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Confounds in Fear Arousing Persuasive Messages:
Do the Paths Less Traveled Make All the Difference?

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CONFOUNDS IN FEAR AROUSING PERSUASIVE MESSAGES: DO THE PATHS LESS TRAVELED MAKE ALL THE DIFFERENCE?

By

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ABSTRACT

CONFOUNDS IN FEAR AROUSING PERSUASIVE MESSAGES: DO THE PATHS LESS TRAVELED MAKE ALL THE DIFFERENCE?

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The purpose of this investigation is to explore potential confounds in fear arousing persuasive messages. It is argued that these confounds moderate or mediate the relationship between fear arousing messages and attitude change. A 3 X 3 X 2 Solomon four-group design was employed. There were three message topics (bicycle helmets, tetanus, and alcohol consumption), three fear conditions (high, low, and control), and the presence or absence of a pretest. Subjects were assigned to conditions randomly with the constraint that comparable numbers of subjects were in each cell. A series of causal models were devised and tested. Path analyses indicated that perceived fear and perceived argument quality mediated the relationship between fear arousing content and attitude change. The exact structure of the path models varied as a function of message topic. The implications of the findings and directions for future research are discussed.

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REVIEW OF THE LITERATURE

Researchers interested in fear appeals have attempted to demonstrate and explain the causal relationship between the fear arousing content in a message, attitude, and behavior change (Chu, 1966; Higbee, 1970; Janis & Feshback, 1953; Leventhal, 1970; McGuire, 1969; Sutton, 1982). Although there are competing explanations for how and why fear appeals impact attitudes, most models see the fear-arousing content of persuasive messages as the initial causal variable followed by perceived fear, attitude toward the topic of the persuasive message, and then behavior. Put another way, most proponents of fear appeal models argue that fear arousing messages cause persons to perceive that they are fearful which in turn causes attitude and then behavior change (i.e., fear arousing content → perceived fear →attitude change → behavior change). In this way, messages high in fear arousing content should produce substantial perceived fear, and thereby, attitude and behavior change.

Considering the results of their meta-analysis, Boster and Mongeau (1984) conclude that, on average, researchers are able to induce small amounts of fear. Specifically, Boster and Mongeau found that the weighted mean of the correlations between the fear arousing content in a message and perceived fear is .36 (with a range from .17 to .81). The weighted mean of the correlations between fear arousing content and attitude change is .21 (with a range from -.25 to .63). Using the product rule, Boster

and Mongeau calculated the perceived fear-attitude change correlation (ryw) by dividing the fear arousing content-attitude change (rxw or .21) correlation into the fear arousing content-perceived fear (rxy or .36) correlation (i.e., rxw/rxy = ryw or .21/.36 = .58). Last, the weighted mean of the correlations between attitude change and behavior is .10 (with a range from -.36 to .69). The regressions of the consequent variables onto the fear arousing content were all linear. That is, there was no strong evidence of curvilinear or quadratic effects across the studies included in the meta-analysis. Results from a more recent meta-analysis are very similar (see Mongeau, in press). According to Boster and Mongeau,

> It is important to note that, according to most theories, perceived fear mediates the relationship between manipulated fear and attitude. If these theories are accurate, then it follows that if the fear appeal manipulation is not strong (if the fear manipulation-perceived fear correlation is small), then it is not possible for the fear manipulation to have a strong impact on attitude (p. 362).

In other words, the results of this meta-analysis call into question the causal model proposed by most fear appeal researchers. Boster and Mongeau argue that future researchers should be aware of the potential problems associated with fear arousing persuasive messages (i.e., confounds). In particular, Boster and Mongeau suggest that researchers examine the degree to which highly fearful messages are significantly more discrepant from participants' initial attitudes than messages low in fear arousing content. That is, a plausible alternative hypothesis is that the relationship between fear arousing

content and attitude change is mediated by message discrepancy (i.e., fear arousing content → message discrepancy →attitude change).

In a similar way, Witte (1993) argues that "extra-message variables should be identified and equated across fear appeal levels to prevent confounds" (p. 148). For instance, Witte argues that variables such as source credibility should be equated across levels of fear arousing content to reduce the possibility of confounding effects. It is also likely that a message feature such as argument quality, and an individual difference variable like involvement may confound the relationship between fear arousing persuasive messages and attitude change to some degree. Examining the potential confounding effects of these variables is important because they are central to explaining the relationship between persuasive messages and attitude change (i.e., Heesacker, Petty, & Cacioppo, 1983; Petty & Cacioppo, 1979, 1984; Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo, & Schumann, 1983). The purpose of this investigation is to determine the extent to which these specific variables confound the relationship between fear arousing messages and attitude change. The following literature review provides direction for the study.

Fear Arousing Persuasive Messages: An Overview

Defining fear appeals. Designers of fear arousing persuasive messages attempt to induce fear in the audience to change their attitudes in the direction advocated by the source. To construct a fear arousing persuasive message correctly, three components must be present. First, the message must demonstrate that there is some threat to the audience. Second, the message must show that the

audience is susceptible or vulnerable to the threat. Third, the message should illustrate that persons can avoid the threat by adopting the attitudes, intentions, and/or behaviors advocated in the message (Boster & Mongeau, 1984; Burgoon, 1989; Mongeau, in press; O'Keefe, 1990). Put another way, Boster and Mongeau (1984) contend that fear arousing persuasive messages should present an argument with the following components:

> 1) You (the listener) are vulnerable to a threat.
> 2) If you are vulnerable, then you should take action to reduce your vulnerability.
> 3) If you are to reduce your vulnerability, then you must accept the recommendations contained in this message.
> 4) Therefore, you should accept the recommendations contained in this message. (p. 371)

Theoretical foundations. According to Dillard (1994) and Witte (1992) there are three major theoretical approaches that have been employed to study fear arousing messages. These theoretical approaches are drive models, the parallel response model, and value expectancy theories. A recent addition to this theoretical montage is Witte's (1992) extended parallel process model. Each of these approaches will be discussed below.

Drive models. Early studies of fear arousing persuasive messages were guided by drive models (i.e., Hovland, Janis & Kelly, 1953). According to the proponents of these models, fear acts as a drive that causes individuals to accept the persuasive messages advocated by a particular source. In this way, message acceptance or attitude change is seen as a means of reducing fear. Central to these models is the assumption that high

amounts of fear arousing content should lead to high perceived fear and that high perceived fear should cause persons to align their attitudes with the position advocated by the source. Conversely, messages low in fear arousing content should lead to low perceived fear, and thereby, low message acceptance. More recent investigations have rejected the drive explanation and proposed more cognitive approaches for explaining the impact of fear appeals on attitude change (Beck & Frankel, 1981; Rogers, 1983; Sutton, 1982).

The parallel response model. Leventhal's (1970, 1971) parallel response model represents a cognitive approach to studying fear appeals. Leventhal argues that fear arousing messages induce danger and fear control processes in the receiver. Danger control refers to the problem-solving that persons do to deal with the threat presented by a fearful message. Thus, danger control processes are assumed to be cognitive. Conversely, fear control processes are presumed to be affective. Specifically, fear control is defined as an affective reaction that receivers experience as a means of coping with fearful messages. Like proponents of drive models, Leventhal (1970) predicts that,

> with respect to main effects, the parallel response model clearly leads us to expect that for the most part there will be positive associations between fear and persuasion. (p. 127)

Value expectancy theories. A third theoretical approach for studying fear arousing messages is characterized by value expectancy theories (Rogers, 1975, 1983; Rogers & Mewborn, 1976; Sutton, 1982). Rogers' (1975, 1983) Protection Motivation Theory (PMT) is an example of a value expectancy theory. According to the PMT, four elements

of a message are responsible for producing cognitive control processes: (1) perceived susceptibility to the threat in the message, (2) perceived severity of that threat, (3) perceived response efficacy based on proposed responses to the threat and (4) perceived self-efficacy. Perceived susceptibility refers to a person's beliefs about the degree to which they are likely to be impacted by the threat(s) presented in a fear arousing persuasive message. Perceived severity refers to a person's beliefs about the degree to which the threat(s) presented in a fear arousing persuasive message are intense or mild. Perceived response efficacy refers to a person's perception of the relative effectiveness of the response advocated in a message at reducing the threat. Perceived self-efficacy is the belief that one has the ability to carry out the suggested behaviors advocated in a particular message. According to Rogers, when each of these four variables is high, then protection motivation is also high and so is message acceptance or attitude change. A diagram of a causal model depicting the set of relationships predicted by PMT is shown in Figure 1.

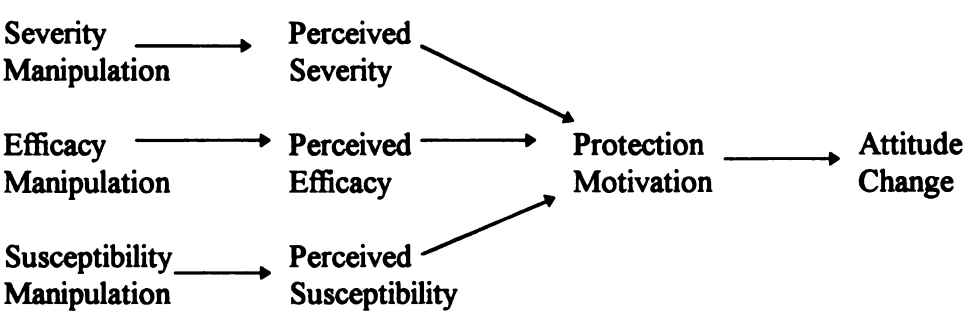

Figure 1. A Diagram of a Causal Model Depicting the Set of Relationships Predicted by PMT.

The extended parallel process model. Witte (1992) argues that the parallel response model is useful, but it lacks precision (p. 333). Moreover, she argues that Leventhal's (1970) model contains only general statements about fear control processes and danger control processes. Witte's model specifies at which points each process is likely to be invoked. In particular, Witte describes two general paths. She contends that if perceived efficacy and perceived threat are high, then persons are likely to initiate danger control processes. Danger control processes are assumed to be cognitive and related positively to protection motivation and adaptive changes (attitude change). A second route is taken if perceived efficacy is low and perceived threat is high. In this instance, persons are likely to initiate fear control processes. Fear control processes are assumed to be emotional and positively related to defensive motivation and maladaptive changes. Witte's model represents some of the more recent theoretical work on fear appeals. Diagrams of causal models depicting the set of relationships predicted by the EPPM are shown in Figures 2 and 3.

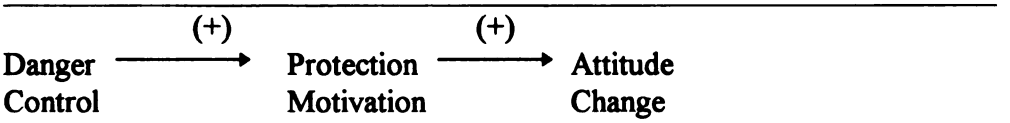

Figure 2. A Diagram of a Causal Model Depicting the Set of Relationships Predicted by the EPPM When Perceived Efficacy and Threat are High.

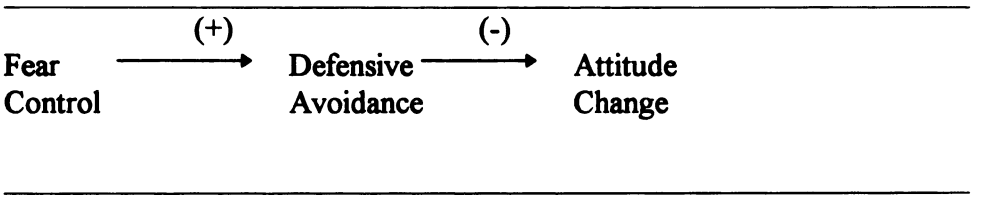

Figure 3. A Diagram of a Causal Model Depicting the Set of Relationships Predicted by the EPPM When Perceived Efficacy is Low and Threat is High.

Witte's (1994) recent test of the EPPM shows that the model was partially consistent with the data. Specifically, Witte found that higher perceptions of efficacy were related positively to attitude change. Equally important, in conditions of high efficacy, perceived threat mediated the relationship between fear and behaviors. However, some of Witte's predictions were not consistent with the data. For example, in conditions of high efficacy, perceived threat did not mediate the relationship between fear and attitude change. Witte also predicted that perceived fear and threat would increase more when efficacy was low than when efficacy was high. Results showed that perceived fear and threat did not vary across levels of efficacy. For a more comprehensive summary of the results and hypotheses, see Witte (1994, p. 124). The next section describes the research on message discrepancy.

