ulcer messages. The heart disease messages were rated more favorably than the ulcer messages in the pilot study and also resulted in more favorable attitude and intention ratings, more favorable thought listings, and fewer negative thought listings than the ulcer messages in the main study. Based on these results we can conclude that the manipulations of fear arousal and message quality were successful.

The results on the four measures of attitudes and intentions as well as the cognitive elaboration data also revealed a very consistent pattern. In the peptic ulcer messages, all of the dependent variables demonstrated a pattern of means such that the relevant fear arousal condition resulted in greater differences between the strong and weak persuasive messages when compared to the no fear arousal condition. Specifically, the differences between affective attitude ratings and overall intentions resulting from the strong and weak messages were statistically greater in the relevant fear arousal condition than in the no fear arousal condition. In addition, the same interaction on the evaluative attitude



ratings and the average intention ratings were marginally significant. There was also evidence that the amount of counterarguing that message recipients reported after the persuasive messages revealed the same pattern although it was only marginally significant.

The same pattern emerged for the comparison between the irrelevant fear arousal condition and the no fear arousal condition although the results were not as strong as the comparisons between relevant fear arousal and no fear arousal. The difference between overall intentions following the strong and weak messages was greater in the irrelevant fear arousal condition than the no fear arousal condition although this was only marginally significant. The other dependent variables showed the same pattern although as a non-significant trend.

The evidence relating to the possibility that fear might serve as a peripheral cue was also consistent within the peptic ulcer condition. However, it was contrary to hypotheses. There was no evidence on any of the dependent measures that fear arousal, whether relevant or irrelevant, resulted in greater attitude or intention ratings than no fear arousal with a minimal message.

The results for the heart disease messages were weaker than those for the peptic ulcer messages. Within the heart disease messages, the strong and weak messages were not processed differently based on fear arousal. The type and amount of fear aroused about heart disease did not induce message recipients to pay any more or less attention to the persuasive messages based on the quality of those messages regardless of how attention was measured. Message recipients did not differ on either affective attitudes, evaluative attitudes, overall intentions, average intentions, or counterarguments.

In terms of the hypothesis regarding the possibility that fear might serve as a peripheral cue, again, there was a different, but consistent, pattern within the heart disease messages. In this case, there was evidence that fear arousal, in the absence of a detailed persuasive

message, could serve to enhance persuasion in much the same way as a heuristic or a peripheral cue. Specifically, the relevant fear arousal condition resulted both in greater overall intentions and greater average intentions in the minimal message conditions than the no fear arousal condition. The same pattern emerged for the two attitude measures but the difference was not statistically significant.

The consistent pattern of results in this study provide partial support for some of the hypotheses. It had been hypothesized that the arousal of fear could have three possible effects on the process of persuasion. First, fear might serve to motivate message recipients to engage in extensive message processing so that persuasion would be enhanced if the message contained high quality arguments and persuasion would be inhibited if the message contained low quality arguments. Second, fear might serve to distract message recipients from engaging in extensive message processing so that persuasion would be unaffected by the quality of a persuasive message. Third, fear might serve as a peripheral cue or a heuristic, such that the mere arousal of fear, without a persuasive message, would lead to increased message acceptance when compared with no fear arousal.

In terms of the hypotheses regarding the specific manipulations in this study, it was expected that when fear was aroused in a manner that was relevant to the topic of a persuasive message it would serve the function of a motivator. In this event, it was expected that message recipients who were afraid of the illness discussed in the persuasive message would engage in increased message processing. This increased message processing would then lead message recipients to accept the persuasive messages based on quality. In other words, they would be more likely to accept the recommendations, measured by attitude and intention responses, if it was a high quality message than if it was a low quality message. It was further expected that when fear was aroused in a manner

that was irrelevant to the topic of a persuasive message it would serve the function of distracting message recipients from engaging in increased message processing. These message recipients would then refrain from extensive message processing and their attitude and intention responses would result in fewer differences between the strong and weak persuasive messages than message recipients who were not afraid. Finally, it was also expected that in the absence of a detailed persuasive message, both relevant fear and irrelevant fear might serve as a peripheral cue, inducing people to more favorably evaluate the described products than people who were not afraid.

The results of this study provide support for the idea that relevant fear served to motivate message recipients to engage in extensive message processing, but this support only occurred for the peptic ulcer topic. When fear about peptic ulcers was aroused prior to reading one of the peptic ulcer messages, message recipients reported a greater disparity between their attitudes and intentions in response to the strong and weak messages than people who did not experience the arousal of fear. This evidence for increased message processing is further corroborated by the results from the cognitive elaboration measure. Relevant fear arousal resulted in a greater difference in the number of counterarguments generated between the strong and weak messages than no fear arousal.

