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# Increasing the Persuasiveness of Fear Appeals: The Effect of Arousal and Elaboration

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We investigate the conditions under which messages that prompt low and high levels of fear are likely to be effective. Our premise is that when a low level of fear is ineffective, it is because there is insufficient elaboration of the harmful consequences of engaging in the destructive behavior. By contrast, when appeals arousing high levels of fear are ineffective, it is because too much elaboration on the harmful consequences interferes with processing of the recommended change in behavior. We find support for these expectations in the context of a communication advocating that people stop smoking. The elaboration-enhancing interventions used, self-reference and imagery processing, increased the persuasiveness of a low-fear appeal by prompting elaboration on the harmful consequences of smoking, whereas the use of two elaboration-suppressing interventions, reference to others and objective processing, increased the persuasiveness of a high-fear appeal by decreasing the extent to which consumers deny harmful consequences.

What is the effect of fear arousal on attitude change? Do scare tactics enhance or inhibit message persuasiveness? Despite more than 40 years of research on this issue, an unequivocal answer is not possible. In some instances, fear arousal prompts a decrease in persuasion (Hovland, Janis, and Kelley 1953); in others, fear arousal enhances persuasion (King and Reid 1990) or results in an increase and then a decrease in persuasion (Janis 1967; Miller 1951). Furthermore, as Eagly and Chaiken (1993) noted, there is no compelling account of when and why these outcomes occur.

As a starting point for gaining insight about how fear arousal affects persuasion, consider the following message, which is characteristic of those used in investigations of the effect of fear.

Drinking and driving is dangerous to your health. You can be paralyzed instantaneously. All it takes is one sudden lurch forward and a quick snapping back of the upper torso to sever your spinal cord.

You can stop drinking and driving in just three easy steps: (1) designate a driver before you start out, (2) hand over the keys to the designated driver, and (3) include the designated driver in the festivities. Designated drivers can have as much fun as the rest of the group.

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Two distinct functions of this message can be discerned. One is to state the problem by presenting information about the harmful consequences of the behavior. The second function is to offer a solution comprised of recommended actions that one might take to avoid the negative consequences (Hovland et al. 1953). The persuasive impact of such fear-evoking messages is typically assessed by the level of elaboration and agreement with the advocated solution.

Following this approach, several conditions have been found to undermine elaboration on a solution for both low and high levels of fear. When the problem is not perceived as serious, as is often the case when an appeal involves a low level of fear, an individual is unlikely to elaborate on the solution. For instance, if an accident involving alcohol merely causes stiffness in the joints and tearing of the skin on one's knees, one is unlikely to be motivated to elaborate on the solution (e.g., designate a person to serve as driver). When the harmful consequences are perceived as too severe, as in the case of the high-fear appeal illustrated above, one may engage in defensive denial of the message by denying either the existence of a problem (e.g., "I only have two drinks if I'm driving") or its importance (e.g., "Drinking is not the only cause of traffic accidents"). Again, there is little elaboration on the steps recommended in the solution.

The above analysis suggests that an appeal generating low levels of fear would benefit by more elaboration on the harmful consequences so that recipients are moti-

vated to seek a solution. By contrast, a message that evokes high levels of fear would benefit from a decrease in elaboration of the harmful consequences and a focus on the solution. To examine these predictions, interventions are needed that can enhance or undermine the level of elaboration on the harmful consequences and thus determine the effectiveness of a fear appeal. Relevant literature is reviewed with this goal in mind.

### EFFECTS OF FEAR AROUSAL

The impact of high fear arousal appears to be influenced by the level of defensive maneuvers people engage in when faced with a threatening message. These defensive techniques may include avoiding the message, minimizing the severity of the threat, selectively attending the message, discounting the threat, and denying its personal relevance (Eagly and Chaiken 1993; Rogers 1983). Along these lines, Janis and Terwillinger (1962) found that subjects generated more counterarguments and had poorer recall of the harmful consequences of smoking when high rather than low levels of fear were evoked by an appeal. These findings suggest that "the more strongly fear is aroused by a warning communication, the more strongly motivated the person will become to avoid symbolic responses and thought sequences which lead him to recall or to focus his attention on the essential content of the arguments and conclusions" (Janis and Terwillinger 1962, p. 409). If this observation is correct and a high level of fear arousal interferes with message processing by prompting message avoidance, the presence of an intervention that reduces the desire to avoid a high-fear appeal should enhance its impact.

Additional insight about how fear arousal affects persuasion is offered in a study conducted by Janis and Feshbach (1953). Three messages were designed to evoke low, medium, and high levels of fear. This entailed varying the number and severity of problems that were described as arising from poor dental hygiene and either using or not using personal language and vivid pictures to describe the problems. Conformity to the message's recommended toothbrushing practices was assessed by having subjects report on their toothbrushing behavior one week prior to and one week after message exposure. The findings indicated that only the low-fear appeal produced a significant gain in conformity. The medium appeal generated a marginally significant increase, whereas the high-fear appeal proved ineffective in increasing conformity.

From our earlier discussion, we suggest that Janis and Feshbach's (1953) findings were a function of their appeals' varying the level of problem elaboration. Specifically, their high-fear appeal featured personalized language (e.g., "This can happen to you") and was accompanied by vivid photographs of tooth decay and mouth infections. Our view is that the use of self-reference and vivid pictures of the consequences in the

high-fear appeal may have prompted an increase in elaboration of the problems, an assertion that is supported by work in the effects of both self-reference and vividness (Bower and Gilligan 1979; Kisielius and Sternthal 1984; Rogers, Kuiper, and Kirker 1977). In turn, the elaboration of problems may have limited the processing of the solutions offered by the message, an assertion that is consistent with the absence of references to the original appeal found in subjects' open-ended responses and the greater susceptibility to counterpropaganda. Thus, Janis and Feshbach's (1953) findings for the high-fear condition suggest that high fear arousal accompanied by substantial problem elaboration may undermine persuasion because it interferes with elaboration on the recommended solutions.