Message Discrepancy: An Overview

Conceptualizing message discrepancy

Fink, Kaplowitz, and Bauer (1983) make a distinction between two types of discrepancy (positional and psychological). According to Fink and his colleagues, message or positional discrepancy refers to the absolute difference

between a receiver's position on an issue and the position advocated in a message. Thus, message discrepancy is the difference between two positions expressed in numerical units (Fink, Kaplowitz, & Bauer, 1983, p. 415). Psychological discrepancy refers to the extent (i.e., slightly, moderately, or extremely) to which a receiver perceives that his or her position is different from the position advocated in a message. In other words, even though the numerical difference between a receiver's position (i.e., 6) and a source's position (i.e., 7) is 1, a receiver may perceive that this difference is slightly, moderately, or extremely discrepant from his or her position.

Theoretical foundations. The linear discrepancy model predicts the relationship between message discrepancy and attitude change. This model evolved from Information Processing Theory (Anderson 1959; Anderson & Hovland, 1957). The basic assumption of Information Processing Theory is that receivers respond to messages by dividing them into elements such as arguments or assertions about the object that is being described by a source (Hunter, Danes, & Cohen, 1984). The receiver then compares each element to her or his corresponding belief(s) about the object, target or subject. Arguments or assertions that advocate positions that are consistent with existing beliefs will have no impact on attitudes toward the target. Conversely, if arguments advocate a position that is different (discrepant) from a receiver's beliefs then there may be attitude change. Hunter and his colleagues (1984) provide two postulates that describe the relationship between message discrepancy and attitude change: (1) the magnitude of [attitude] change is proportional to the discrepancy between the receiver's attitude and the position advocated by the message and (2) the [attitude] change is always in the direction of the message (p. 36). These

postulates may be expressed by the following equation that is know as the linear discrepancy model.

$$\Delta a = \alpha\,(m - a), \qquad 0 < \alpha < 1$$

In this model Δa represents attitude change, α represents a proportion of change, m represents a message, and a represents initial attitude. The following section discusses other prominent variables that may confound the relationship between fear arousing messages and attitude change.

Involvement, Argument Quality, and Credibility: An Overview

Theoretical foundations. The Elaboration Likelihood Model (ELM) devised by Petty and Cacioppo (1986b) is one of two modern, dual-processing theories of attitude change. The other is the Heuristic-Systematic Model (HSM) developed by Chaiken (1980, 1987). The present discussion is limited to the ELM for two reasons. First, these two theories attempt explain the relationship between persuasive messages and attitude change in a similar fashion. Second, the ELM has generated a greater amount of research than the HSM.

The ELM. According to the ELM, there are two general routes to persuasion. There are the central (systematic) and peripheral (heuristic) routes to persuasion. When processing via the central route, individuals are said to engage in "issue-relevant" thinking. To do this type of thinking, persons must have the capacity and motivation (involvement) to think about the issue in question. Moreover, the specific thoughts that persons generate (i.e., favorable or unfavorable) are influenced (at least partially) by the strength or quality of the arguments in a persuasive message. For instance, the ELM predicts that

strong arguments should lead to the generation of favorable thoughts. These thoughts should then lead to persuasion in the direction the source intended. Conversely, weak arguments should lead to the generation of unfavorable thoughts. These thoughts should then lead to no persuasion. That is, there should be no change in the direction that the source of the message intended when arguments are weak.

When processing via the peripheral route, individuals are said to engage in little or no "issue-relevant" thinking. In this mode of processing, persons rely on simple decision rules or mental heuristics like the attractiveness or credibility of the source. Put another way, persuasion via the peripheral route occurs without scrutinizing the quality of the arguments presented in the message, and is generally more ephemeral than persuasion via the central route. The section below provides a more detailed discussion of the role of involvement, argument quality, and source credibility in persuasion using the ELM framework.

Involvement. Numerous studies demonstrate the impact of involvement on attitudes (Brickner, Harkins, & Ostrom, 1986; Chaiken, 1980; Petty, Cacioppo, & Goldman, 1981; Johnson & Eagly, 1989). For example, involvement in a specific task is important because increased involvement is likely to reduce motivation losses (Chaiken, 1980; Petty, Cacioppo, & Goldman, 1981). In their meta-analysis, Johnson and Eagly (1989) identify three types of involvement. They define value-relevant involvement as "the psychological state that is created by the activation of attitudes that are linked to important values" (p. 290). Outcome-relevant involvement refers to the degree to which an individual believes that an attitude object is related directly to her or his personal goals.

Impression-relevant involvement refers to someone's desire to express attitudes that are socially appropriate. According to Johnson and Eagly, persons high in impression-relevant involvement are concerned about "holding an opinion that is socially acceptable to potential evaluators" (p. 292).

Johnson and Eagly (1989) summarize the results of their meta-analysis of the relationship between involvement and persuasion by saying that:

> We found that (a) with value-relevant involvement, high involvement subjects were less persuaded than low-involvement subjects; (b) with outcome-relevant involvement, high involvement subjects were more persuaded than low-involvement subjects by strong arguments and less persuaded by weak arguments; and (c) with impression-relevant involvement, high-involvement subjects were slightly less persuaded than low-involvement subjects. (p. 305)

Argument quality. A message that contains strong arguments has been characterized empirically as "one containing arguments such that when subjects are instructed to think about the message, the thoughts they generate are predominantly favorable." Conversely, a message that contains weak arguments has been defined empirically as one in which the arguments "are such that when subjects are instructed to think about them, the thoughts they generate are predominantly unfavorable" (Petty & Cacioppo, 1986a, p. 32). The Elaboration Likelihood Model (ELM) predicts that when receivers are motivated and capable (high elaboration) of engaging in thinking related to a particular issue, they are more likely to scrutinize the quality of the arguments in a message than in conditions when motivation and capability are low (low elaboration). In this way, persons who are motivated to think about a particular issue (highly involved)

should evaluate the relative quality of arguments, and therefore be less persuaded by poor arguments (i.e., faulty reasoning, bad evidence) and most persuaded by arguments that are strong. A number of studies have demonstrated this specific effect (i.e., Heesacker, Petty, & Cacioppo, 1983; Petty & Cacioppo, 1979, 1984; Petty, Cacioppo, & Goldman, 1981; Petty, Cacioppo, & Schumann, 1983). Using the conceptualizations of involvement presented in Johnson and Eagly's (1989) meta-analysis, one can make the distinction that persons who are high in outcome-relevant involvement evaluate the relative quality of arguments, and are therefore less persuaded by poor arguments and most persuaded by strong arguments. With the other types of involvement (value and impression-relevant) such an interaction has not been demonstrated.

Source credibility. Scholars have argued that there are two broad dimensions of credibility (Miller, 1987; O'Keefe, 1990). One dimension is called trustworthiness, and refers to the degree to which receivers perceive that a source is honest. The second dimension is known as competence or expertise, and refers to the degree to which receivers perceive that a source is knowledgeable. According to the Elaboration Likelihood Model (ELM), source credibility impacts attitude change only when involvement is low. In particular, the ELM predicts that when receivers are not motivated (i.e., low outcome-relevant involvement) to engage in thinking related to a particular issue, they are less likely to scrutinize the quality of arguments than in conditions when motivation is high (i.e., high outcome-relevant involvement). In this way, persons who are not motivated to think about a particular issue should not evaluate the relative quality of arguments, and therefore be most persuaded by heuristic cues (i.e., source credibility).

Consistent with this reasoning, a number of studies have demonstrated that as involvement increases, persons are less persuaded by the credibility of the source (i.e., Johnson & Scileppi, 1969; Kiesler & Mathog, 1968; Petty, Cacioppo, & Goldman, 1981; Ratneshwar & Chaiken, 1986; Rhine & Severance, 1970).

Rationale

Discrepancy. Boster and Mongeau's (1984) meta-analysis calls into question the causal model proposed by most fear appeal researchers (i.e., fear arousing content → perceived fear →attitude change → behavior). One problem that Boster and Mongeau note is that the relationship between fear arousing messages and attitude change may be confounded by message discrepancy. That is, messages that are intended to induce high fear may actually be more discrepant from the receiver's position than messages intended to induce low fear. This greater discrepancy in high fear conditions may be inducing greater attitude change than in low fear conditions. Recall that Boster and Mongeau found no strong evidence of curvilinear or quadratic effects across the studies included in the meta-analysis. The regressions of the consequent variables onto the fear arousing content were all linear. This finding is consistent with the predictions of the linear discrepancy model. That is, the linear discrepancy model predicts that highly discrepant messages (high fear) are more persuasive than messages low in discrepancy (low fear). Using this prediction, it is argued that highly fearful messages may induce significantly greater attitude change than messages low in fear because they are significantly more discrepant from receiver's initial attitudes than messages low in fear. Figure 4 presents the predicted path model.

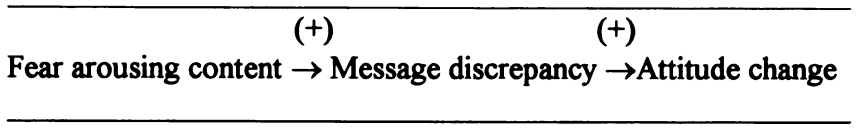

Figure 4. The Discrepancy Model.

Another theoretical possibility is that discrepancy could influence perceived fear. In particular, the more discrepant the message, the less it may be believed (i.e., source is perceived as low in credibility/trustworthiness). Therefore, less fear is perceived and less attitude change. Figure 5 presents the predicted path model.

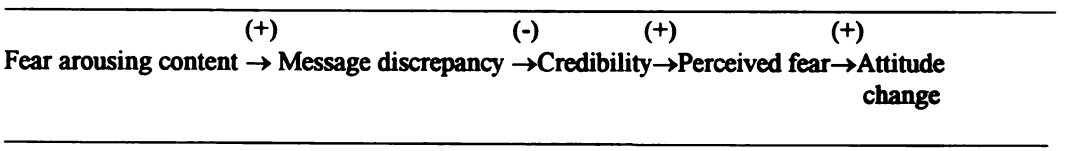

Figure 5. The Discrepancy and Credibility Model.

Although this model is possible, there are two reasons why it is unlikely to be consistent with the data. First, multiplying the valences in the predicted model yields a negative relationship between fear arousing content and attitude change. In other words, this model predicts that as fear arousing content increases attitude change decreases. This prediction is inconsistent with much of the literature on fear appeals. Second, the model presents a long causal string. Consequently, the multiplication of the path coefficients is likely to yield a small relationship (close to zero) between fear arousing content and

attitude change. This result would also be inconsistent with the meta-analytic data reported by Boster and Mongeau (1984).

Involvement and Argument quality. Using Johnson and Eagly's (1989) definitions of involvement along with the ELM, one can argue that persons who are high in outcome-relevant involvement evaluate the relative quality of arguments, and are therefore less persuaded by poor arguments and most persuaded by strong arguments. Applying this argument to the study of fear arousing persuasive messages, it is further argued that highly fearful messages may induce significantly greater attitude change than messages low in fear because they induce significantly more outcome-relevant involvement than messages low in fear. That is, highly fearful persuasive messages may be more effective at inducing attitude change than messages low in fear because they present receivers with significantly more negative and graphic consequences or outcomes than low fear messages. Essentially, the negative and graphic depictions in highly fearful messages may induce greater outcome-relevant involvement by focusing the receiver's attention on undesirable consequences or outcomes that are likely to occur if corrective action is not taken. With this heightened level of outcome-relevant involvement, persons are more likely to evaluate the quality of arguments critically, and thereby, be more influenced by those arguments that they perceive as strong than by those they perceive as weak. Figure 6 presents the predicted path model.

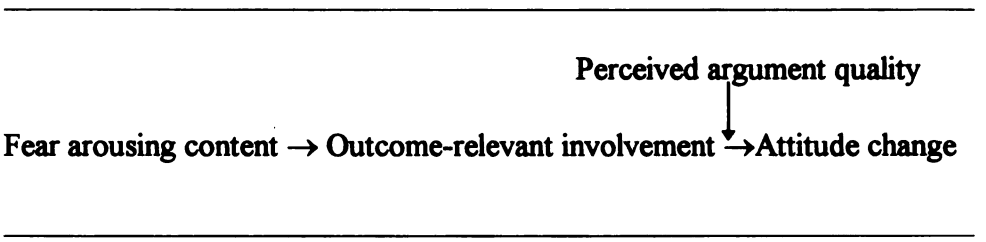

Figure 6. The Outcome-Relevant Involvement Model.