Although it was hypothesized that irrelevant fear would distract message recipients from engaging in extensive message processing, the evidence from this study indicates that this was not the case. Instead, there was some support for the idea that irrelevant fear had an effect similar to relevant fear. Specifically, it seemed that irrelevant fear also served to motivate message processing. However, the motivating effects of irrelevant fear tended to be much weaker than the motivating effects of relevant fear.

It was also hypothesized that the arousal of fear would serve as a peripheral cue, enhancing message acceptance over no fear conditions when message recipients did not engage in extensive message processing. This study was not really designed as an adequate test of this hypothesis as it had been expected that fear would tend to motivate or inhibit message processing. However, the results from the heart disease topic do provide some support for this hypothesis. In comparisons within the minimal message control conditions, the arousal of relevant fear did result in greater behavioral intentions than no fear arousal when extensive message processing was impossible due to the lack of any information provided in these messages. However, this finding was not as consistent as some of the other results because it was only significant on intentions, not on the attitude measures.

The effects described in this study, while statistically significant in some cases and marginally significant in other cases, must be interpreted with caution. Due to the large number of planned contrasts, the probability of Type I errors, rejecting the null hypothesis when it should not be rejected, is increased. It is difficult to determine what level of statistical significance would result in the standard 95% probability level due to the dependence of the planned contrasts. The Bonferonni adjustment, which is normally recommended as a means of determining the appropriate level of significance for planned contrasts, would result in an increased probability of Type II errors, failing to reject the null hypothesis when it should be rejected. It is believed that the consistency in the pattern of results described here demonstrates that even if these results do not reach the standard level of significance, they do indicate that the hypotheses have been supported.

It is possible that the failure of some of the results to achieve significance is due to a lack of power to detect the pattern of interactions that has been predicted. If this is so, increasing the number of subjects assessed in each of the conditions of the study will result



in a greater amount of confidence in the result patterns and significance levels. However, there is one other issue that should be mentioned. Although the pilot study results and the manipulation checks in the main study demonstrated that the manipulation of fear arousal was successful overall, there were some indications that a stronger manipulation of fear may be needed. The average ratings of fear arousal experienced by the subjects in this study only increased moderately from the no fear to the fear arousal conditions. Fear arousal was reported on a 7 point scale and the high fear arousal condition means did not increase very far above the mid-point of the scale. This may be an indication that a higher level of aroused fear would provide for greater differences in message processing. In addition, there were several subjects for whom the manipulation of high fear was not successful. These subjects were retained and included in all of the analyses reported here but as they reported not being afraid, their responses on the dependent measures may have served to dilute any significant effects.

Another concern with the design of this study which might have served to dilute the effects of fear arousal on message processing concerns the population of subjects. It is generally recognized that college students feel invulnerable to the possibility of their developing serious illnesses later in life. As such, it is possible that college students may not be the best population with which to examine the effects of arousing fear on processing a persuasive message regarding a health related topic. It would, therefore, be beneficial to use the methodology developed for this study on a different population of subjects who might feel more vulnerable or more afraid of developing particular health problems. However, the use of the risk assessment questionnaire to arouse fear is a somewhat simplistic method. A population of subjects who are more concerned about developing particular illnesses would probably be more aware of the risk factors associated with those illnesses. They would then be less likely to believe that they are at a



higher risk for developing a health problem because they have "ever" engaged in a risky activity. If a different subject population is used to verify these results it would be necessary to develop a better method to manipulate fear.

The hypothesis in this study regarding the possibility that fear might distract people from extensive message processing was not supported. This should not be taken as an indication that the arousal of irrelevant fear is not distracting. It is possible that the topic used for the arousal of irrelevant fear was not actually considered to be irrelevant to the message. Both topics were health problems that had some similar risk factors associated with them. For example, both topic versions of the risk assessment questionnaires stated that stress had been found to cause the described illness. Increasing a person's concern and fear regarding their health and the probability of developing an illness in the future, might be considered relevant to a persuasive topic regarding any illness whether it is the same or only slightly related. If this is the case, it is not surprising that the arousal of irrelevant fear had some motivating properties.

In addition, the design of this study may not have been adequate to test the hypothesis that irrelevant fear served as a distractor. If the results had shown, as hypothesized, that after the arousal of irrelevant fear, message recipients did not distinguish between the strong and weak quality messages in their attitude and intention ratings it would still have been impossible to conclude that this was due to the distracting property of irrelevant fear arousal. It might have been only that irrelevant fear arousal did not serve to motivate message recipients to carefully process the contents of the persuasive message.