Janis and Feshbach's (1953) results for the low-fear condition also seem congenial with the notion that some elaboration on the problems contained in the message enhances its persuasive impact. Along these lines, it might be noted that Janis and Feshbach's low-fear message only included three types of problems: cavities, tooth fillings and decay, and mouth and gum infections, whereas the high-fear message contained references to seven types of problems: toothaches, tooth extractions and other painful dental work, tooth fillings, mouth and gum infections, discolored teeth, decayed teeth, and cavities. Because subjects were given the same amount of time to process each message (15 minutes), they may have had the opportunity to elaborate on each of the problems described in the low-fear appeal. Janis and Feshbach's low-fear condition also included pictures of healthy teeth that may have encouraged elaboration of the solution. This premise is supported by the observation that in relation to a control message that did not include any health consequences, subjects in the low-fear condition were able to provide significantly more explicit references to the problems and the solutions listed in the original fear message a week after message exposure. Thus, it appears that a low-fear appeal may be more persuasive if it is accompanied by the opportunity or ability to elaborate on the message-related problems and solutions.

Although Janis and Feshbach (1953) provide evidence on how an increase in problem elaboration decreases message processing for a high-fear appeal and facilitates message processing for a low-fear appeal, they do not examine the effects of reduced problem elaboration for low- and high-fear appeals. Specifically, they do not include conditions that reduced problem elaboration for the high- and low-fear appeals to test whether a decrease in problem elaboration would enhance the persuasiveness of a high-fear appeal and reduce the persuasiveness of the low-fear appeal. These conditions are tested in the present study.

Support for our account of the effects of fear appeal would be of both theoretical and practical interest. From a theoretical perspective, confirming evidence would specify the relationship between problem elaboration

and persuasion. Although there is evidence documenting the relationship between elaboration of the solution and persuasion (Janis and Feshbach 1953; Leventhal 1970), the relationships between problem elaboration and persuasion and between problem elaboration and solution elaboration have not been reported. To provide a test for the mediating role of problem elaboration, we compare the effect of increasing and reducing the level of problem elaboration on the persuasiveness of low- and high-fear appeals. In addition, we conduct a series of mediation tests to support the causal direction of the relationship from problem elaboration to solution elaboration to persuasion. From a practical perspective, our investigation will identify elaboration interventions that are likely to enhance the persuasiveness of low- and high-fear appeals.

### VARYING PROBLEM ELABORATION

To test our view, a suitable way to manipulate problem elaboration and fear arousal was needed. The study by Janis and Feshbach (1953) just described suggests that self-reference is a means of varying problem elaboration. The emerging view is that information about the self includes a vast array of knowledge (e.g., physical appearance, past experiences, behavior patterns, attitudinal likes and dislikes, and relationships toward others), that renders the self a source of one of the richest and most elaborate networks in memory. Because people have more knowledge about themselves than they have about others, events encoded with respect to the self can be made more elaborate than events encoded with respect to others (Bower and Gilligan 1979; Burnkrant and Unnava 1995; Greenwald and Pratkanis 1984; Kuiper and Rogers 1979; Rogers et al. 1977). Thus, we expected greater elaboration when the problem was directly related to the self (reader) rather than someone else.

The Janis and Feshbach (1963) study also implies that varying the vividness of the stimulus is a viable means of varying problem elaboration. We chose imagery processing for this purpose because it prompts more or less elaboration of a message while allowing us to hold the content of the message constant (MacInnis and Price 1987).

The effects of imagery processing on elaboration are well documented (Kisielius and Sternthal 1984; MacInnis and Price 1987). For example, Brown, Keenan, and Potts (1986) show that imaging oneself produces greater elaboration than imaging someone else (Bone and Ellen [1992]; for an exception, see Lord [1980]). Thus, we expect even greater elaboration on the problem when recipients are asked to imagine themselves suffering the consequences of noncompliance.

To test whether a decrease in problem elaboration would increase persuasion for a high-fear appeal and reduce persuasion for a low-fear appeal, an appropriate

intervention to reduce vividness was sought. Research reported by McGill and Anand (1989a, 1989b) suggests that an instruction to image is likely to enhance elaboration, whereas instructions to process a message in an objective manner and not use imagery are likely to encourage subjects to be literal and suppress elaboration. Their studies suggest that such objective processing instructions prompt subjects to rely on the message information itself rather than relate the information to their prior feelings and beliefs about the message content. Consistent with this view is the premise that persuasion under objective processing is determined more by learning the message content than the associations connected to the message content. Thus, we expect decreased problem elaboration when recipients are instructed to think objectively about the problem as being someone else's.

We applied these findings to our hypotheses on the relationship from fear arousal to problem elaboration to persuasion. Recall that we expected conditions that increase problem elaboration to increase solution elaboration and thus persuasion for a low-fear appeal and to decrease solution elaboration and persuasion for a high-fear appeal. Thus, the high-fear appeal should be less persuasive than the low-fear appeal in the imagery and/or self-reference conditions. By contrast, we predicted that a decrease in problem elaboration should increase elaboration of the message solution and, thus, persuasion for a high-fear appeal and should decrease solution elaboration and persuasion for a low-fear appeal. Thus, the high-fear appeal should be more persuasive than the low-fear appeal in the objective processing and/or other-reference conditions.

### METHOD

#### Subjects

The experimental treatments were administered in a 2 (low fear/high fear)  $\times$  2 (self-reference/reference to others)  $\times$  2 (imagery/objective processing) between-subjects design. Ninety-seven smokers, recruited from a pool of students at a large eastern university, participated in the study, which required them to read a pamphlet on smoking, put it aside, and answer questions in a booklet. The sample group had smoked for, on average, 4.2 years; 73 percent of the subjects had tried to quit at least once, 62 percent claimed to have suffered from the side effects of smoking, and all of them had heard about a nicotine patch as a possible method to reduce the incidence of smoking.