Involvement and Source Credibility. Consistent with the predictions of the ELM, credibility is more likely to impact attitudes in the direction the source intended when receiver involvement is low rather than high. Thus, one would expect that persons should be persuaded by the credibility of the source only in conditions where outcome-relevant involvement is low. That is, when outcome-relevant involvement is low, the credibility of the source should impact attitude change positively.

The variables discussed above can be incorporated into three large path models that describe the relationship between fear arousing content and attitude change in terms of emotion and cognition. The first model predicts that emotion and cognition work independently. That is, fear arousing content causes discrepancy, perceived fear, and outcome-relevant involvement independently. These variables then cause attitude change with credibility and perceived argument quality moderating the relationship between involvement and attitude change. Figure 7 presents the predicted path model. The second model predicts that emotion is antecedent to cognition. Here, fear arousing content causes involvement and perceived fear independently, perceived fear (emotion) then causes discrepancy (cognition). Figure 8 presents the predicted path model. The third

model predicts that cognition is antecedent to emotion. In this model, fear arousing content causes involvement and discrepancy independently, discrepancy (cognition) then causes perceived fear (emotion). Figure 9 presents the predicted path model.

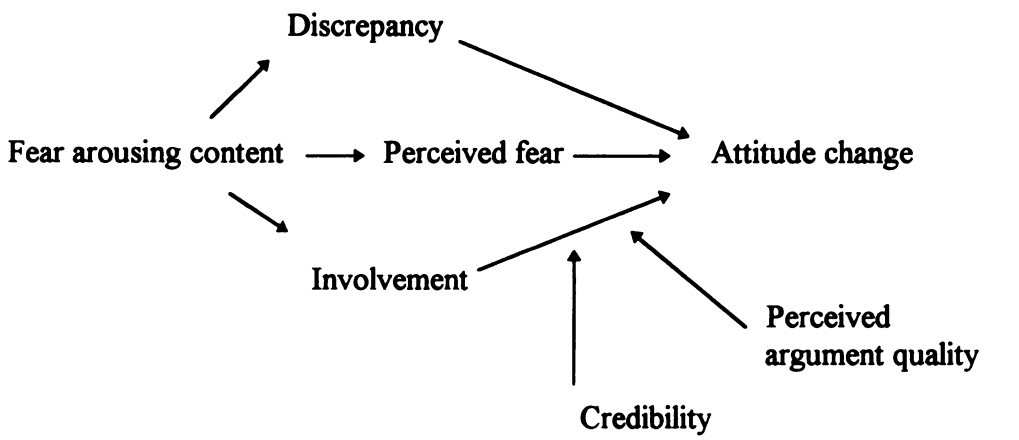

Figure 7. The Emotion-Cognition Independence Model.

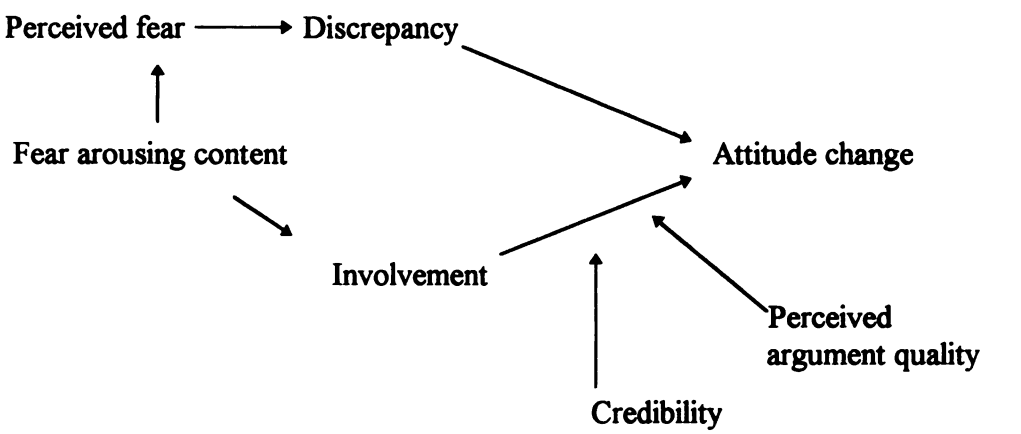

Figure 8. The Emotion Antecedent to Cognition Model.

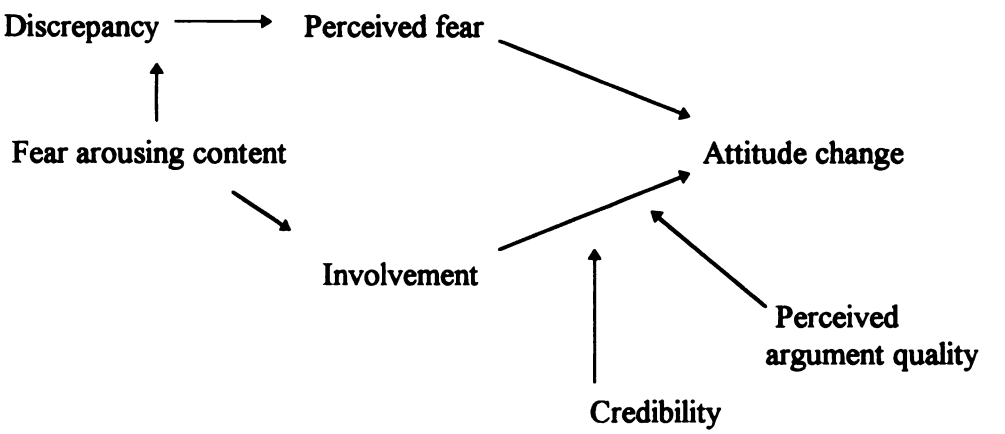

Figure 9. The Cognition Antecedent to Emotion Model.

Evaluating the models. There are two criteria for evaluating the fit of the path models (Boster, 1993). First, one assesses the size of the path coefficients. If they are not substantial, given what is considered substantial in fear appeal research, then the model is rejected. If a particular model is rejected, then possible sources of error are diagnosed. For example, the model may contain an insignificant mediating variable. If the path coefficients are substantial, then one uses a second criterion. Specifically, the extent to which the predicted (reproduced) correlations deviate from the obtained (actual) correlations is determined. If these deviations are substantial, then the model is rejected. One fails to reject the model, if the deviations are not substantial.

METHOD

Design. The experiment employed a 3 X 3 X 2 Solomon four-group design. There were three message topics (bicycle helmets, tetanus, and alcohol consumption), three fear conditions (high, low, and control), and the presence or absence of a pretest. Three message topics (devised for previous studies) were used to improve the generalizability of the present investigation. Subjects were assigned to treatment conditions randomly with the constraint that comparable numbers of participants were included in each cell (n = 30-32).

With random assignment to conditions, the Solomon four-group design has several strengths. First, pretesting of groups helps assess the comparability of the experimental and control groups. At the same time, this design assesses both the main effects of pretesting and the interaction between the experimental induction and the pretest (Campbell & Stanley, 1963; Smith, 1988). Boster and Mongeau (1984) found that when correlating the type of design with the size of the fear arousing content-attitude change correlation, there was "a tendency for larger correlations in posttest-only designs than in pretest-posttest designs" (p. 348). They attributed this result to the relative unreliability of change scores when compared to static scores. The Solomon four group design allows a comparison between posttest-only and pretest-posttest designs. Thus, it is possible to

determine if the results of the present study are consistent with Boster and Mongeau's meta-analysis.

Consistent with the definition of fear arousing persuasive messages discussed previously, the efficacy of all the messages was high. Severity and susceptibility were high in high fear conditions and low in low fear condition. Thus, measures of perceived efficacy, severity, and susceptibility were used to see if the inductions worked as expected. Equally important, these measures were used to examine if the data were consistent with the predictions of Protection Motivation Theory (PMT) and the Extended Parallel Process Model (EPPM).

Procedures. Subjects were told that the researchers were interested in "getting your opinions and reactions to some educational materials." In the pretest conditions participants were asked to report their initial attitudes about one of the three topics as well as their outcome, value, and impression-relevant involvement. All participants were asked to report their initial position on one of the topics, and then presented with a corresponding message that varied in fear arousing content (high, low, or control). After reading the message, participants were asked to indicate what position was advocated by the author. They were also asked to report their perceived efficacy, fear, severity, susceptibility, perceived involvement, and attitude. In addition, participants' perceptions of argument quality and source credibility were assessed. Before participants were dismissed, the purpose of the research was explained in detail. Any questions that participants had were answered. Participants were also asked not to reveal the nature of the research to anyone for the next six months.

Participants. Participants were recruited from introductory communication classes at a large Midwestern University. These students signed up during regular class periods and reported to the research room in groups of about 20. They received extra credit for their participation in the study. A total of 555 subjects participated in the study.

Bicycle helmet messages. The messages concerning bicycle helmets were originally devised and used by Witte (1991). The low fear message for the bicycle helmet portion of the study included statistics that demonstrated that the injuries due to bike accidents, while relatively frequent, were not severe (e.g., "561,765 emergency room visits were due to bike accidents, but all were minimal injuries and less than 0.002% of children in bike accidents die."). This message also included a black and white picture of a child who chipped her tooth during a bicycle accident.

The high fear message included harsh, abrupt declarations of death rates and risk factors associated with not wearing bicycle helmets. Statistics include an emphasis on death tolls (e.g., "1300 deaths per year, head traumas causing 85% of all bicycle fatalities"). There were several gruesome pictures of bicycling accident victims. For instance, one picture showed a woman whose skull was severed in half as a consequence of being hit by a car while riding her bicycle. Both the low and high fear messages were revised slightly for the present study by making references to MSU (i.e., Spartan Village) instead of Texas A&M where the messages were used originally. The position advocated in both the high and low fear messages was that one should wear a bicycle helmet when riding a bicycle.

Tetanus messages. The messages concerning tetanus were adopted from the work of Leventhal, Jones, and Trembly (1966, p. 390). Similar to the messages presented above, the high fear material differed from the low in that it was designed to create a strong sense of personal vulnerability to tetanus. The magnitude of danger was presented in a vivid manner through graphic language and pictures. For example, the high fear message said that, "The danger of tetanus is a good deal more widespread than most of us realize. One of the most frightening aspects of the disease is that it is always possible for you to contract it." One of the pictures included in this message showed a "patient who experienced massive complications during a tracheotomy that was performed to counteract the suffocating effects of a tetanus infection." In contrast, the low fear message said that, "Generally, the bleeding that accompanies a wound is sufficient to flush the area free of infection-producing bacteria. This cleansing process and the relative infrequency of oxygen-free environments greatly reduce the ability of the tetanus bacilli to produce the toxin." The low fear message included a microscopic picture of the tetanus virus. These messages were also revised slightly for the present study by including more recent publication dates on the case studies. The position advocated in both the high and low fear messages was that one should get a tetanus vaccination before infection occurs.

Alcohol messages. The messages concerning alcohol consumption were created and used by Kleinot (1980) and Kleinot and Rogers (1982). The high fear material differed from the low in that it was intended to create a strong sense of personal vulnerability to diseases because of alcohol consumption. The high fear message included pictures of a heart, liver, artery, and brain that had been severely damaged by alcohol

consumption. This message made references to serious health problems and death. For instance the said that, "Drinking is involved in several serious health concerns including harmful effects on the liver, the heart, the brain, and often death." Conversely, the low fear message said that, "Drinking is involved in several health concerns, including effects on the liver and the heart. These effects are not that serious for someone who is an average drinker, but it might be of benefit to be aware of them." The position advocated in both the high and low fear messages was that one should drink in moderation (less than two times a week) and not get intoxicated.

Control group message. All control groups read an article about a national teacher corps program. The article described the program and told the story of several college graduates who decided help some of America's troubled schools by becoming teachers.

Instrumentation

Perceived fear. The perceived fear scale was composed of six items with Likert-type response options. Participants responded to items like, "This message makes me feel frightened." Response options ranged from 1(disagree strongly) to 7 (agree strongly). These items were used by Witte (1991, 1992, 1994) and reliable from .86 to .97.

Positional and psychological discrepancy. Positional and psychological discrepancy were measured as in previous research (c.f., Fink et al., 1983; Kaplowitz, Fink, Mulcrone, Atkin, & Dabil, 1991). In the present study, it was assumed that positional and psychological discrepancy correlated in the same manner (positively and significantly) as in the work of Fink and his colleagues. It is profitable to attempt to measure each type of discrepancy independently to assess any potential context effects.

To measure positional discrepancy subjects were asked to report their initial position on each of the topics presented (i.e., helmets, tetanus, alcohol). For example, subjects were asked to report what percentage of the time they think they should wear a bicycle helmet. After, reading the helmet message, they were asked to indicate what percentage of the time the author of the message says to wear a bicycle helmet. A discrepancy scale was constructed by subtracting subjects' initial position on the discrepancy items from their perception of the author's position.