Although there were some issues in this study that could be alleviated in future research on this topic, this research did accomplish many of the goals it had set out. First, this study introduced a new methodology for manipulating fear arousal so that it remains separate from any persuasive message manipulations. Previous research on the

relationship between fear and persuasion often confounded the manipulation of fear with the information contained in the persuasive message. As such, the actual content of the persuasive messages differed drastically between different levels of fear arousal manipulations. The technique of manipulating fear arousal within the content of the persuasive message has led to a great deal of confusion in interpreting the results of these empirical studies.

The present study successfully manipulated fear without making any changes to either the content of the persuasive messages or to the situation surrounding the persuasive message such as the credibility of the source of the message or using different audiovisual accompaniments to the message. This represents a good first step in developing new methodologies to continue to investigate the relationship between fear and persuasion without the problem of confounding variables.

In addition, this study pointed out that it is possible to manipulate fear and assess that manipulation without arousing other negative emotions such as guilt or disgust. The method used to manipulate fear in this study was clearly successful in arousing the emotional response of fear as well as perceptions of vulnerability that lead to the experience of fear without using material that arouses physical nausea or disgust or any of the other emotional responses that have been confounded with fear arousal in previous investigations of this topic.

Another goal that was accomplished in this study is that it has demonstrated that hypothesizing about the possible effects of incorporating fear into the process of persuasion as delineated by the dual-process models can lead to some valuable insights into the relationship between fear and persuasion. The consistent pattern of results provides evidence that the hypothesized effects of fear in this context are possible and valid. Most importantly, this study demonstrated that the effects of fear on persuasion

may be moderated by the quality of the persuasive message. This finding confirms the importance of manipulating, or at least assessing, the quality of a persuasive message when investigating the impact of fear on persuasion. In addition, this research study provides some information about promising directions for future research to further investigate these hypotheses.

There are several avenues for future research that need to be explored. First, the number of subjects participating in this study should be increased and the data re-analyzed. This is currently being accomplished. Second, a separate population of subjects should be investigated to avoid the problem of instilling perceptions of vulnerability in young people who generally feel that they will not develop serious health problems. Third, different methods of manipulating fear arousal need to be explored. It would still be beneficial to develop methods of manipulating fear that can be accomplished outside of a persuasive message manipulation to avoid confounding details of the persuasive message with the arousal of fear. When developing new ways of manipulating fear arousal, the amount of fear that is aroused should be considered to ensure that sufficiently high levels of fear are generated. A related issue is that the arousal of irrelevant fear should clearly be irrelevant to the topic of the persuasive message. If the relevant fear arousal and the topic of the persuasive message deal with a potential health threat as in this study, the irrelevant fear arousal should be the result of a manipulation that does not deal with possible illnesses. Sigall & Helmreich's (1969) method of having blood-sampling paraphernalia in the room or assessing the evaluation of a persuasive message just prior to experiencing an unrelated frightening event are a few possibilities (Helmreich, Kuiken, & Collins, 1968).

There are also research questions that derive from the theoretical position outlined in this paper that could not be resolved by this study alone. For example, the possible effects of fear arousal as a peripheral cue or heuristic are still unclear. Further theory and study

of this issue should be conducted. In addition, it is possible that different levels of fear arousal would have a different impact on persuasive message processing. It is likely that extremely high levels of fear arousal would distract message recipients from attentive processing of a persuasive message while moderate levels of fear arousal would motivate attentive processing. Research on this question may be difficult or unethical to conduct.

Another avenue for future research involves the question of whether fear appeals might be differentially successful based on personality characteristics. Fear-based persuasive appeals might lead to more extensive message processing for some people but not for others. One possibility that is currently being investigated relates to Epstein's (1985) distinction between rational and experiential modes of thinking. It is believed that people who tend to rely on a more rational or logical mode of thinking would be less motivated by a fear arousing persuasive appeal while people who rely on experiential modes of thinking would be more motivated by the emotional context of a fear appeal. Another relevant personality characteristic is trait anxiety. If extremely high levels of fear arousal is distracting to message processing, it is possible that a moderately arousing fear appeal would greatly interfere with message processing only for people who constantly experience a general state of anxiety. In effect, the manipulation of moderate levels of fear might be experienced as a high state of fear arousal when combined with a general state of anxiety. This might be one method of testing whether high levels of fear are distracting.