#### Stimulus

In accordance with the design to study fear appeal most commonly used in academic research (Eagly and Chaiken 1993; Hovland et al. 1953), the first part of the appeal was devoted to the consequences of smoking. To manipulate the point of reference, 51 subjects in

the self-reference condition were exposed to an ad that employed second-person wording ("Cigarette smoking is dangerous to your health"). The remaining subjects were assigned to the other-reference condition, in which the message used third-person wording ("Cigarette smoking is dangerous to the health of those close to you"). This operationalization departs from the traditional operationalization of reference to others. Rather than use a manipulation of reference to others that involves directing the message recipient to change someone else's smoking behavior (Bower and Gilligan 1979; Rogers et al. 1977), we sought to change the recipient's own smoking behavior because of concern for others. Our operationalization also seemed appropriate because it is more consistent with the other-reference campaigns used by marketing practitioners (Hinsberg 1990; Stuterville 1970).

The manipulation of outcomes in the low- and high-fear appeals was based on those used by the American Cancer Association. The low-fear appeal included outcomes such as coughing, wheezing, fever, weakness, and weight loss (see App. A for samples of appeals) that could result in a predisposition for shortness of breath, especially during physical exercise. The high-fear condition included more dire outcomes: drooping eyelids, shoulder and arm pain, difficulty in swallowing, and swollen lymph nodes in the neck, resulting in atherosclerosis, which predisposes the sufferer to heart attacks and possible death. This design, which includes multiple symptoms and consequences, is similar to the one used by Janis and Feshbach (1953) in their dental hygiene study. The appeals were also designed to be of equal length (approximately seven health consequences and 112 words in each message).

The harmful outcomes were followed by recommendations to reduce the incidence of smoking. Again, this ordering of problems and recommendations was based on Hovland et al.'s (1953) design. All the appeals had the same set of recommendations: they advocated trial of the Wonder patch (a fictitious name). Our information about how to apply the Wonder patch was obtained from companies marketing other nicotine patches. Recommendations on how to use and remove the patch were included in the second half of the message (see App. B for the recommendations).

The third between-subjects variable was the type of processing instructions given to subjects. The manipulation of imagery and objective processing was adopted from McGill and Anand (1989b). Half the subjects received the following instructions to engage in imagery processing.

We do request that you read the ad carefully, using your imagination to help you get a sense of the content of the ad. Utilize the power of your imagination to help you visualize this situation.

The other half of the subjects received the following objective processing instructions.

We do request that you read the ad carefully, being well-reasoned and logical to help you get a sense of what is being presented. Don't let your imagination get the better of you. Rather, try to objectively understand the content of the ad.

## Procedure

Subjects were run in large groups with all eight conditions randomized within each group. The experiment took approximately half an hour to complete. The questionnaire was administered after subjects read the pamphlet on smoking.

To check the level of elaboration, subjects were asked to list their thoughts immediately after message exposure. They were told not to describe what was in the message itself but rather what was going through their minds as they read the message. A person who was blind to the experimental conditions classified the thoughts as related to the problem (e.g., "I didn't know smoking made eyelids droop") or as related to the patch or the solution (e.g., "I don't have any non-hairy areas on my body").

Subjects next indicated the level of message persuasion on the basis of their agreement with the message's solution. Six seven-point semantic differential attitudinal scales were used to measure subjects' estimates of whether they were likely to follow the recommendations to stop smoking by using the patch, how likely they were to buy the patch, whether they would recommend the patch to a friend, how interested they would be in learning more about the patch, how likely they were to discuss the patch with a friend, and whether they wanted to receive an additional information sheet on the patch.

Several additional measures were included as possible covariates: gender, frequency of behavior, familiarity with the effects of smoking, familiarity with the actions one could take to stop smoking, familiarity with other patches, whether the subject had suffered any health effects from smoking or if anyone they knew had suffered health effects from smoking, whether they felt vulnerable to the dangerous effects caused by smoking, if they had tried to quit before, and whether any members of their family or close friends smoke. There were no significant main effects of the covariates. Although there were some significant interactions between the covariates and the independent variables, these results were not interpretable and thus will not be discussed further.

To assess the adequacy of the fear arousal manipulation, subjects indicated the degree to which the ad made them feel very unafraid/very afraid, relaxed/tense, calm/agitated, and restful/excited on a seven-point semantic differential scale. We also included several additional measures to check the potential effects of the level of fear arousal on various affective and cognitive responses identified in previous research. Affective responses were examined by having subjects indicate their level of agreement with the extent to which the ad made

them feel guilty, shameful, angry, remorseful, and sad on seven-point scales. As none of these emotions were significantly different across treatments, they were not considered in subsequent analyses. In the same way, analysis of several potential cognitive mediators, such as perceptions about the amount of information contained in the message, message efficacy, and perceived susceptibility, believability, and credibility of the message, indicated that the two levels of fear and the other independent variables did not vary on these dimensions ( $F$ 's < 1).

Point of reference was examined by means of several indicators. Self-reference was inferred on the basis of subjects' responses to questions about the extent to which the ad helped them to lead a more healthful life and helped prevent them from suffering because they smoke. The other-reference indicators were helping others to lead a more healthful life and helping to prevent others from suffering because they were in close proximity to the smoker.

Three additional measures were then administered. Elaboration was assessed by the number of related scenes and events generated while subjects were reading the ad (e.g., "I remember how difficult it was for me to breathe before my first cigarette every morning"). Imagery was examined by asking subjects on a seven-point scale how easily the message was pictured or imagined. The extent to which subjects engaged in literal message processing was determined by asking subjects to recall what they remembered from the smoking pamphlet. A recall score was computed by assigning one point for remembering each of the four steps outlined in the message recommendations.