To measure psychological discrepancy, subjects were asked to think back to the percentage of time they thought they should wear a bicycle helmet before they read the message, and to rate how different they perceive their initial position was in contrast to the position advocated in the message. Like the instructions used in previous research, the subjects were told (c.f., Kaplowitz, et al., 1991):

> Imagine that 100 is moderately different from your own view. If you think that the difference between your view and the view expressed in the message is twice as much as the moderate difference, rate it as a 200. If you think that the difference between your view and the view expressed in the message is half as much as the moderate difference, rate it as a 50. If the view expressed in the message is NOT AT ALL different from your view, rate it 0 (zero). You may use any number you wish, from zero on up.

Involvement. Consistent with Johnson and Eagly's (1989) conceptualizations of involvement, participants were asked to report their value, outcome, and impression-relevant involvement. Each scale was composed of four items with Likert-type response options. For example, to measure value-relevant involvement, respondents were asked to respond to items like, "Bicycle safety is something that I value highly." To measure

outcome-relevant involvement, respondents were asked to respond to items like, "Bicycle safety has little impact on my life." To measure impression-relevant involvement, respondents were asked to respond to items like, "I would wear the proper safety equipment when riding my bike if I thought that others would think better of me for it." Participant response options for all involvement items ranged from 1(disagree strongly) to 7 (agree strongly). Changes in involvement were calculated by subtracting pretest scores from posttest scores..

Perceived argument quality. It is important to note that argument quality was not induced in this study. In other words, messages with strong and weak arguments were not created for this study. Instead, existing fear arousing persuasive messages were used, and subjects were asked to indicate to what degree (i.e., high-low) they perceived that these messages were compelling. A perceived argument quality scale was used because it is a more direct indicator of argument quality than the generation of positive or negative thoughts. Recall that the ELM posits that positive and negative thoughts are alleged consequences of argument quality and not direct indicators of the construct.

Perceived argument quality was assessed with one five-item semantic differential scale. Participants were asked to evaluate the quality of the arguments presented in the message by responding to items such as high-low, outstanding-poor, superior-inferior, great-lousy, impressive-unimpressive, marvelous-terrible. Participant response options for these items ranged from 1 (low) to 7 (high).

Source credibility. Source credibility was assessed with two seven-item semantic differential scales. One scale measured competence, and the other measured

trustworthiness. The competence dimension was indexed by items such as experience-inexperienced, informed-uninformed, trained-untrained, qualified-unqualified, skilled-unskilled, intelligent-unintelligent, expert-novice. Participant response options for these items ranged from 1 (inexperienced) to 7 (experienced). The trustworthiness dimension was indexed by items such as honest-dishonest, trustworthy-untrustworthy, reliable-unreliable, responsible-irresponsible, corrupt-uncorrupt, just-unjust, fair-unfair. Participant response options ranged from 1 (untrustworthy) to 7 (trustworthy).

Efficacy. Participants were asked to report their perceived response efficacy and self-efficacy. These items were composed of questions with Likert-type response options. For example, to measure perceived response efficacy, respondents were asked to respond to items like, "I believe that drinking alcohol in moderation is an effective way of decreasing alcohol related diseases." To measure perceived self-efficacy, respondents were asked to respond to items like, "I believe that drinking alcohol in moderation is easy for me." Participant response options for these items ranged from 1(disagree strongly) to 7 (agree strongly).

Severity and susceptibility. Participants were asked to report the degree to which they perceive that the threat presented in the message was severe and the degree to which they believe they were susceptible to that threat. These items were composed of questions with Likert-type response options. For example, to measure perceived severity, respondents were asked to respond to items like, "I believe that alcohol consumption results in significant diseases." To measure perceived susceptibility, respondents were asked to respond to items like, "I believe that my chances of having a health-related

problem because of alcohol consumption are high." Participant response options ranged from 1(disagree strongly) to 7 (agree strongly).

Attitude. Attitude toward message recommendations was assessed with one nine-item semantic differential scale. Participants were asked to report their attitude toward the position presented in the message (i.e., "I think that getting a tetanus shot before infection occurs is:") by responding to items such as good-bad, positive-negative, important-unimportant, smart-stupid, pleasant-unpleasant, easy-hard, nerdy-cool, right-wrong, rewarding-unrewarding. Participant response options ranged from 1 (bad) to 7 (good). The attitude change scale was devised by subtracting pretest scores from posttest scores.

Statistical analyses. The path models were tested using ordinary least squares (OLS) estimates of the parameters (McPhee & Babrow, 1987; Kenny, 1979: Pedhazur, 1982). This procedure generates a predicted matrix that can be compared to the obtained values of the correlations. The difference is tested using a chi-square statistic. A significant chi-square indicates that the predicted model departs significantly from the obtained data.

RESULTS

Preliminary Analyses

Confirmatory factor analyses (Hunter & Gerbing, 1982) were employed to test the dimensionality of all of the measures. This procedure showed that the measurement model for the scales varied as a function of message topic. For this reason, the results of the factor analyses are presented by topic. The measurement models for the alcohol consumption message are presented first followed by the bicycle helmet and tetanus messages.

Alcohol consumption message. Confirmatory factor analyses resulted in the retention of four attitude items, four perceived fear items, six discrepancy items, and five perceived argument quality items. The measurement models for all of the other instruments were unchanged. The reliabilities of the measures were estimated by coefficient alpha and found to be .92 for the perceived fear scale, .86 for the discrepancy scale, .84 for the posttest outcome-relevant involvement scale, .68 for the outcome-relevant involvement change scale, .91 for the posttest value-relevant involvement scale, .78 for the value-relevant involvement change scale, .74 for the posttest impression-relevant involvement scale, .28 for the impression-relevant involvement change scale, .85 for the susceptibility scale, .90 for the severity scale, .89 for the response efficacy scale,

.81 for the self-efficacy scale, .82 for the attitude posttest scale, .57 for the attitude change scale, .90 for the perceived argument quality scale, .91 for the trustworthiness scale, and .92 for the expertise scale.

Bicycle helmet message. Confirmatory factor analyses resulted in the retention of five attitude items, four perceived fear items, three discrepancy items, five perceived argument quality items, six trustworthiness, and six expertise items. The measurement models for all of the other instruments were unchanged. The reliabilities of the measures were estimated by coefficient alpha and found to be .94 for the perceived fear scale, .89 for the discrepancy scale, .87 for the posttest outcome-relevant involvement scale, .65 for the outcome-relevant involvement change scale, .92 for the posttest value-relevant involvement scale, .87 for the value-relevant involvement change scale, .58 for the posttest impression-relevant involvement scale, .10 for the impression-relevant involvement change scale, .86 for the susceptibility scale, .94 for the severity scale, .86 for the response efficacy scale, .81 for the self-efficacy scale, .88 for the attitude posttest scale, .75 for the attitude change scale, .94 for the perceived argument quality scale, .90 for the trustworthiness scale, and .93 for the expertise scale.

Tetanus message. Confirmatory factor analyses resulted in the retention of five attitude items, four perceived fear items, four discrepancy items, five perceived argument quality items, six trustworthiness items, six expertise items, and three items from the susceptibility, severity, response efficacy, and self-efficacy scales. The measurement models for all of the other instruments were unchanged. The reliabilities of the measures were estimated by coefficient alpha and found to be .92 for the perceived fear scale, .81

for the discrepancy scale, .72 for the posttest outcome-relevant involvement scale, .48 for the outcome-relevant involvement change scale, .88 for the posttest value-relevant involvement scale, .84 for the value-relevant involvement change scale, .66 for the posttest impression-relevant involvement scale, .42 for the impression-relevant involvement change scale, .88 for the susceptibility scale, .86 for the severity scale, .85 for the response efficacy scale, .70 for the self-efficacy scale, .90 for the attitude posttest scale, .79 for the attitude change scale, .91 for the perceived argument quality scale, .90 for the trustworthiness scale, and .92 for the expertise scale.

Pretest Effects

A preliminary concern was the threat of a pretest effect on participants' posttest attitude judgments. A series of analyses of variance were used to test the pretest effect hypothesis. The pretest had no statistically significant or substantial impact on posttest attitude scores for the alcohol (Ms = 20.19 no pretest, 21.04 pretest, F (1, 180) = 1.09; p > .05, η^2 = .01, r = .07), bicycle helmet (Ms = 21.21 no pretest, 21.27 pretest, F (1, 179) = .01; p > .05, η^2 = .00, r = .00), or tetanus messages (Ms = 25.34 no pretest, 25.46 pretest, F (1, 174) = .07; p > .05, η^2 = .00, r = .00). These results are not consistent with a pretest effect hypothesis.

Another concern was the actual persuasiveness of the messages. The analyses of variance found that subjects in the experimental conditions changed their attitudes more than the control groups. These differences in attitude change, however, were not all statistically significant. Specifically, subjects in the high fear condition changed their attitudes toward drinking alcohol in moderation (Ms = -.07 control, .55 low fear, 3.00

high fear, $\underline{F}$ (2, 90) = 8.60; $\underline{p} < .001$, $\eta^2 = .16$) significantly more than the low fear and control group. A Duncan multiple-range test indicated that the low fear mean was significantly ($p < .05$) different from the high fear mean. Dunnett's test to compare experimental means with control means showed that attitude change in the high fear condition differed significantly from the control group. Attitude change in the low fear condition did not differ significantly from the control group.

Subjects in the high fear group changed their attitudes toward wearing a bicycle helmet while riding a bike ($\underline{M}$s = .40 control, 2.52 low fear, 4.81 high fear, $\underline{F}$ (2, 89) = 7.11; $\underline{p} < .01$, $\eta^2 = .14$) significantly more than the control group. A Duncan multiple-range test indicated that the low fear mean was not significantly ($p > .05$) different from the high fear mean. Dunnett's test indicated that attitude change in the high fear condition differed significantly from the control group. Attitude change in the low fear condition did not differ significantly from the control group.

The attitude change in the experimental groups toward getting a tetanus shot before infection occurred ($\underline{M}$s = .63 control, 2.03 low fear, 1.33 high fear, $\underline{F}$ (2, 86) = 1.17; $\underline{p} > .05$, $\eta^2 = .03$) did not differ significantly from the control group. A Duncan multiple-range test indicated that the low fear mean was not significantly ($p > .05$) different from the high fear mean. Dunnett's test revealed no significant differences between any of the experimental group means and the control group.

Induction Checks

Variable analysis. The responses to the measures of perceived efficacy, severity, and susceptibility are reported to see if the inductions worked as expected. Recall that

consistent with the definition of fear arousing persuasive messages discussed previously, the efficacy of all the messages was high. Severity and susceptibility were high in high fear conditions and low in low fear condition. Equally important, these measures were used to determine if the data were consistent with the predictions of Protection Motivation Theory (PMT) and the Extended Parallel Process Model (EPPM).

Severity. For the alcohol message, subjects in the high fear condition ($M = 26.34$) perceived that diseases resulting from alcohol consumption were significantly more severe ($F(2, 185) = 7.52$; $p < .01$, $\eta^2 = .08$) than the low fear ($M = 24.24$) and control group ($M = 24.59$). A Duncan multiple-range test indicated that the low fear mean was significantly ($p < .05$) different from the high fear mean. Dunnett's test revealed that the difference between the high fear group and the control group was significant. The difference between the low fear mean and the control group mean was not statistically significant.

For the bicycle helmet message, subjects in the high fear condition ($M = 24.41$) perceived that injuries resulting from bicycling accidents were significantly more severe ($F(2, 184) = 29.07$; $p < .001$, $\eta^2 = .24$) than the low fear ($M = 18.15$) and control group ($M = 20.87$). A Duncan multiple-range test indicated that the low fear mean was significantly ($p < .05$) different from the high fear mean. Dunnett's test revealed that the differences between the experimental groups and the control group were significant.

For the tetanus message, subjects in the high fear condition ($M = 19.98$) perceived that tetanus infections were significantly more severe ($F(2, 177) = 38.59$; $p < .001$, $\eta^2 = .30$) than the low fear ($M = 17.67$) and control group ($M = 14.63$). A Duncan multiple-range test indicated that the low fear mean was significantly ($p < .05$) different from the

high fear mean. Dunnett's test revealed that the differences between the experimental groups and the control group were significant.