Each of these possible avenues for future research would lead to a greater understanding of the process by which fear has an impact on persuasion. The current study represents a first step towards increasing our understanding of how and why fear-based persuasive appeals work and it provides a means for attempting to reconcile the conflicting results of previous work on the relationship between fear and persuasion. It is hoped that the theoretical analysis of how the dual-process models of persuasion can be

used to shed light on the complexities of the fear-persuasion relationship will lead to a number of empirical studies and theoretical works that enhance our knowledge of the effect of fear on persuasion.



## APPENDIX A

### RISK ASSESSMENT QUESTIONNAIRES

Each risk assessment questionnaire began with one of the two cover pages containing a description of each of the two illnesses: heart disease and peptic ulcers. The second page of the questionnaire contained the instructions and questions and the scoring scale. There were four versions of the second page of the risk assessment questionnaire. The third page of each questionnaire contained instructions requesting subjects to imagine and list either the advantages of not developing the relevant disease (no risk/fear version) or the disadvantages of developing the disease (high risk/fear version).

The actual questionnaires are not reproduced in this appendix, but the descriptions of the disease used and the questions from each version of the risk assessment questionnaires are listed.

#### Description for Peptic Ulcer Questionnaires

A peptic ulcer is a pitting of a mucous or skin surface in the gastrointestinal tract caused by an erosion or disintegration of the tissues. Ulcers are relatively common and are thought to occur in 80% of the population in developed countries like the United States. In the past, ulcers have been primarily an older person's disease. However, ulcers are becoming more likely to develop in younger people at an alarming rate. Currently, approximately 20% of college-aged people are at a high risk of developing ulcers in the next 5 years and this percentage is rising.

The predominant symptom of a peptic ulcer is intense pain but the erosions in the gastrointestinal tract can penetrate the entire wall of the stomach, leading to hemorrhage and possible death. There is medical evidence that there are physiological and hereditary

causes of ulcers but a person's lifestyle and behaviors are considered to be important determinants of whether or not ulcers develop. If you become afflicted with peptic ulcers it would drastically change your way of life; you would have to take daily medication, carefully watch everything you eat and drink, and change your lifestyle to avoid stress.

### Description for Heart Disease Questionnaires

Coronary heart disease, which accounts for the highest incidence of all heart disease, is due to the obstruction of adequate blood flow through the coronary arteries. Although heart disease is primarily considered an older person's disease, it is increasingly more likely to develop in younger people. Currently, approximately 20% of college-aged people will be diagnosed with early heart disease by the time they are in their forties and this percentage is rising. Heart disease manifests itself by chest discomfort during exertion with the most severe consequence being a heart attack.

Although there are physiological and hereditary causes of heart disease, a person's lifestyle and behavior are more important determinants of whether or not early heart disease develops. In fact, medical research has determined that many of the behaviors people engage in when they are in their teens and early twenties are important causal agents in determining whether they will develop early heart disease. Early heart disease is a very serious, life-threatening disease that drastically interferes with a person's lifestyle. If you develop heart disease you would have to take daily medication, carefully watch everything you eat and drink, and change your lifestyle to avoid stress and exertion.

### Questions for Peptic Ulcer Questionnaires<sup>5</sup>

1. Eating spicy food causes ulcers. Do you ever (always) eat spicy foods?
2. Eating acidic foods such as certain fruits and vegetables (tomato products, citrus fruits, eggplant, and peppers) causes ulcers to develop. Do you ever (always) eat or drink tomato products or other acidic foods?
3. Refined sugar has been found to cause ulcers. Do you ever (always) feel like you have eaten too many sweets, cakes, or candy?
4. The typical American diet is composed of too much animal protein which has been found to cause ulcers. Do you ever (always) eat high protein animal products such as meat, chicken, fish, eggs or dairy products?
5. Stress and tension increase the development of ulcers. Do you ever (always) feel so severely stressed or tense that you cannot function effectively?
6. Having bad sleeping habits causes ulcers. Do you ever (always) stay awake later than 3 a.m.?
7. The use of analgesics such as aspirin, ibuprofen, and acetaminophen have been found to cause the development of ulcers. Do you ever (always) take analgesics when you experience any pain such as a headache or muscle ache?
8. Drinking alcohol significantly increases the danger of getting ulcers. Do you ever (always) drink alcoholic beverages?
9. Drinking caffeinated beverages increases the danger of getting ulcers. Do you ever (always) feel like you have had too many caffeinated beverages such as coffee or cola drinks?

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<sup>5</sup> Questions for both the high risk/fear versions and low risk/fear versions only differ in the use of the words "always" and "ever." All questions on each of the four versions of the risk assessment questionnaires were answered by checking one of two boxes labelled "yes" and "no".