Finally, to evaluate the possibility that individual differences in ability to image may have influenced the imagery evoked by the communication, we asked subjects to complete a shortened version of Bett's Questionnaire upon Mental Imagery Scale (Bett 1909). Twelve items were used to estimate whether individuals could imagine positive (e.g., "Can you see the car with a handsome couple inside?"), neutral (e.g., "Can you see a car standing in front of a house?"), and negative events (e.g., "Can you see it get out of control and crash through the house?"). As there were no differences in subjects' overall ability to image across treatments, this measure is not included in any of the subsequent analyses ( $F$ 's < 1).

## RESULTS

### Overview

We predicted that the low-fear appeal should be more persuasive than the high-fear appeal when the message encourages problem elaboration. This effect should occur because an increase in problem elaboration should enhance elaboration on the solution and thus persuasiveness in the low-fear condition. A low-fear appeal

should prompt more problem and solution thoughts than a high-fear appeal when the message encourages problem elaboration (self-reference, imagery processing). By contrast, a high-fear appeal should be more persuasive than a low-fear appeal when the message discourages problem elaboration. This effect should occur because a decrease in focus on the problem should reduce the defensive tendency to avoid the message and should increase message elaboration and thus increase persuasion. This prediction would be supported by more problem and solution thoughts in the high-fear condition than the low-fear condition when the message discourages problem elaboration (with reference to others and/or objective processing).

### Manipulation Checks

*Fear Arousal.* The four items used to measure arousal were averaged and summed to form a fear index ( $\alpha = .89$ ). An ANOVA indicated that the treatments were effective in creating two different levels of fear arousal ( $\bar{X} = 1.94$ ,  $SD = .94$  vs.  $\bar{X} = 2.59$ ,  $SD = 1.46$ ;  $F(1,91) = 5.89$ ,  $p < .05$ ). Thus, despite the fact that each message included recommendations that were designed to reduce fear arousal, there was a significant difference in fear arousal for the low- and high-fear appeals. The main effect of point of reference ( $F(1,91) = 1.20$ ,  $p = .27$ ), type of processing, and the two- and three-way interactions among fear, type of processing, and reference on the fear index were not significant ( $F$ 's < 1).

*Reference.* An ANOVA indicated that those in the self-reference condition perceived the ad as directed toward them ( $\bar{X} = 5.08$ ,  $SD = 1.95$ ) more than those in the other-reference condition ( $\bar{X} = 4.02$ ,  $SD = 1.71$ ;  $F(1,94) = 7.29$ ,  $p < .01$ ) on the self index; those in the other-reference condition saw the target of the ad as someone else ( $\bar{X} = 4.33$ ,  $SD = 1.11$ ) rather than themselves ( $\bar{X} = 3.42$ ,  $SD = 2.14$ ;  $F(1,94) = 4.16$ ,  $p < .05$ ) on the other index. In the same way, there were more thoughts about others in the other-reference condition ( $\bar{X} = .48$ ,  $SD = .65$ ) than the self-reference condition ( $\bar{X} = .21$ ,  $SD = .50$ ;  $F(1,96) = 5.36$ ,  $p < .01$ ). The number of thoughts about the self did not differ by treatment ( $F < 1$ ). The main and higher-order effects of fear, type of processing, and the interaction between fear, type of processing, and point of reference were not significant on the reference checks ( $F$ 's < 1).

*Type of Processing.* An ANOVA indicated that those in the imagery condition generated more scenes and events ( $\bar{X} = 4.24$ ,  $SD = 1.49$ ) than those in the objective condition ( $\bar{X} = 3.29$ ,  $SD = 1.95$ ;  $F(1,94) = 4.50$ ,  $p < .05$ ). By contrast, those in the objective condition recalled more ( $\bar{X} = 3.00$ ,  $SD = 1.42$ ) than those in the imagery condition ( $\bar{X} = 1.63$ ,  $SD = 1.12$ ;  $F(1,94) = 3.94$ ,  $p < .05$ ). Subjects in the imagery condition also indicated on a seven-point scale that the

**TABLE 1**  
EFFECTS OF FEAR AROUSAL AND POINT OF REFERENCE ON PERSUASION, MESSAGE ELABORATION, AND RECALL FOR IMAGERY AND OBJECTIVE-PROCESSING CONDITIONS

	Imagery processing				Objective processing			
	Reference to others		Self-reference		Reference to others		Self-reference	
	Low fear	High fear	Low fear	High fear	Low fear	High fear	Low fear	High fear
Persuasion	2.80 (1.06)	3.82 (.99)	4.51 (1.52)	3.67 (.97)	3.98 (1.31)	4.95 (1.32)	3.17 (1.66)	3.94 (1.12)
Problem elaboration	.73 (.79)	1.78 (1.09)	2.67 (.87)	.69 (.75)	.69 (.86)	.77 (1.63)	.62 (.65)	1.08 (1.13)
Solution elaboration	.18 (.41)	1.33 (1.58)	2.44 (1.13)	.77 (.73)	.46 (.52)	2.18 (1.29)	.31 (.48)	.77 (1.07)
Solution recall	1.64 (1.10)	1.77 (1.83)	1.33 (1.23)	1.77 (1.03)	2.46 (1.33)	1.71 (1.11)	1.77 (.83)	1.85 (1.41)
<i>n</i>	11	10	12	13	13	13	13	13

NOTE.—Values shown are means (±SD).

message was more easily pictured or imagined ( $\bar{X} = 4.51, SD = 2.19$ ) than subjects in the objective condition ( $\bar{X} = 3.69, SD = 2.12; F(1,94) = 3.42, p < .05$ ). An ANOVA indicated no other significant differences on these two imagery measures or on the message recall measure across treatments (all  $F$ 's  $< 1$ , except for the type of processing  $\times$  reference interaction, for which  $F(1,94) = 1.28, p = .24$ ).