Susceptibility. Subjects who read the alcohol message and were in the control group (M = 13.72) perceived that they were significantly more susceptible to diseases resulting from alcohol consumption (F (2, 185) = 3.20; $p < .05$, $\eta^2 = .03$) than the low fear (M = 11.44) but not the high fear group (M = 11.89). Duncan's multiple-range test revealed that the difference between the high and low fear groups was not significant ($p > .05$). Dunnett's test indicated that the control group perceived great susceptibility than the low fear group. The difference between the high fear group and the control group was not statistically significant.

Subjects who read the bicycle helmet message and were in the control group (M = 19.39) seemed to perceive that they were more susceptible to injuries resulting from bicycling accidents than the low fear (M = 17.65) and high fear group (M = 17.46). This difference, however, was not statistically significant (F (2, 184) = 1.89; $p > .05$, $\eta^2 = .02$). Duncan's multiple-range test revealed that the difference between the high and low fear groups was not significant ($p > .05$). Dunnett's test indicated that the differences between the control group and the experimental groups were not statistically significant.

Subjects who read the tetanus message and were in the high fear condition (M = 9.63) perceived that they were significantly more susceptible to tetanus infection (F (2, 177) = 6.68; $p < .01$, $\eta^2 = .07$) than the low fear (M = 7.12) and control group (M = 7.38). Duncan's multiple-range test indicated that the difference between the high and low fear groups was significant ($p > .05$). Dunnett's test indicated that the difference between

the high fear group and the control group was statistically significant. The low fear mean and the control group mean were not significantly different from one another.

Response efficacy. For the alcohol message, subjects in the experimental groups (Ms = 20.54 low fear, 21.97 high fear, F (2, 185) = 6.13; p < .01, η^2 = .06) perceived that drinking alcohol in moderation was a significantly more effective way of reducing diseases related to alcohol consumption than the control group (M = 18.30). Duncan's multiple-range test revealed that the difference between the high and low fear groups was significant (p < .05). Dunnett's tests indicated that the experimental groups perceived great response efficacy than the control group.

For the bicycle helmet message, subjects in the high fear condition (M = 24.71) perceived that wearing a bicycle helmet while riding a bicycle was a significantly more effective way (F (2, 184) = 15.82; p < .001, η^2 = .15) of reducing injuries from bicycling accidents than the low fear (M = 21.68) and control group (M = 20.10). Duncan's multiple-range test revealed that the difference between the high and low fear groups was significant (p < .05). Dunnett's tests indicated that the high fear group perceived greater response efficacy than the control group. The difference between the low fear group and the control group was not statistically significant.

For the tetanus message, perceptions of response efficacy in the high fear group differed significantly (Ms = 19.53 low fear, 20.17 high fear, F (2, 177) = 4.60; p <.05, η^2 = .05) from the control group (M = 19.02). Duncan's multiple-range test revealed that the difference between the high and low fear groups was not significant (p > .05). Dunnett's tests indicated that the high fear group perceived greater response efficacy than the control

group. The difference between the low fear group and the control group was not statistically significant.

Self-efficacy. Subjects in the experimental groups for the alcohol message (Ms = 20.27 low fear, 21.39 high fear, F (2, 182) = 1.11; p >.05, η^2 = .01) did not differ significantly from the control group (M = 21.56) in their perceptions of self-efficacy. Duncan's multiple-range test revealed that the difference between the high and low fear groups was not significant ($p > .05$). Dunnett's tests indicated that the differences between the experimental groups and the control group were not statistically significant.

Subjects who read the bicycle helmet message and were in the high fear condition (M = 20.55) perceived that wearing a bicycle helmet when riding a bicycle was easy for them significantly more (F (2, 183) = 22.81; $p < .001$, η^2 = .20) than the low fear (M = 15.58) and control group (M = 15.15). Duncan's multiple-range test revealed that the difference between the high and low fear groups was significant ($p < .05$). Dunnett's tests indicated that the high fear group perceived greater self-efficacy than the control group. The difference between the low fear group and the control group was not statistically significant.

Subjects who read the tetanus message and were in the high fear condition (M = 18.32) perceived that getting a tetanus shot before infection occurred was easy for them significantly more (F (2, 177) = 3.74; $p < .05$, η^2 = .04) than the low fear (M = 17.13) and control group (M = 16.83). Duncan's multiple-range test revealed that the difference between the high and low fear groups was significant ($p < .05$). Dunnett's tests indicated that the high fear group perceived greater self-efficacy than the control group. The

difference between the low fear group and the control group was not statistically significant.

Perceived fear. Subjects who read the alcohol message and were in the high fear condition (M = 13.89) perceived significantly more fear (F (2, 183) = 14.48; $p < .001$, η^2 = .14) than the low fear (M = 8.98) and control group (M = 9.79). Duncan's multiple-range test showed that the difference between the high and low fear groups was significant ($p < .05$). Dunnett's tests indicated that the high fear group perceived greater fear than the control group. The difference between the low fear group and the control group was not statistically significant.

Subjects who read the bicycle helmet message and were in the high fear condition (M = 18.92) perceived significantly more fear (F (2, 183) = 52.16; $p < .001$, $\eta^2 = .36$) than the low fear (M = 9.74) and control group (M = 11.28). Duncan's multiple-range test revealed that the difference between the high and low fear groups was significant ($p <$ .05). Dunnett's tests indicated that the high fear group perceived great fear than the control group. The difference between the low fear group and the control group was not statistically significant.

Subjects who read the tetanus message and were in the high fear condition (M = 17.45) perceived significantly more fear (F (2, 177) = 31.42; $p < .001$, $\eta^2 = .26$) than the low fear (M = 13.38) and control group (M = 9.60). Duncan's multiple-range test revealed that the difference between the high and low fear groups was significant ($p <$ .05). Dunnett's test indicated that the experimental groups perceived great fear than the control group.

In general these data show that the inductions worked as expected. There were, however, some effects that varied from one message topic to the other. Furthermore, the measurement models for individual scales varied as a function of message topic. For these reasons it was determined that the tests of the predicted path models should be conducted by message topic. The tests of the path models for the alcohol message are presented first, followed by the bicycle helmet and tetanus messages.

Alcohol Consumption Message

To assess the drinking behavior of the sample, subjects were asked how many times and how much they drank on an average week. They were also asked how many times and how much they drank "last week." Subjects reported that they drank $\underline{M} = 2.5$ times during an average week and that they had $\underline{M} = 7.40$ drinks during an average week. Subjects also reported that they drank $\underline{M} = 2.0$ times last week and that they had $\underline{M} = 6.65$ drinks last week. These data indicate that the sample was composed mostly of persons who drank moderate to heavy amounts of alcohol. There were relatively few non-drinkers and they were distributed proportionately across cells (4-8 per cell). Subsequent analyses were run including and excluding the non-drinkers. No major differences were found between these analyses. Therefore, the non-drinkers were included in the final analyses.

To see if these data were consistent with Rogers' (1975, 1983) Protection Motivation Theory (PMT) or Witte's (1992, 1994) Extended Parallel Process Model (EPPM) scores on the perceived severity, susceptibility, response efficacy, and self-efficacy scales were divided into high and low groups using a median split. Recall that Rogers argued that when each of these four variables is high, then protection motivation is

also high and so is message acceptance or attitude change. The analysis of variance showed that when these four variables were at a high level, their effect on attitude change (Ms = 1.75 high, 1.88 low) was neither significant nor substantial (r = .00, $F(1, 60)$ = .00, $p > .05$). These results are not consistent with the PMT.

Witte (1992, 1994) contends that if perceived efficacy and perceived threat are high, then persons are likely to initiate danger control processes. Danger control processes are assumed to be cognitive and related positively to protection motivation and adaptive changes or attitude change. On the other hand, if perceived efficacy is low and perceived threat is high, persons are likely to initiate fear control processes. Fear control processes are assumed to be emotional and positively related to defensive motivation and maladaptive changes. This specific interaction was tested with attitude change serving as the dependent variable. The analysis of variance indicated that the interaction between perceived threat (severity and susceptibility) and perceived efficacy (response and self-efficacy) was neither significant nor substantial ($F(1, 58) = 1.65$, $p > .05$, $\eta^2 = .03$, r = .17). These results are not consistent with the EPPM. Table 1 presents the obtained means and standard deviations.

Table 1

Means and Standard Deviations for the Test of the EPPM Using the Alcohol Consumption Message

	High Threat	Low Threat
High Efficacy	M = 1.75 STD = 3.17 n = 4	M = 2.60 STD = 2.55 n = 15
Low Efficacy	M = 3.40 STD = 3.20 n = 10	M = 1.09 STD = 3.95 n = 33

The three way interaction predicted by the Elaboration Likelihood Model (ELM) was also tested. The Elaboration Likelihood Model (ELM) predicts that when receivers are motivated and capable (high outcome-relevant involvement) of engaging in thinking related to a particular issue, they are likely to scrutinize the quality of the arguments in a message, and therefore be less persuaded by poor arguments (i.e., faulty reasoning, bad evidence) and most persuaded by arguments that are strong. The ELM also predicts that when receivers are not motivated (i.e., low outcome-relevant involvement) to think about a particular issue, they should not evaluate the relative quality of arguments, and therefore be most persuaded by heuristic cues (i.e., source credibility).

To test the three way interaction predicted by the ELM, scores on the perceived argument quality, outcome-relevant involvement, and expertise scales were divided into high and low groups using a median split. To assess their impact on attitude change an

analysis of variance was conducted. This analysis indicated that the predicted three way interaction was not significant ($F(1, 54) = 1.68$, $p > .05$). An examination of the means found that the patterns of interactions were relatively meaningless and not consistent with the predictions of the ELM. Table 2 presents the obtained means and standard deviations.

Table 2

Means and Standard Deviations for the Test of the ELM Using the Alcohol Consumption Message

	High Credibility		Low Credibility	
	High Involve.	Low Involve.	High Involve.	Low Involve.
High Argu. Qual.	M = 2.62 STD = 5.16 n = 13	M = 2.38 STD = 4.22 n = 13	M = 3.50 STD = 3.25 n = 2	M = .83 STD = 4.08 n = 6
Low Argu. Qual.	M = 3.17 STD = 4.24 n = 6	M = -.25 STD = 4.09 n = 4	M = .73 STD = 2.87 n = 11	M = .86 STD = 3.20 n = 7

An examination of the correlation matrix generated to test the predicted models showed that all of the models had some deficiencies (this correlation matrix is provided in Appendix A). In other words, none of the predicted models fit the data well. For instance, the relationship between fear arousing content and discrepancy was neither substantial nor significant ($r = .08$, $F(1, 56) = .32$, $p > .05$). Thus, models that posited that the fear arousing content-attitude change relationship was mediated by discrepancy were

rejected. Likewise the relationship between fear arousing content and outcome-relevant involvement was neither substantial nor significant (r = .08, $F(1, 61)$ = .43, p > .05 when the posttest was used, and r = .15, $F(1, 61)$ = 1.36, p > .05 when the change scale was used). For this reason, models that posited that the fear arousing content-attitude change relationship was mediated by outcome-relevant involvement were rejected. Table 3 displays the descriptive statistics for the dependent measures of the alcohol consumption message.

After the predicted models failed, the correlation matrix was explored to find and test other theoretically meaningful causal models. The model that fit the data best was a model that used perceived fear and perceived argument quality as independent mediators of the relationship between fear arousing content and attitude change. An inspection of scatterplots produced no evidence of nonlinearity, and no sign of extreme outliers. Subsequent analyses showed no evidence of nonadditivity. The distribution of each measure approximated the normal distribution closely. The resulting model, with path coefficients, is presented in Figure 10. The path coefficients corrected for attenuation due to error of measurement are in parentheses.

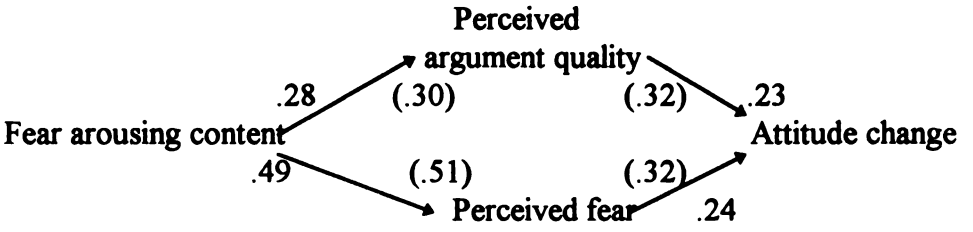

Figure 10. The Perceived Fear and Perceived Argument Quality Independence Model for the Alcohol Consumption Message.