10. High amounts of salt increase a person's risk of developing ulcers. Do you ever (always) eat high salt foods such as frozen dinners, Chinese food, or fast food?

### Questions for Heart Disease Questionnaires

1. Drinking caffeinated beverages causes the development of early heart disease. Do you ever (always) feel like you have had too many caffeinated beverages such as coffee or cola drinks?
2. Stress and tension have been directly linked to the development of early heart disease. Do you ever (always) feel so severely stressed or tense that you cannot function effectively?
3. Overeating is one of the factors that causes early heart disease. Do you ever (always) overeat until you feel completely overstuffed?
4. The typical American diet is composed of too much animal protein which causes early heart disease. Do you ever (always) eat high protein animal products such as meat, chicken, fish, or eggs?
5. Eating too much dietary fat causes early heart disease. Do you ever (always) eat foods high in dietary fat such as chips, candy, pizza, snack foods, or fast food?
6. Dairy products have been found to cause heart disease. Do you ever (always) drink milk or eat dairy products such as cheese or ice cream?
7. High amounts of salt increase a person's risk of developing early heart disease. Do you ever (always) eat high salt foods such as lunch meats, frozen dinners, Chinese food, or fast food?
8. People who don't eat enough fruits and vegetables are much more likely to develop early heart disease. Do you always (ever) eat at least 5 or more servings of different fruits and vegetables?

9. People who don't eat enough whole grain products are much more likely to develop early heart disease. Do you always (ever) eat at least 7 or more servings of whole grain products?
10. Not engaging in enough vigorous and regular exercise has been found to cause early heart disease to develop. Do you always (ever) engage in vigorous aerobic exercise at least 5 times a week for 40 minutes at a time?



APPENDIX B  
PERSUASIVE MESSAGES

This appendix contains the four persuasive messages subjects received as the manipulation of message quality. There are two messages, one strong and one weak, for each topic.

Peptic Ulcer Topic: Strong Message

A peptic ulcer is a very painful, although rarely life-threatening, disease that affects millions of Americans. Peptic ulcers develop as a result of a combination of factors including stress, stomach acid production, and type of foods ingested. Peptic ulcers occur when lesions develop on the surface lining of the stomach or intestines. Traditionally, peptic ulcers have been treated with surgery or drugs. However, one company, Medivax Corporation, is working on a new product using non-invasive techniques to prevent peptic ulcers from developing in the first place so that radical surgical or drug treatments will be unnecessary. The medical research community has uncovered scientific evidence that indicates that this product can dramatically reduce the incidence of peptic ulcer development in people who are at risk for ulcers.

Sources at Medivax Corp. inform the *Advisor* that their new product, tentatively named the "Metabolic Abdominizer," is in an advanced stage of development and testing. The product has been approved by the Federal Drug Administration and will be test-marketed in the summer of 1997. It is designed to be used by people who are at risk for developing peptic ulcers.

The Metabolic Abdominizer consists of a band of cotton-covered, battery-operated electrodes that is worn around the abdomen while eating or experiencing stressful events.

The Abdominizer gently stimulates the diaphragm, stomach, and abdominal region, elevating metabolic processes that prevent peptic ulcer development. Dr. W. Reinet, the lead researcher on this project, informed the *Advisor* that the Metabolic Abdominizer increases production of certain hormones crucial to the body's ability to repair and prevent internal damage, aids in the digestive process, and controls stress reactions in the sympathetic nervous system.

The most important hormone stimulated by the Metabolic Abdominizer is oxytocassin which is crucial for preventing and repairing damage to cells and internal body organs. Oxytocassin present in the abdominal cavity repairs damage to the stomach lining and intestines that may develop into a peptic ulcer. Most people already produce oxytocassin but only in limited quantities that are not sufficient to deal with the extent of the abdominal stressors people face today (such as increased consumption of caffeine and acidic food, as well as daily life stress and tension). In addition to stimulating the production of oxytocassin, the metabolic abdominizer enhances blood flow and, therefore, the flow of hormones to the stomach and intestines. This directs oxytocassin to the abdominal region where it is most needed to prevent the development of peptic ulcers.

The Metabolic Abdominizer also aids digestion by stimulating the gall bladder to produce increased amounts of the enzymes necessary for digestion. As a result, food stays in the stomach and intestines for shorter time periods which has three benefits in terms of peptic ulcer formation. First, ulcer-causing food agents have less time to cause damage. Second, less stomach acid is needed to digest food so the production of stomach acid, which contributes to peptic ulcer development, decreases. Third, the extra digestive enzymes result in enhanced absorption of vitamins and minerals even though food is digested faster. The absorption of certain vitamins and minerals, specifically vitamins A and E, increases the body's ability to promote new cell growth, strengthens internal organs such as the stomach and intestines and thereby prevents peptic ulcers.