### Hypotheses Tests

The level of persuasion, the number of problem thoughts and solution thoughts, and the extent of recall categorized by treatment are shown in Table 1. The six items related to subjects' attitudes toward the patch were averaged for each subject because they loaded on one factor and formed a reliable persuasion index ( $\alpha = .90$ ). An ANOVA indicated that the three-way interaction between fear, point of reference, and type of processing was significant on the persuasion measure ( $F(1,90) = 5.10, p < .05$ ), problem thoughts ( $F(1,90) = 10.67, p < .01$ ), and solution thoughts ( $F(1,90) = 3.95, p < .05$ ). These outcomes are shown in Figure 1.

*Imagery Processing.* Our theorizing suggests that for a high-fear appeal, the presence of an intervention that undermined problem elaboration, such as other-reference, would enhance message processing and persuasion because subjects would be less likely to avoid the message. By contrast, a reduction in problem elaboration for the low-fear appeal would undermine message processing and favorable attitudes because an inconsequential message would be rendered even more inconsequential. This premise would be supported by more favorable attitudes and more problem and solution thoughts for the high-fear appeal than the low-fear appeal in the other-reference condition. Consistent with

these predictions, the interaction between reference and fear was significant on persuasion ( $F(1,90) = 10.26, p < .01$ ), problem thoughts ( $F(1,90) = 10.94, p < .01$ ), and solution thoughts ( $F(1,90) = 20.40, p < .01$ ). No significant effects were obtained for the recall measure ( $F$ 's  $< 1$ ).

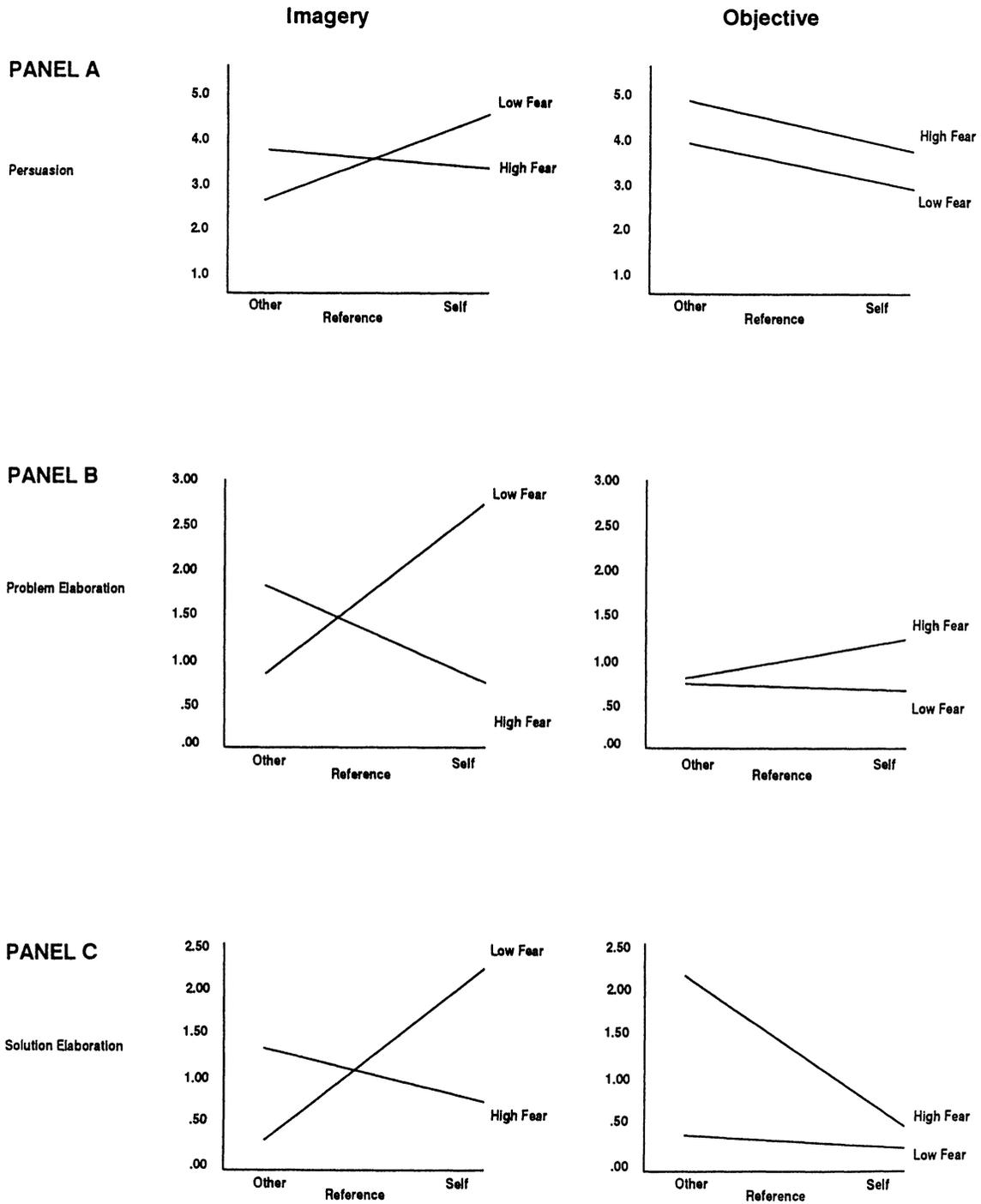
Inspection of the attitude and thoughts data indicated that subjects in the other-reference condition responded differently to the high- and low-fear appeals. As the graph of the imagery condition in Figure 1 (panel *A, left*) indicates, in the presence of the other-reference intervention to reduce problem elaboration, the high-fear appeal was more persuasive than the low-fear appeal ( $F(1,90) = 6.10, p < .05$ ). In the same way, panels *B* and *C* indicate there were more problem and solution thoughts for the high- than the low-fear appeal in the other-reference condition (for problem thoughts,  $F(1,90) = 6.81, p < .05$ ; for solution thoughts,  $F(1,90) = 7.13, p < .05$ ).