The fit of the model was assessed in two ways. First, predicted values were generated from both correlations not constrained to equal their obtained value, the perceived argument quality-perceived fear correlation and fear arousing content-attitude change correlation, to see if the predicted values were within sampling error of those obtained. Both residuals (the difference between the obtained and the predicted correlations) were small, .02 and .14 respectively, and within sampling error of zero. Second, chi-square was employed as a global measure of fit. This model yielded a small and insignificant chi-square ($\underline{X}^2(2) = .61$, $\underline{p} > .05$ and $\underline{X}^2 (2) = .34$, $\underline{p} > .05$ when the correlations corrected for attenuation due to error of measurement were used). Both methods lead to the same conclusion; namely, that the data are consistent with the model. The path from fear arousing content to perceived argument quality was significant $\underline{t}(60) = 2.19$, $\underline{p} < .05$, and so was the path from fear arousing content to perceived fear $\underline{t}(60) = 4.05$, $\underline{p} < .001$.

A multiple regression analysis regressing attitude change onto perceived argument quality and perceived fear showed that both variables impacted attitude change ($\underline{R} = .36$, $\underline{F}(2, 58) = 4.35$, $\underline{p} < .05$ and $\underline{R} = .50$ when corrected for attenuation due to error of measurement). The effect for perceived fear was substantial and significant (the standardized regression coefficient, $\underline{B} = .24$, $\underline{t}(58) = 1.96$, $\underline{p} = .05$), and the effect for perceived argument quality was substantial and approached significance (the standardized regression coefficient, $\underline{B} = .23$, $\underline{t}(58) = 1.86$, $\underline{p} = .07$). The correlations among the variables in this model are presented in Table 4 along with the reliabilities, means, and

Table 3

Descriptive Statistics for the Dependent Variables of the Alcohol Consumption Message

VARIABLE	CONTROL GROUP			LOW FEAR			HIGH FEAR			N
	M	STD	n	M	STD	n	M	STD	n	
Perceived Fear	9.79	5.11	61	8.98	5.11	62	13.89	6.11	63	186
Discrepancy	-15.88	40.46	59	-14.14	22.56	58	-24.48	42.50	62	179
Psychological Discrepancy	60.07	56.39	61	70.54	59.70	61	60.56	67.57	63	185
Impression Involvement Posttest	17.95	5.46	59	17.67	5.17	63	17.25	5.16	64	186
Impression Involvement Change	-.63	3.08	30	-1.06	3.10	31	.25	3.05	32	93
Outcome Involvement Posttest	9.80	5.11	61	10.59	4.93	63	11.55	5.26	64	188
Outcome Involvement Change	.00	2.23	30	-.06	3.43	31	1.31	5.63	32	93
Value Involvement Posttest	15.20	7.14	60	15.73	5.77	63	17.69	6.71	64	187
Value Involvement Change	-.27	3.67	30	-.26	3.37	31	2.91	5.29	32	93
Perceived Argument Quality	24.92	4.45	61	25.95	5.17	62	28.38	5.14	63	186
Expertise	40.59	6.26	61	40.75	8.47	61	43.55	4.89	64	186
Trust	39.85	6.57	61	38.69	9.44	62	42.17	6.23	63	186
Response Efficacy	18.30	6.47	61	20.54	5.81	63	21.97	5.40	64	188
Self-Efficacy	21.56	4.61	59	20.27	5.56	62	21.39	5.33	64	185
Severity	24.59	3.48	61	24.24	3.66	63	26.34	2.61	64	188
Susceptibility	13.72	5.41	61	11.44	5.09	63	11.89	5.39	64	188
Attitude Posttest	18.84	6.20	61	21.08	5.06	61	21.88	5.01	64	186
Attitude Change	-.07	1.86	30	.55	2.61	31	3.00	4.25	32	93

standard deviations for the corresponding scales. The corrected correlations are reported on the upper triangle of the matrix.

Table 4

Correlations and Descriptive Statistics for the Perceived Fear and Perceived Argument Quality Independence Model for the Alcohol Consumption Message

	FEAR	PFEAR	ARGUQ	ATTCHN	ALPHA	MEAN	STD
FEAR	1.00	.51	.30	.42	1.00	--	--
PFEAR	.49	1.00	.18	.39	.92	12.30	6.45
ARGUQ	.28	.16	1.00	.38	.90	27.67	4.77
ATTCHN	.32	.28	.27	1.00	.57	1.79	3.72

Bicycle Helmet Message

To determine the extent to which the sample used bicycle helmets, subjects were asked, "What percentage of the time do you actually wear a bicycle helmet when riding a bicycle?" Response options ranged from 0 to 100. Subjects reported that they wore a bicycle helmet $\underline{M} = 3.23\%$ of the time and 87.2% of the sample reported that they wore a bicycle helmet 0% of the time. These data indicate that the sample was composed mostly of persons who did not wear a bicycle helmet when riding a bicycle. There were relatively few subjects who reported that they wore a bicycle helmet 100% of the time (1.6% of the sample). Subsequent analyses were run including and excluding subjects who reported that they wore helmets 100% of the time. No major differences were found between these

analyses. Therefore, those persons who reported that they wore helmets 100% of the time were included in the final analyses.

To see if these data were consistent with Rogers' (1975, 1983) Protection Motivation Theory (PMT) or Witte's (1992, 1994) Extended Parallel Process Model (EPPM) scores on the perceived severity, susceptibility, response efficacy, and self-efficacy scales were divided into high and low groups using a median split. When these four variables were at a high level, their effect on attitude change (Ms = 4 .64 high, 4.25 low) was neither significant nor substantial (r = .05, $F(1, 60)$ = .13, $p > .05$). The interaction between perceived threat (severity and susceptibility) and perceived efficacy (response and self-efficacy) was neither significant nor substantial ($F(1, 58)$ = .67, $p >$ .05, η^2 = .01, r = .10). As explained in the previous section, the former results are not consistent with PMT, and the latter are not consistent with the EPPM. Table 5 presents the obtained means and standard deviations.

As in previous analyses, outcome-relevant involvement, perceived argument quality, and expertise, did not impact attitude change as predicted by the Elaboration Likelihood Model (ELM). Once again, scores on the perceived argument quality, outcome-relevant involvement, and expertise scales were divided into high and low groups using a median split. To assess their impact on attitude change an analysis of variance was conducted.

Table 5

Means and Standard Deviations for the Test of the EPPM Using the Bicycle Helmet Message

	High Threat	Low Threat
High Efficacy	M = 4.64 STD = 3.32 n = 14	M = 6.25 STD = 3.79 n = 12
Low Efficacy	M = 4.00 STD = 2.00 n = 3	M = 3.55 STD = 3.55 n = 33

This analysis indicated that the predicted three way interaction was not significant ($F(1, 54) = 2.26$, $p > .05$). An examination of the means found that the patterns of interactions were relatively meaningless and not consistent with the predictions of the ELM. Table 6 presents the obtained means and standard deviations.

An examination of the correlation matrix generated to test the predicted models showed once again that all of the models had some deficiencies (this correlation matrix is provided in Appendix B). For example, the relationship between fear arousing content and discrepancy was neither substantial nor significant ($r = .02$, $F(1, 60) = .02$, $p > .05$). Thus, models that posited that the fear arousing content-attitude change relationship was mediated by discrepancy were rejected.

Table 6

Means and Standard Deviations for the Test of the ELM Using the Bicycle Helmet Message

	High Credibility		Low Credibility	
	High Involve.	Low Involve.	High Involve.	Low Involve.
High Argu. Qual.	M = 4.30 STD = 4.63 n = 20	M = 4.70 STD = 3.67 n = 10	M = 5.22 STD = 5.82 n = 9	M = 2.50 STD = 4.19 n = 4
Low Argu. Qual.	M = 4.00 STD = 2.12 n = 2	M = -.25 STD = 5.00 n = 4	M = .83 STD = 2.43 n = 6	M = 3.57 STD = 5.88 n = 7

In addition, the relationship between fear arousing content and outcome-relevant involvement was neither substantial nor significant ($r = .16$, $F(1, 60) = 1.48$, $p > .05$ when the posttest was used, and $r = .16$, $F(1, 60) = 1.56$, $p > .05$ when the change scale was used). Therefore, models that posited that the fear arousing content-attitude change relationship was mediated by outcome-relevant were rejected. Table 7 displays the descriptive statistics of the dependent measures for the bicycle helmet message.

After the predicted models failed, the correlation matrix was explored to find and test other theoretically meaningful causal models. The model that fit the data best was a model that used perceived argument quality as a mediator of the relationship between fear arousing content and attitude change. An inspection of scatterplots produced no evidence of nonlinearity, and no sign of extreme outliers. Subsequent analyses showed no evidence

of nonadditivity. The distribution of each measure approximated the normal distribution closely. The resulting model, with path coefficients is presented in Figure 11. The corrected path coefficients are in parentheses.

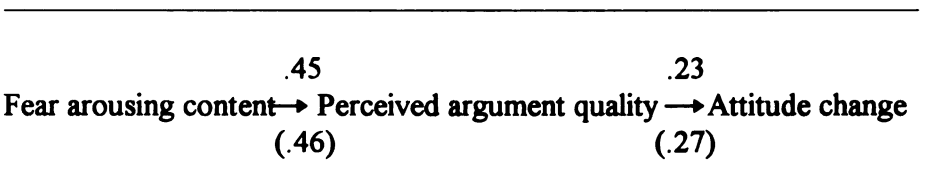

Figure 11. The Perceived Argument Quality Model for the Bicycle Helmet Message.

The fit of the model was assessed in two ways. First, a predicted value was generated from the correlation not constrained to equal the obtained value, the fear arousing content-attitude change correlation, to see if the predicted value was within sampling error of the obtained. The residual (the difference between the obtained and the predicted correlation) was small, .11, and within sampling error of zero. Second, chi-square was employed as a global measure of fit. This model yielded a small and insignificant chi-square ($\underline{X}^2(1) = .30$, $\underline{p} > .05$ and $\underline{X}^2 (1) = .39$, $\underline{p} > .05$ when corrected correlations were used), indicating that the model fits the data.

Table 7

Descriptive Statistics for the Dependent Variables of the Bicycle Helmet Message

VARIABLE	CONTROL GROUP			LOW FEAR			HIGH FEAR			N
	M	STD	n	M	STD	n	M	STD	n	
Perceived Fear	11.28	5.17	61	9.74	5.04	62	18.92	5.88	63	186
Discrepancy	170.13	97.96	62	201.26	103.70	62	188.43	115.62	63	187
Psychological Discrepancy	112.31	69.04	62	335.77	1556.75	62	86.81	79.23	62	186
Impression Involvement Posttest	10.55	3.84	62	9.61	4.10	62	11.87	4.38	63	187
Impression Involvement Change	.30	2.85	30	.00	3.33	31	2.61	3.32	31	92
Outcome Involvement Posttest	15.98	7.06	62	15.94	6.61	62	16.92	6.28	63	187
Outcome Involvement Change	.00	2.35	30	1.64	4.74	31	3.19	4.94	31	92
Value Involvement Posttest	10.06	5.23	62	10.53	5.40	62	13.65	5.68	63	187
Value Involvement Change	-1.57	2.22	30	.58	5.03	31	4.58	5.66	31	92
Perceived Argument Quality	23.98	5.70	61	22.95	6.73	62	29.18	4.45	62	185
Expertise	34.49	5.10	61	34.48	6.46	62	35.92	5.25	63	186
Trust	34.37	5.47	60	35.26	6.35	62	36.18	6.09	62	184
Response Efficacy	20.10	5.43	62	21.68	5.00	62	24.71	3.33	63	187
Self-Efficacy	15.15	5.58	62	15.58	4.67	62	20.55	4.53	62	185
Severity	20.87	4.65	62	18.15	5.16	62	24.41	3.96	63	187
Susceptibility	19.39	6.06	62	17.65	6.08	62	17.46	6.14	63	187
Attitude Posttest	27.84	5.88	61	28.37	5.59	62	32.67	3.66	63	186
Attitude Change	.40	2.77	30	2.52	4.47	31	4.81	5.87	31	92

The path from fear arousing content to attitude change was significant $t(60) = 3.95$, $p < .001$, and the path from perceived argument quality to attitude change approached significance $t(60) = 1.86$, $p = .07$. The correlations among the variables in this model are presented in Table 8 along with the reliabilities, means, and standard deviations for the corresponding scales. The corrected correlations are reported on the upper triangle of the matrix.