In addition to stimulating digestion and metabolic processes, the abdominizer causes the stomach and abdominal muscles to relax. Since stress is one of the leading causes of peptic ulcers, being relaxed and stress-free in the abdominal region while eating or at other stressful times reduces the likelihood of the development of peptic ulcers.

According to Medivax, the Metabolic Abdominizer will be an important tool in the fight against peptic ulcers. It is comfortable to wear either under or over clothing, and easy to take on and off before and after meals. Other people will not even be aware that you are wearing it. Many insurance companies have already agreed to cover the cost of the Abdominizer for their clients who are at risk for peptic ulcers.

#### Peptic Ulcer Topic: Weak Message

A peptic ulcer is a very painful, although rarely life-threatening, disease that affects millions of Americans. Peptic ulcers develop as a result of a combination of factors including stress, stomach acid productions, and type of foods ingested. Peptic ulcers occur when lesions develop on the surface lining of the stomach or intestines.

Traditionally, peptic ulcers have been treated with surgery or drugs. However, one company, Medivax Corporation, is working on a new product using non-invasive techniques to prevent peptic ulcers from developing in the first place so that radical surgical or drug treatments will be unnecessary. Although Medivax executives believe their new product will reduce peptic ulcer development, the medical community has doubts about how effective the product will be.

Sources at Medivax Corp. inform the *Advisor* that their new product, tentatively named the "Metabolic Abdominizer," is in an initial stage of development and testing. It has not yet been approved by the Federal Drug Administration. However, the company is hoping to test-market the product in the summer of 1997. It is hoped that the product

may be of some use for people who are at risk to develop peptic ulcers. The Abdominizer idea arose in response to the inability of medical research to produce drugs that reduce peptic ulcer development. Although they have been unable to reach any strong conclusions about what may or may not inhibit peptic ulcer development, Medivax's research team feel they have a product that is worth considering.

The Metabolic Abdominizer is a band of cotton-covered, battery-operated electrodes worn around the abdomen while eating or experiencing stressful events. The Abdominizer administers mild electric shocks to the abdominal area, distracting people from their meals and daily stress. The shocks also increase the wearer's sense of body-awareness and stimulate the production of hormones that reduce the sensation of pain.

Dr. W. Reinet, the lead researcher on this project, said that the most important effect of the Metabolic Abdominizer is to serve as a distractor. Peptic ulcers develop when people experience stress or consume foods that cause damage to the stomach and intestines. The Abdominizer causes people to focus attention on their stomach and distracts them from experiencing stress. Additionally, people get distracted from the foods they are eating so they are less likely to eat foods that damage their stomach and intestines such as acidic foods and caffeine.

The Metabolic Abdominizer also promotes body awareness. People wearing it become very aware of the size and shape of their body, especially their stomach. This increases concern about weight and health. People who are worried about their health and weight will avoid unhealthy, risky foods that cause ulcers.

In addition, the Metabolic Abdominizer increases the production of the hormone beta endorphin. Beta endorphins have an effect similar to morphine; they mask any pain or discomfort. As a result, people will not experience minor stomach pain that may indicate the early development of an ulcer. The presence of beta endorphins in the abdominal region stimulated by the Abdominizer serves to camouflage the lesions on the stomach and



intestines due to ulcer-causing agents. People who produce excess amounts of beta endorphins will be less likely to realize at an early stage that they have peptic ulcers and they will be able to go about their daily lives comparatively "ulcer-free". Medical researchers are concerned about this aspect of the Abdominizer because it may interfere with early detection and treatment of ulcers before they become a serious medical problem. Most people already produce beta endorphins but only in limited quantities that are not sufficient to deal with the extent of the abdominal stressors people face today (such as increases in consumption of caffeine and acidic foods as well as daily life stresses). In addition to stimulating beta endorphin production, the Abdominizer enhances blood flow and therefore the flow of hormones to the stomach and intestinal area. Beta endorphins are then directed to the abdominal region where they are most needed to camouflage ulcer pain.

According to the development team, the Metabolic Abdominizer will be attractively styled to suit contemporary tastes and will come in a variety of colors to match different outfits. It will be comfortable, although slightly bulky, to wear.