A different pattern of outcomes was observed in the self-reference condition, which was expected to enhance problem elaboration. An increase in problem elaboration was expected to increase the desire to avoid the high-fear message and stimulate the processing of the low-fear appeal. The data depicted in Figure 1 are consistent with these expectations. The low-fear appeal was marginally more persuasive than the high-fear appeal in the self-reference condition, which enhances problem elaboration ( $F(1,90) = 2.19, p < .07$ ). In addition, there were more problem and solution thoughts for the low-fear appeal than the high-fear appeal in the self-reference condition (for problem thoughts,  $F(1,90) = 6.30, p < .05$ ; for solution thoughts,  $F(1,90) = 16.16, p < .05$ ).

*Objective Processing.* We expected the same pattern of results in the objective processing condition as was obtained in the imagery condition. Specifically, the other-reference intervention was expected to enhance message processing and persuasion for the high-fear ap-

FIGURE 1

INTERACTION BETWEEN FEAR AND POINT OF REFERENCE ON PERSUASION, PROBLEM, AND SOLUTION ELABORATION IN THE IMAGERY AND OBJECTIVE PROCESSING CONDITIONS



peal and reduce message processing and persuasion for the low-fear appeal. By contrast, the self-reference condition was expected to enhance message processing and persuasion for the low-fear appeal and undermine message processing and persuasion for the high-fear appeal. The pattern of results obtained for the objective condition is presented in the right-hand column of Figure 1. An ANOVA indicated a significant interaction between reference and fear for solution thoughts and recall (for solution thoughts,  $F(1,90) = 6.30, p < .05$ ; for recall,  $F(1,90) = 1.71, p < .05$ ). The predicted interaction between referencing and fear was not significant for persuasion or problem thoughts ( $F$ 's  $< 1$ ). Instead, there were two main effects for persuasion; the other-reference message was more persuasive than the self-reference message ( $F(1,90) = 11.97, p < .05$ ), and high fear arousal was more persuasive than low fear arousal ( $F(1,90) = 9.73, p < .05$ ). There were no significant effects obtained for problem elaboration (for fear,  $F(1,90) = 1.43, p > .10$ ; all other  $F$ 's  $< 1$ ).

Although the finding that the high-fear appeal was more persuasive than the low-fear appeal in the other-reference condition was anticipated, the lower persuasion of the low-fear appeal than the high-fear appeal in the self-reference condition was not. Our theorizing predicted that the low-fear appeal would be more persuasive than the high-fear appeal in the self-reference condition. The significant reference  $\times$  fear interaction for solution thoughts and recall enabled us to compare the high- and low-fear appeals in the self- and other-reference conditions in order to understand why persuasion was higher than anticipated for the low-fear other-reference message and lower than anticipated for the low-fear self-reference message.

The differences in the pattern of solution thoughts and recall offer some insight about the nature of persuasion in the objective processing condition. Specifically, we found that recipients elaborated more on the solution in the other-reference condition when exposed to the high- than the low-fear message ( $F(1,90) = 23.52, p < .05$ ). By contrast, subjects' solution recall was higher when exposed to the low- than the high-fear message ( $F(1,90) = 2.76, p < .05$ ). In the same way, solution thoughts were higher for the high-fear appeal in the other-reference condition than the self-reference condition ( $F(1,90) = 15.84, p < .05$ ), whereas solution recall was higher for the low-fear appeal in the other-reference condition than the self-reference condition ( $F(1,90) = 2.04, p < .05$ ).

These contrasting patterns of recall and elaboration indicate that persuasion is based on recall, not elaboration, in conditions that encourage literal message learning and discourage elaboration (i.e., objective processing, reference to others, and low fear). By contrast, elaboration determines persuasion under conditions that encourage subjects to relate message information to prior feelings and beliefs (i.e., imagery processing, self-reference, and high fear). This view can account for

our findings in conditions that encourage elaboration versus those conditions that suppress elaboration. Specifically, seven of our eight conditions encouraged a little or a lot of elaboration by evoking imagery processing, self-reference, and/or high fear. The pattern of problem and solution thoughts is consistent with persuasion in these conditions. By contrast, the low-fear, other-reference, objective processing condition did not include any elaboration mechanisms. In the absence of any intervention to prompt elaboration, subjects seem to have relied on their recall of the advocated solution to form a persuasion judgment.

The pattern of correlations between recall, solution elaboration, and persuasion is consistent with this view. The correlation between recall and persuasion is insignificant in all seven conditions that encourage at least some elaboration ( $p$ 's  $> .10$ ) but not in the objective processing, other-reference, low-fear condition ( $r = .64, p < .08$ ). These outcomes are in contrast to the significant correlations between solution elaboration thoughts and attitudes in the seven elaboration-enhancing conditions ( $r = .36, p < .05$ ) but not in the objective processing, other-reference, low-fear condition ( $r = .05, p > .70$ ). The implications of relying on recall, which is memory based, versus elaboration, which may be considered more as on-line processing, is addressed in more detail in the discussion section.

## Mediation Analyses

A series of path analyses were undertaken to determine whether problem elaboration mediates the relationship between fear and persuasion and whether solution elaboration mediates the relationship between problem elaboration and persuasion. In addition, we tested an alternative model to examine whether a change in problem elaboration had an effect on fear and persuasion. Unlike the first model, in the latter model the effect of problem elaboration on persuasion would be mediated by fear arousal.

We used Sobel's procedure as reported in Baron and Kenny (1986) to test the models outlined above. Four regression equations are tested for each model. For example, the relationship from fear arousal to problem elaboration to persuasion would be supported by (1) a significant effect of fear arousal on problem elaboration, (2) a significant effect of problem elaboration on persuasion, (3) a significant effect of fear arousal on persuasion, and (4) an insignificant effect of fear arousal on persuasion (full mediation) or a less significant effect than the results in Equation 3 (partial mediation) when the effect of problem elaboration is partialled out.