Table 8

Correlations and Descriptive Statistics for the Perceived Argument Quality Model for the Bicycle Helmet Message

	FEAR	ARGUQ	ATTCHN	ALPHA	MEAN	STD
FEAR	1.00	.46	.25	1.00	--	--
ARGUQ	.45	1.00	.27	.94	25.56	6.19
ATTCHN	.22	.23	1.00	.78	3.66	5.33

Tetanus Message

To see if these data were consistent with Rogers' (1975, 1983) Protection Motivation Theory (PMT) or Witte's (1992, 1994) Extended Parallel Process Model (EPPM) scores on the perceived severity, susceptibility, response efficacy, and self-efficacy scales were divided into high and low groups using a median split. When these four variables were at a high level, their effect on attitude change (Ms = 1 .25 high, 1.79 low) was neither significant nor substantial ($r = .06$, $F(1, 57) = .20$, $p > .05$). The

interaction between perceived threat (severity and susceptibility) and perceived efficacy (response and self-efficacy) was neither significant nor substantial ($F(1, 55) = .06$, $p > .05$, $r = .03$). As explained in the analyses for the alcohol message, the former results are not consistent with PMT, and the latter are not consistent with the EPPM. Table 9 presents the obtained means and standard deviations.

Table 9

Means and Standard Deviations for the Test of the EPPM Using the Tetanus Message

	High Threat	Low Threat
High Efficacy	M = 1.25 STD = 3.01 n = 12	M = 1.69 STD = 1.30 n = 13
Low Efficacy	M = 1.11 STD = 4.39 n = 9	M = 2.08 STD = 4.36 n = 25

Outcome-relevant involvement, perceived argument quality, and expertise, did not impact attitude change as predicted by the Elaboration Likelihood Model (ELM). Scores on the perceived argument quality, outcome-relevant involvement, and expertise scales were divided into high and low groups using a median split. To assess their impact on attitude change an analysis of variance was conducted. This analysis indicated that the predicted three way interaction was not significant ($F(1, 50) = .18$, $p > .05$). An

examination of the means found that the patterns of interactions were relatively meaningless and not consistent with the predictions of the ELM. Table 10 presents the obtained means and standard deviations.

Table 10

Means and Standard Deviations for the Test of the ELM Using the Tetanus Message

	High Credibility		Low Credibility	
	High Involve.	Low Involve.	High Involve.	Low Involve.
High Argu. Qual.	M = .69 STD = 2.46 n = 13	M = 1.82 STD = 4.42 n = 11	M = .00 STD = .71 n = 5	M = 1.33 STD = 2.3 n = 3
Low Argu. Qual.	M = .00 STD = .00 n = 2	M = .40 STD = 1.14 n = 5	M = 1.75 STD = 2.43 n = 8	M = 4.36 STD = 5.78 n = 11

An examination of the correlation matrix generated to test the predicted models showed once again that all of the models had some deficiencies (this correlation matrix is provided in Appendix C). For example, the relationship between fear arousing content and discrepancy was neither substantial nor significant ($r = .08$, $F(1, 58) = .38$, $p > .05$). Therefore, models that posited that the fear arousing content-attitude change relationship was mediated by discrepancy were rejected. Furthermore, the relationship between fear arousing content and outcome-relevant involvement was neither substantial nor significant

(r = .04, $F(1, 58)$ = .11, p > .05 when the posttest was used, and r = .18, $F(1, 58)$ = 2.09, p > .05 when the change scale was used). Thus, models that posited that the fear arousing content-attitude change relationship was mediated by outcome-relevant involvement were rejected. Table 11 presents the descriptive statistics for the dependent measures of the tetanus message.

After the predicted models failed, the correlation matrix was explored to find and test other theoretically meaningful causal models. To see if the tetanus message data were consistent with the data for the other topics, a path model was tested using perceived fear and perceived argument quality as independent mediators of the relationship between fear arousing content and attitude change. An inspection of scatterplots produced no evidence of nonlinearity. Two outliers were detected and deleted from subsequent analyses. These analyses showed no evidence of nonadditivity. The distribution of each measure approximated the normal distribution closely. The resulting model, with path coefficients, is presented in Figure 12. The corrected path coefficients are in parentheses.

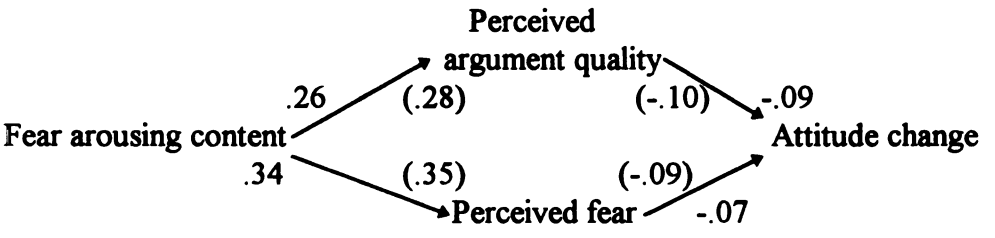

Figure 12. The Perceived Fear and Perceived Argument Quality Independence Model for the Tetanus Message.

Table 11

Descriptive Statistics for the Dependent Variables of the Tetanus Message

VARIABLE	CONTROL GROUP			LOW FEAR			HIGH FEAR			N
	M	STD	n	M	STD	n	M	STD	n	
Perceived Fear	9.60	4.75	61	13.38	5.62	60	17.45	5.85	60	180
Discrepancy	78.95	91.78	60	107.98	131.95	60	102.23	129.91	60	180
Psychological Discrepancy	50.31	51.42	60	61.20	58.85	60	50.67	57.03	60	180
Impression Involvement Posttest	9.92	4.18	60	10.57	4.86	60	11.18	4.19	60	180
Impression Involvement Change	-.53	3.81	30	2.07	4.66	30	1.30	3.62	30	90
Outcome Involvement Posttest	19.08	5.53	60	22.13	4.55	60	23.02	4.19	60	180
Outcome Involvement Change	-.83	3.59	30	2.50	4.93	30	4.10	3.52	30	90
Value Involvement Posttest	14.00	6.21	60	17.18	5.74	60	18.98	6.24	60	180
Value Involvement Change	-1.33	3.13	30	2.47	5.20	30	5.20	6.53	30	90
Perceived Argument Quality	24.58	6.37	60	27.87	5.57	60	30.55	3.99	60	180
Expertise	34.88	4.84	59	37.46	6.39	59	39.12	4.14	60	178
Trust	34.93	5.13	59	36.59	5.73	59	37.83	5.13	60	178
Response Efficacy	19.02	2.47	60	19.53	2.24	60	20.17	1.37	60	180
Self-Efficacy	16.83	3.24	60	17.13	2.90	60	18.32	3.27	60	180
Severity	14.63	4.17	60	17.67	3.47	60	19.98	2.27	60	180
Susceptibility	7.38	3.11	60	7.12	3.46	60	9.63	5.46	60	180
Attitude Posttest	33.03	2.86	60	32.78	3.45	60	34.10	2.21	60	180
Attitude Change	.63	3.17	30	2.03	4.48	29	1.33	2.72	30	89

The fit of the model was assessed in two ways. First, predicted values were generated from both correlations not constrained to equal their obtained value, the perceived argument quality-perceived fear correlation and fear arousing content-attitude change correlation, to see if the predicted values were within sampling error of those obtained. Both residuals (the difference between the obtained and the predicted correlations) were small, .10 and -.05 respectively, and within sampling error of zero. Second, chi-square was employed as a global measure of fit. This model yielded a small and insignificant chi-square ($\underline{X}^2(2) = .29$, $\underline{p} > .05$ and $\underline{X}^2 (2) = .37$, $\underline{p} > .05$ when corrected correlations were used). The path from fear arousing content to perceived argument quality was significant $\underline{t}(58) = 2.09$, $\underline{p} < 05$, and so was the path from fear arousing content to perceived fear $\underline{t}(58) = 2.79$, $\underline{p} < .01$. A multiple regression analysis regressing attitude change onto perceived argument quality and perceived fear showed that these variables did not impact attitude change significantly or substantially ($\underline{R} = .12$, $\underline{F}(2, 56) = .43$, $\underline{p} > .05$ and $\underline{R} = .15$ when corrected for attenuation due to error of measurement). The effect for perceived fear was neither significant nor substantial ($\underline{B} = -.07$, $\underline{t}(56) = -.55$, $\underline{p} > .05$), and the effect for perceived argument quality was neither significant nor substantial ($\underline{B} = -.09$, $\underline{t}(56) = -.64$, $\underline{p} > .05$). Since the size of these path coefficients was extremely small and insignificant, the model was rejected. No other model fit these data.

An examination of the distribution of scores on the attitude pretest showed that the sample had a positive attitude toward the position advocated in the message <u>before</u> the induction. For example, 50% of the subjects in the high fear condition reported that they had the most positive attitude possible (scale maximum = 35) toward getting a tetanus

shot before infection occurred. Similarly, 33.3% of the subjects in the low fear condition reported that they had the most positive attitude possible (scale maximum = 35) toward getting a tetanus shot before infection occurred. Since most of the subjects already had the most positive attitude possible on the scale, the induction had little impact on attitude change. The correlations among the variables used in the path model are presented in Table 12 along with the reliabilities, means, and standard deviations for the corresponding scales. The corrected correlations are reported on the upper triangle of the matrix.

Table 12

Correlations and Descriptive Statistics for the Perceived Fear and Perceived Argument Quality Independence Model for the Tetanus Message

	FEAR	PFEAR	ARGUQ	ATTCHN	ALPHA	MEAN	STD
FEAR	1.00	.35	.28	-.11	1.00	--	--
PFEAR	.34	1.00	.21	-.11	.92	15.75	6.30
ARGUQ	.26	.19	1.00	-.12	.88	29.08	4.13
ATTCHN	-.10	-.09	-.10	1.00	.79	1.68	3.67

DISCUSSION

Overview

This study examined the impact of potential confounds in the relationship between fear arousing persuasive messages and attitude change. A series of causal models were developed and tested. The first set of models posited that discrepancy or outcome-relevant involvement mediated the relationship between fear arousing content and attitude change. These models were incorporated into three larger models that predicted that discrepancy, outcome-relevant involvement, and perceived fear mediated the relationship between fear arousing content and attitude change. The data were inconsistent with the predicted models. These data were also inconsistent with Protection Motivation Theory (PMT), the Extended Parallel Process Model (EPPM), and the Elaboration Likelihood Model (ELM). A series of similar causal models were found to fit the data, however. In these models perceived fear and perceived argument quality were examined as mediators of the relationship between fear arousing content and attitude change. The results showed that the structure of the models varied as a function of message topic. Both perceived argument quality and perceived fear mediated the effect of fear arousing content on attitude change for the alcohol and tetanus messages. This model was labeled the Perceived Argument Quality and Perceived Fear Independence Model. Perceived

argument quality mediated the effect of fear arousing content on attitude change for the bicycle helmet message. This model was called the Perceived Argument Quality Model.

Theoretical Implications

The Perceived Argument Quality and Perceived Fear Independence Model posits that fear arousing content produces greater perceived fear and perceived argument quality which, in turn, increase attitude change. Put another way, the Independence Model posits that both perceived fear and perceived argument quality mediate the relationship between fear arousing content and attitude change. The Perceived Argument Quality Model posits that fear arousing content produces greater perceived argument quality which, in turn, increases attitude change. In other words, this model posits that the relationship between fear arousing content and attitude change is mediated solely by perceived argument quality. The Perceived Argument Quality Model represents a cognitive route to attitude change. The Perceived Argument Quality and Perceived Fear Independence Model represents a cognitive and emotional route to attitude change.

The emotional route. The fear arousing content, perceived fear, and attitude change causal chain illustrates the emotional route to attitude change. As other scholars have argued (Burgoon, in press), the causal relationship between fear arousing content, perceived fear, and attitude change can be explained most parsimoniously by employing drive-reduction theory (Higbee, 1970; Baron & Bryne, 1977). According to this model, fear arousing content increases negative arousal (perceived fear). This arousal decreases when an effective way of reducing it is presented (message acceptance). Thus, arousal reduction is reinforcing, and likely to increase attitude change (Baron & Bryne, 1977).

In this study fear arousing content had a substantial effect on perceived fear for all message topics. The subsequent effect of perceived fear on attitude change depended on the message topic, however. Recall that for the bicycle helmet message, perceived fear did not mediate the relationship between fear arousing content and attitude change. When perceived fear did impact attitude change, the effect was positive. In other words, there was no evidence of a defensive avoidance effect. This finding is consistent with several theories which predict that fear and persuasion are related positively. These data are not consistent with the presence of a fear control process. There is no evidence that fear arousing content induced fear control processes as described by Leventhal (1970), or Witte (1992, 1994). Contrary to recent speculation by Dillard (1994), these data do suggest that cognition may be more important than emotion in explaining the relationship between fear arousing content and attitude change because most of the models had a cognitive component. This cognitive route to attitude change posits that highly fearful messages are perceived as more compelling than messages low in fear, and in turn, increase attitude change.