### Heart Disease Topic: Strong Message

Heart disease is currently the third leading cause of death among adults in the United States. It is one of the most serious health problems facing our nation. Heart disease occurs when blood has trouble traveling through the veins and arteries leading to and from the heart due to obstructions or arteriosclerosis (hardening of the arteries). Although the most serious effect of heart disease is a heart attack and death, heart disease can be managed and even prevented or reversed by a variety of surgical, medical, and behavioral techniques. In fact, one company, Medivax Corporation, is working on a new product to alleviate heart disease using non-invasive techniques. The medical research community



has scientific evidence that indicates this product can dramatically improve existing heart disease and can even prevent heart disease from developing in people who are at risk for heart problems.

Sources at Medivax Corp. inform the *Advisor* that their new product, tentatively named the "Meditative Induction Filter," is in an advanced stage of development. The product has been approved by the Federal Drug Administration and is scheduled to be test-marketed in the spring of 1997. In extensive research studies, the MIF has been shown to help people achieve a meditative state that significantly increases the functioning of the immune system and decreases a person's risk for a variety of cardiovascular illnesses including heart disease. Medical researchers have discovered that meditating produces a number of health benefits that reduce the likelihood of developing heart disease. These health benefits include increasing the functioning of the immune system and helping people deal more effectively with stress. Many people, however, have trouble meditating, both because it takes time and effort to learn how to achieve a meditative state and because many external noises and distractions prevent people from effectively meditating. The MIF has been designed to mask external distractions and to help people learn how to meditate using biofeedback techniques.

The *Advisor* has learned that the MIF consists of a set of headphones with several embedded computer chips. A sound chip filters out noise in the environment by analyzing the frequencies of incoming sound waves. It then generates symmetrical but opposite waves that cancel the incoming sounds. As a result, outside noise that interferes with a person's ability to achieve a meditative state can be easily controlled. This is vastly superior to mechanical ear plugs because the earphones can be adjusted to virtually eliminate any sounds.

In an interview, Dr. William Reinet, the lead researcher on this project, indicated that there are a variety of physiological benefits of reaching a meditative state using the MIF.

One major benefit is that meditation with the MIF lowers blood pressure and increases the number and effectiveness of white blood cells in the immune system. High blood pressure and arterial blockage are the major causes of heart disease. The lowered blood pressure achieved during meditation lasts for several days after each meditative session and drastically reduces the likelihood of a cardiac incident. Meditation guided by the MIF has been shown to dramatically strengthen and boost the immune system, aiding in the prevention of heart disease.

Another beneficial effect of meditation is that it serves to significantly reduce stress and increase feelings of well-being and optimism. Stress has been directly linked to heart disease. Any technique that a person can use to decrease the harmful effects of stress in their lives will result in a reduction of heart disease risk. People who meditate show significantly lower levels of blood lactate, a chemical that is linked both to stress and the hardening of arteries. Meditation with the MIF has been shown to lower blood lactate 75% faster than meditation without the MIF.

Psychological research has demonstrated that the strong sense of self-worth, optimism, and enhanced self-esteem that result from reaching a meditative state can greatly reduce one's chances of becoming ill. Studies have shown that people with high self esteem and optimism have drastically reduced incidence of hypertension, stroke, and heart disease.

According to medical experts, the Meditative Induction Filter will be an important tool in the fight against heart disease. The earphones will be attractively styled, comfortable to wear, and easy to use. They will fold up to fit into a small case so that they can be carried and used in a variety of locations. Many insurance companies have already agreed to cover the cost of the MIF for their clients who have heart disease and are endorsing the product for people in high risk groups as a worthwhile preventive measure.

## Heart Disease Topic: Weak Message

Heart disease is currently the third leading cause of death among adults in the United States. It is one of the most serious health problems facing our nation. Heart disease occurs when blood has trouble traveling through the veins and arteries leading to and from the heart due to obstructions or arteriosclerosis (hardening of the arteries). Although the most serious effect of heart disease is a heart attack and death, heart disease can be managed and even prevented or reversed by a variety of surgical, medical, and behavioral techniques. In fact, one company, Medivax Corporation, is working on a new product to alleviate heart disease using non-invasive techniques. Although company executives believe their new product can aid sufferers of heart disease, the medical community has doubts about how effective the product will be.

Sources at Medivax Corp. inform the *Advisor* that their new product, tentatively named the "Meditative Induction Filter," is in an initial stage of development. It has not yet been approved by the Federal Drug Administration, however, the company is hoping to test-market the product in the spring of 1997.