Table 2 outlines the four equations. Column 1 provides the standardized coefficients and their significance values for the mediating effect of problem elaboration. Column 2 repeats the analysis in column 1 for the mediating effect of total message elaboration on persuasion. Column 3 presents a separate test on the mediating role

TABLE 2

PATH ANALYSIS OF THE EFFECT OF FEAR AROUSAL ON PERSUASION AND ITS MEDIATION BY PROBLEM, TOTAL MESSAGE, AND SOLUTION ELABORATION

	Problem elaboration <sup>a</sup>	Total message elaboration	Solution elaboration
Fear → elaboration	.24	.21	.07*
Elaboration → persuasion	.23	.30	.23
Fear → persuasion	.22	.22	.22
Fear → persuasion (without elaboration)	.16*	.16*	.20

\*Values shown are standardized regression coefficients.

<sup>a</sup> $p > .10$  (all other  $p$ 's  $< .05$ ).

of solution elaboration. This analysis was conducted to rule out the possibility that there is a direct link between fear arousal and solution elaboration.

The results indicate that both problem elaboration and total message elaboration are significant full mediators of the relationship between fear arousal and persuasion. Fear arousal does not have a direct effect on persuasion. Rather, it causes elaboration on the message, and particularly the problem part of the message, which in turn determines persuasion. In addition, this analysis indicates that elaboration on the solution alone is not sufficient to determine the relationship between fear and persuasion. The results in row 1 of the solution elaboration column in Table 2 indicate that fear arousal does not have a direct link with solution thoughts ( $p > .50$ ), thus failing the first requirement for the mediation test. These results are also consistent with the view that problem elaboration must precede solution elaboration.

Further support for the effect of the order of problem and solution elaboration on persuasion was obtained by testing whether solution elaboration mediates the relationship between problem elaboration and persuasion. The analysis indicated that solution elaboration partially mediates the relationship between problem elaboration and persuasion. Applying Baron and Kenny's (1986) procedure, we found (1) a significant effect of problem elaboration on solution elaboration ( $\beta = .21$ ,  $p < .05$ ), (2) a significant effect of solution elaboration on persuasion ( $\beta = .23$ ,  $p < .05$ ), (3) a significant effect of problem elaboration on persuasion ( $\beta = .27$ ,  $p < .01$ ), and (4) a less significant (for partial mediation) effect of problem elaboration on persuasion when the effect of solution elaboration is partialled out ( $\beta = .19$ ,  $p < .08$  vs.  $\beta = .27$ ,  $p < .01$ ). These results indicate that elaboration on the problem determines elaboration on the solution, which in turn determines persuasion.

A third mediating test for the relationship from elaboration to fear arousal to persuasion was designed to rule out the possibility that an increase (decrease) in elaboration, especially problem elaboration, would increase (decrease) fear arousal and thus determine per-

TABLE 3

PATH ANALYSIS OF THE EFFECTS OF PROBLEM AND TOTAL MESSAGE ELABORATION ON PERSUASION AND THEIR MEDIATION BY FEAR AROUSAL

	Problem elaboration <sup>a</sup>	Total message elaboration
Elaboration → fear	.24	.21
Fear → persuasion	.16*	.16*
Elaboration → persuasion	.27	.33
Elaboration → persuasion (without fear)	.23	.30

\*Values shown are standardized regression coefficients.

<sup>a</sup> $p > .10$  (all other  $p$ 's  $< .05$ ).

suation. This model is based on the premise that an increase in problem elaboration for the low-fear appeal may increase the level of fear arousal, which in turn would increase persuasion. It is also based on the notion that a reduction in problem elaboration would decrease fear arousal and thus increase persuasion for the high-fear appeal. For purposes of comparison with Table 2, we conducted an analysis on problem elaboration (col. 1) and total message elaboration (col. 2). These results are presented in Table 3.

The results in Table 3 provide support for the assumption that a change in elaboration of problem and total message elaboration does not affect fear arousal. Two dimensions of the mediation tests remain unsatisfactory; the effect of fear arousal on persuasion is insignificant for problem elaboration and total message elaboration (Eq. 2) and the effect of problem elaboration ( $\beta = .23$ ,  $p < .03$ ) and total message elaboration ( $\beta = .30$ ,  $p < .01$ ) on persuasion remains significant (Eq. 4). The fact that the relationship from elaboration to fear arousal to persuasion is not supported provides additional support for the view that fear arousal is responsible for generating problem and solution elaboration, which in turn determines persuasion.

## DISCUSSION

It is widely recognized that persuasion is a function of fear arousal at the time a judgment is rendered for a threatening communication. Our findings extend previous work in this area by identifying how fear arousal affects persuasion. Specifically, we identify the process underlying the interfering effects of low and high fear arousal on persuasion.

Our results support the premise that a reduction in the level of problem elaboration reduces elaboration of the problem, solution, and the favorableness of attitudes for a low-fear appeal, whereas the same decrease in problem elaboration increases message elaboration and persuasion for a high-fear appeal. By contrast, problem elaboration that increases elaboration of the solution and persuasive impact for a low-fear appeal reduces

message elaboration and persuasion when the appeal arouses a high level of fear.

This pattern of elaboration and persuasion supports our premise about the process underlying the interference effects of low and high fear arousal on persuasion. For high fear arousal, the premise is that increasing the level of problem elaboration increases the extent to which the recipient will engage in defensive tendencies such as message avoidance and thus reduce message elaboration. Accordingly, interventions such as reference to others and objective processing enhance persuasion because by reducing the level of problem elaboration, they reduce the need to avoid the message. In the absence of a mechanism to reduce problem focus, these defensive avoidance tendencies are evidenced by poor elaboration of the problem and the solution.

A different process appears to be responsible for the persuasion effects of low-fear appeals. Low fear arousal interferes with persuasion because of insufficient motivation to elaborate on the message. Accordingly, interventions such as self-reference and imagery processing enhance persuasion because an increase in the level of problem elaboration provides the motivation necessary for message elaboration. This view is supported by increased processing of the message problems and solutions. In the absence of a mechanism to increase the amount of problem elaboration in the low-fear condition, there are very few problem and solution thoughts.