Medical researchers have long been searching for preventive actions to decrease a person's risk of heart disease and cardiovascular illness. One technique that has been virtually ignored by the traditional medical community is meditation. Medical research has failed to demonstrate any relationship between meditation and lower incidence of heart disease. In spite of the lack of research evidence that supports the beneficial effects of meditating, some health gurus believe that meditation can decrease the risk of heart disease. However, many people have trouble meditating both because it is time-consuming and difficult to learn how to meditate and because of external distractions that make achieving a meditative state difficult. The MIF has been designed to help people reach a meditative state that is thought to reduce a person's risk for heart disease by

minimizing external distractions by drowning them out with the extremely loud, random noises it emits.

The *Advisor* has learned that the MIF consists of a set of headphones with several embedded computer sound chips. The sound chip interferes with noise in the environment by producing a loud sound of its own. Users of the MIF will be able to choose among different settings to regulate the sound that is generated by the chip. These choices will consist of various random and unpredictable noise patterns such as buzzing, ringing, or traffic noises. The intensity of the sound can be set at different levels for each ear. It is hoped that outside noise and distractions that often interfere with a person's ability to achieve a meditative state can be ignored if a person is listening to the noise generated by the earphones. It is possible, however, for the device to be annoying to some people because of the loud noises it emits but it is hoped that it won't interfere with meditating and that instead, it will help meditation. The MIF is expected to work almost as well as mechanical ear plugs, but it can be switched on or off. In addition to the sound masking, the MIF contains a brain wave sensor that registers alpha wave patterns which are indicative of the meditative state. The sensor will beep loudly to indicate to the user when their meditative state has been reached. Although this may interfere with the meditation sequence, people can learn to recognize when they have achieved the most beneficial meditative state.

In an interview, Dr. William Reinet, the lead researcher on this project, indicated that there may be some physiological benefits of reaching a meditative state, although these benefits would be the same regardless of whether the person uses the MIF or other meditation techniques. One conceivable benefit is that meditation may temporarily lower blood pressure. High blood pressure is one of the major causes of heart disease. The lowered blood pressure achieved during meditation means that one might be less likely to experience cardiac trouble while meditating, although medical experts warn that any



beneficial effects will not last during a normal state of consciousness. As a result, cardiac risk will remain high during non-meditating periods.

Dr. Reinet also mentioned that another possible effect of meditation is that it serves to increase false feelings of euphoria and optimism. People who have reached a meditative state report a feeling of invulnerability. They believe that nothing can possibly harm them, including heart disease and arteriosclerosis. Some medical professionals have expressed concern about this aspect of meditation because people will be less likely to worry about the state of their health and will not engage in other cardiac risk-avoiding activities like exercising and eating low fat, low cholesterol diets.

According to the development team, the Meditative Induction Filter will be comfortable, although it is large and slightly heavy to wear. The earphones will fold up to fit into a small case weighing 8-10 pounds so that they can be carried and used in a variety of locations.



## APPENDIX C

### MINIMAL MESSAGE CONTROL GROUP MATERIALS

Subjects in the minimal message control conditions received shorter and less detailed messages about the products described in the persuasive messages. Since these were fictitious products, subjects would have been unable to report their attitudes and intentions without at least a brief description of the intended purpose of these products.

#### Peptic Ulcer Topic: Minimal Message

A peptic ulcer is a very painful, although rarely life-threatening, disease that affects millions of Americans. Peptic ulcers develop as a result of a combination of factors including stress, stomach acid production, and type of foods ingested. Peptic ulcers occur when lesions develop on the surface lining of the stomach or intestines. Traditionally, peptic ulcers have been treated with surgery or drugs. However, one company, Medivax Corporation, is working on a new product using non-invasive techniques to prevent peptic ulcers from developing in the first place so that radical surgical or drug treatments will be unnecessary. The new product, tentatively named the Metabolic Abdominizer, consists of a band of cotton-covered, battery-operated electrodes worn around the abdomen while eating or experiencing stressful events. The effectiveness of this product has not yet been evaluated.

#### Heart Disease Topic: Minimal Message

Heart disease is currently the third leading cause of death among adults in the United States. It is one of the most serious health problems facing our nation. Heart disease

occurs when blood has trouble traveling through the veins and arteries leading to and from the heart due to obstructions or arteriosclerosis (hardening of the arteries). Although the most serious effect of heart disease is a heart attack and death, heart disease can be managed and even prevented or reversed by a variety of surgical, medical, and behavioral techniques. In fact, one company, Medivax Corporation, is working on a new product to alleviate heart disease using non-invasive techniques. The new product, tentatively named the Meditative Induction Filter consists of a set of headphones with several embedded computer chips. The filter is designed to help people achieve a meditative state that is thought to help reduce a person's risk for heart disease. The effectiveness of this product has not yet been evaluated.

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