Our results also suggest that persuasion may be a function of memory-based message recall in the absence of message elaboration. When we discouraged subjects from elaborating on the problems by employing reference to others and objective processing in the low-fear message, they relied on solution recall to render their persuasion judgment. By contrast, when we discouraged subjects from elaborating on the problems in the high-fear message, they relied on their elaboration on the solution to render their persuasion judgment (see Lichtenstein and Srull 1987).

These findings suggest that the level of fear arousal may be positively related to the propensity to elaborate. In conditions of low fear, there may be very little motivation to elaborate; thus, in the absence of additional interventions to enhance elaboration and given instructions to engage in literal, objective processing, subjects may rely on what they can remember about the advocated recommendations in order to judge the message advocacy. On the other hand, a high level of fear may motivate subjects to elaborate on the problems and ignore the solution. Thus, in the presence of additional interventions to undermine problem elaboration, subjects seem to have diverted their elaboration focus to the solution.

Our findings discount a frequent explanation for the relationship between problem and solution elaboration. Our data indicate that the favorableness of attitudes was not undermined significantly in the condition

characterized by both high fear and high problem elaboration because the extent of problem elaboration distracted the recipient from processing the solution. In fact, the distraction hypothesis was not supported in either the low- or high-fear condition. In both fear conditions, the change in problem elaboration was consistent with solution elaboration. We believe that problem and solution elaboration are positively related in the low-fear condition because problem elaboration provides the motivation to seek a solution. Although the distraction hypothesis is more likely to be supported in the high-fear condition (Hovland et al. 1953), our data are more consistent with the findings for denial and avoidance obtained by Janis and Feshbach ([1953]; for similar findings, see also Janis [1967]; Janis and Terwillinger [1962]). Janis and Feshbach (1953) interpreted the higher acceptance of counterpropaganda and lack of message retrieval in the high-fear condition as a reflection of the recipient's motivation to avoid the message's threatening content. The recipient's tendency to avoid message processing rather than counterargue may be responsible for the lack of significant differences in persuasion for self- versus other-reference imagery processing in the high-fear condition. Specifically, an increase in counterargumentation may be necessary to significantly undermine persuasion in the self-reference imagery condition. As distraction implicates resource capacity and allocation of attention to the problem versus the solution whereas avoidance is related more to deliberate inattention, more research is needed to determine the conditions that produce the distraction versus the avoidance effects.

## APPENDIX A

### Low-Fear Self-Reference Condition: Cigarette Smoking Is Dangerous to Your Health

The habit of smoking cigarettes has been universally condemned by authoritative medical groups as a leading cause of several health problems. The earliest symptoms are so ordinary—coughing or wheezing—they are often dismissed. Other symptoms include fever, weakness, and weight loss.

Studying the arteries of cigarette smokers, pathologists have seen that the blood vessels of smokers such as you contain fatty plaques, which adhere to your walls and undermine your circulation. This condition predisposes you to shortness of breath especially during physical exertion.

Health problems are uniformly higher among smokers than among nonsmokers in both sexes, between the ages of 20–35.

### High-Fear Self-Reference Condition: Cigarette Smoking Is Dangerous to Your Health

The habit of smoking cigarettes has been universally condemned by authoritative medical groups as a leading

cause of lung cancer, heart attacks, and death. The early symptoms include drooping of upper eyelids, shoulder and arm pain, difficulty of swallowing and swollen lymph nodes in the neck.

Studying the arteries of cigarette smokers, pathologists have seen that the blood vessels of smokers such as you contain a great number of fatty plaques, which adhere to your walls and cut off your circulation. This condition known as atherosclerosis, predisposes you to heart attacks and possible death.

Death rates are uniformly higher among smokers than among nonsmokers in both sexes, between the ages of 20–35.

### Low-Fear Other-Reference Condition: Cigarette Smoking Is Dangerous to the Health of Those Close to You

The effects of secondary smoke has been universally acknowledged by authoritative medical groups as a leading cause of several health problems. The earliest symptoms are so ordinary—coughing or wheezing—they are often dismissed. Other symptoms include fever, weakness, and weight loss.

Studying the arteries of nonsmokers who were close to cigarette smokers, pathologists have seen that the blood vessels of these nonsmokers contain fatty plaques, which adhere to their walls and undermine their circulation. This condition predisposes the sufferer to shortness of breath especially during physical exertion.

Health problems are uniformly higher among nonsmokers close to smokers in both sexes, between the ages of 20–35.

### High-Fear Other-Reference Condition: Cigarette Smoking Is Dangerous to the Health of Those Close to You

The effects of secondary smoke have been universally acknowledged by authoritative medical groups as a leading cause of lung cancer, heart attacks, and death. The early symptoms include drooping of upper eyelids, shoulder and arm pain, difficulty of swallowing and swollen lymph nodes in the neck.

Studying the arteries of nonsmokers who were close to cigarette smokers, pathologists have seen that the blood vessels of these nonsmokers contain a great number of fatty plaques, which adhere to their walls and cut off their circulation. This condition known as atherosclerosis, predisposes the sufferer to heart attacks and possible death.

Death rates are uniformly higher among nonsmokers close to smokers in both sexes, between the ages of 20–35.

## APPENDIX B

### How Wonder Patches Work

Wonder patches contain nicotine. When you put a Wonder patch on your skin, nicotine passes from the

patch through the skin and into your blood. With repetition, smaller and smaller doses of nicotine are applied.

### How to Apply a Wonder Patch

- Step 1. Choose a non hairy, clean, dry area of your upper body or on the upper outer part of your arm.
- Step 2. Apply the sticky side of the Wonder patch to your skin. Press the patch firmly on your skin with the palm of your hand for about 10 seconds. Make sure it sticks well to your skin.
- Step 3. Wash your hands thoroughly.
- Step 4. After approximately 24 hours, remove the patch you have been wearing. Choose a different place on your skin to apply the next Wonder patch and repeat steps 1 to 3.

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