The cognitive route. Boster and Mongeau (1984) argue that the relationship between fear arousing content and attitude change may be confounded by message discrepancy. These data are not consistent with the discrepancy mediation hypothesis, but they are, however, consistent with the hypothesis that the fear arousing content-attitude change relationship is confounded. Specifically, these data indicate that highly fearful messages induce attitude change because they are seen as more compelling than those messages low in fear. Put another way, these data show that perceived argument quality

mediates the relationship between fear arousing content and attitude change. This causal chain suggests a cognitive or information-processing route to persuasion.

The causal relationship between fear arousing content, perceived argument quality, and attitude change can be explained by the effect of intense language on attitudes. Burgoon (1989) argues that fear arousing persuasive messages may be conceptualized as a special case of intense language. Researchers interested in the effect of intense messages on attitude change argue that language high in intensity is vivid and specific (Hamilton, et al., 1990; Hamilton & Stewart, 1993). These characteristics make intense messages appear more informative than messages low in intensity. In other words, vividness and specificity should clarify the position advocated in a message, and lead to greater argument quality. The clarity associated with intense messages should then lead to greater retention of the new information and attitude change. Consistent with this reasoning, Hamilton and Stewart (1993) show that message intensity increases attitude change by increasing argument quality (p. 244).

In this study fear arousing content had a substantial effect on perceived argument quality for all message topics. The subsequent effect of perceived argument quality on attitude change was substantial for the alcohol and bicycle helmet messages. The effect of perceived argument quality on attitude change for the tetanus message was trivial because of the relatively high pretest attitude judgments reported by subjects. In other words, subjects could not adopt more positive attitudes because their initial attitudes were substantially positive. For fear arousing message topics where initial attitudes are not

substantially positive, one would expect perceived argument quality to impact attitude change substantially.

The perceived argument quality effect on attitude change has important implications for the literature on fear arousing persuasive messages. Two of the messages (alcohol and tetanus) in this study were used in published research. Thus, it is likely that the perceived argument quality confound is present in other comparable messages. For this reason, it is important to consider the potential confounding effect of perceived argument quality when interpreting the results of previous literature. It is unlikely, however, that all low fear messages are less compelling than high fear messages. In other words, it is possible that other low fear messages may present more compelling arguments than the ones used in this study. Nevertheless, the perceived argument quality confound may be eliminated in future studies by creating low and high fear messages that are equally compelling. Furthermore, perceived argument quality should be measured to index any potential confounding effects. In this way, one can benefit from using entire samples instead of deleting large portions that do not meet certain criteria.

Methodological Implications

Some of the confusion in the literature on fear arousing persuasive messages may be attributed to the use of posttest only designs. It is clear from the results of the study that posttest scores are misleading because subjects respond differently on the pretest even though they are assigned randomly to conditions, or because they are already at the upper bound of the scale on the pretest. In sum, random assignment does not guarantee that the comparability of subjects. For this reason it is recommended that subsequent studies

compute and examine change scores to determine if subjects change their attitudes substantially or not at all. Of course, one problem is that change scores tend to be less reliable than posttest scores. This fact implies the importance of careful pretesting to obtain change scores with satisfactory reliability.

One common threat to the validity of pretest-posttest designs is that the pretest may sensitize subjects to the nature of the experiment. Because the posttest scores of subjects receiving and not receiving a pretest differed little, there is no evidence that this factor threatened the validity of the data presented in this study.

Summary

The purpose of this investigation was to explore potential confounds in fear arousing persuasive messages. It was argued that these confounds moderate or mediate the relationship between fear arousing messages and attitude change. A 3 X 3 X 2 Solomon four-group design was employed. There were three message topics (bicycle helmets, tetanus, and alcohol consumption), three fear conditions (high, low, and control), and the presence or absence of a pretest. Subjects were assigned to conditions randomly with the constraint that comparable numbers of subjects were in each cell. A series of causal models were devised and tested. Path analyses indicated that perceived fear and perceived argument quality mediated the relationship between fear arousing content and attitude change. The exact structure of the path models varied as a function of message topic. The implications of the findings and directions for future research were discussed.

APPENDIX A

CORRELATIONS AMONG THE VARIABLES FOR THE ALCOHOL CONSUMPTION MESSAGE

	FEAR	PFEAR	DISCR	PSYDIS	IMPPOST	IMPCHN
FEAR	1.0000	.4867	-.0725	-.1005	.1955	.3511
PFEAR	.4867	1.0000	.0382	-.1164	-.0461	.2903
DISCR	-.0725	.0382	1.0000	-.1122	.1626	-.0635
PSYDIS	-.1005	-.1164	-.1122	1.0000	-.2232	-.0859
IMPPOST	.1955	-.0461	.1626	-.2232	1.0000	.2898
IMPCHN	.3511	.2903	-.0635	-.0859	.2898	1.0000
OUTPOST	-.0208	.2140	-.2250	.1400	-.0408	-.0209
OUTCHN	.0785	.0339	-.2488	.1283	.0163	.0285
VALPOST	.2090	.0623	.2318	-.1935	.2470	-.2283
VALCHN	.3418	.3608	-.0765	-.1340	-.0368	.2422
ARGUQ	.2803	.1212	-.0271	-.2298	.1649	-.0413
EXPERT	.1719	-.1519	.0464	-.1525	.0304	-.1940
TRUST	.0145	-.1176	-.0005	-.1715	.0923	-.2177
REFF	.0250	-.1624	.0743	.0522	-.0465	-.0600
SEFF	.0829	-.2048	.2409	-.2647	.4544	-.0547
SEVERE	.4411	.1500	-.0552	-.0177	.1364	-.0185
SUSCEP	.0962	.3386	.0127	-.0949	-.2085	-.0247
ATTPOST	-.1083	-.2292	.1356	-.0904	.1805	-.2185
ATTCHN	.2452	.2999	-.2253	-.1389	-.0596	.1238

	OUTPOST	OUTCHN	VALPOST	VALCHN	ARGUQ	EXPERT
FEAR	-.0208	.0785	.2090	.3418	.2803	.1719
PFEAR	.2140	.0339	.0623	.3608	.1212	-.1519
DISCR	-.2250	-.2488	.2318	-.0765	-.0271	.0464
PSYDIS	.1400	.1283	-.1935	-.1340	-.2298	-.1525
IMPPOST	-.0408	.0163	.2470	-.0368	.1649	.0304
IMPCHN	-.0209	.0285	-.2283	.2422	-.0413	-.1940
OUTPOST	1.0000	.5546	-.0297	.2050	-.0570	-.0384
OUTCHN	.5546	1.0000	.1820	.2494	.0753	.1000
VALPOST	-.0297	.1820	1.0000	.2184	.4002	.2855
VALCHN	.2050	.2494	.2184	1.0000	.3564	.1110
ARGUQ	-.0570	.0753	.4002	.3564	1.0000	.5676
EXPERT	-.0384	.1000	.2855	.1110	.5676	1.0000
TRUST	.1292	.1992	.1331	.1291	.4289	.7388
REFF	-.0573	.2023	.2394	-.0089	.3465	.4486
SEFF	-.3019	.0282	.5962	.0242	.2770	.2911
SEVERE	.1867	.1227	.1980	.1516	.3417	.3762
SUSCEP	.3761	-.0405	.0929	.2349	-.0399	-.1410
ATTPOST	.1318	.3209	.5189	.0098	.3342	.3585
ATTCHN	.1566	.3305	.1379	.4817	.2356	.2293

	TRUST	REFF	SEFF	SEVERE	SUSCEP	ATTPOST
FEAR	.0145	.0250	.0829	.4411	.0962	-.1083
PFEAR	-.1176	-.1624	-.2048	.1500	.3386	-.2292
DISCR	-.0005	.0743	.2409	-.0552	.0127	.1356
PSYDIS	-.1715	.0522	-.2647	-.0177	-.0949	-.0904
IMPPOST	.0923	-.0465	.4544	.1364	-.2085	.1805
IMPCHN	-.2177	-.0600	-.0547	-.0185	-.0247	-.2185
OUTPOST	.1292	-.0573	-.3019	.1867	.3761	.1318
OUTCHN	.1992	.2023	.0282	.1227	-.0405	.3209
VALPOST	.1331	.2394	.5962	.1980	.0929	.5189
VALCHN	.1291	-.0089	.0242	.1516	.2349	.0098
ARGUQ	.4289	.3465	.2770	.3417	-.0399	.3342
EXPERT	.7388	.4486	.2911	.3762	-.1410	.3585
TRUST	1.0000	.3241	.2015	.2194	-.0599	.2797
REFF	.3241	1.0000	.2603	.2241	-.2332	.4536
SEFF	.2015	.2603	1.0000	.1457	-.3302	.3665
SEVERE	.2194	.2241	.1457	1.0000	.0030	.0749
SUSCEP	-.0599	-.2332	-.3302	.0030	1.0000	-.1954
ATTPOST	.2797	.4536	.3665	.0749	-.1954	1.0000
ATTCHN	.1492	.1689	.0448	.2250	.0416	.2897

	ATTCHN
FEAR	.2452
PFEAR	.2999
DISCR	-.2253
PSYDIS	-.1389
IMPPOST	-.0596
IMPCHN	.1238
OUTPOST	.1566
OUTCHN	.3305
VALPOST	.1379
VALCHN	.4817
ARGUQ	.2356
EXPERT	.2293
TRUST	.1492
REFF	.1689
SEFF	.0448
SEVERE	.2250
SUSCEP	.0416
ATTPOST	.2897
ATTCHN	1.0000

N of cases: 55

APPENDIX B

CORRELATIONS AMONG THE VARIABLES FOR THE BICYCLE HELMET MESSAGE

	FEAR	PFEAR	DISCR	PSYDIS	IMPPOST	IMPCHN
FEAR	1.0000	.6489	-.0180	-.0870	.1327	.3709
PFEAR	.6489	1.0000	-.0968	-.3920	.2652	.2312
DISCR	-.0180	-.0968	1.0000	.3845	-.1216	.0849
PSYDIS	-.0870	-.3920	.3845	1.0000	-.2731	-.1099
IMPPOST	.1327	.2652	-.1216	-.2731	1.0000	.4808
IMPCHN	.3709	.2312	.0849	-.1099	.4808	1.0000
OUTPOST	.1553	.2949	-.3004	-.2408	.4111	.2837
OUTCHN	.1605	.0887	.0989	.0915	.2127	.3028
VALPOST	.3069	.5811	-.0549	-.3219	.3675	.2386
VALCHN	.3551	.4606	.0547	-.1252	.2072	.3195
ARGUQ	.4547	.5668	-.1723	-.3370	.3619	.1188
EXPERT	.1809	.2719	-.2293	-.2932	.0933	.0897
TRUST	-.0027	.3171	-.2514	-.4610	.1432	-.0461
REFF	.3370	.3509	-.1865	-.2955	.0629	.0726
SEFF	.5750	.4930	-.2935	-.3350	.2304	.2259
SEVERE	.5709	.5546	-.1961	-.4686	.1974	.2928
SUSCEP	.0366	.1079	-.3709	-.1779	.0050	-.1066
ATTPOST	.3901	.5159	-.2891	-.4746	.2532	.1792
ATTCHN	.2178	.1104	.2654	-.1220	.1264	.1998

	OUTPOST	OUTCHN	VALPOST	VALCHN	ARGUQ	EXPERT
FEAR	.1553	.1605	.3069	.3551	.4547	.1809
PFEAR	.2949	.0887	.5811	.4606	.5668	.2719
DISCR	-.3004	.0989	-.0549	.0547	-.1723	-.2293
PSYDIS	-.2408	.0915	-.3219	-.1252	-.3370	-.2932
IMPPOST	.4111	.2127	.3675	.2072	.3619	.0933
IMPCHN	.2837	.3028	.2386	.3195	.1188	.0897
OUTPOST	1.0000	.3981	.4519	.1709	.3760	.2852
OUTCHN	.3981	1.0000	.1388	.3620	.2796	.2082
VALPOST	.4519	.1388	1.0000	.7270	.5439	.2518
VALCHN	.1709	.3620	.7270	1.0000	.4809	.2729
ARGUQ	.3760	.2796	.5439	.4809	1.0000	.6161
EXPERT	.2852	.2082	.2518	.2729	.6161	1.0000
TRUST	.2606	.0693	.3004	.2183	.5271	.6656
REFF	.1266	.2655	.1233	.2846	.5742	.4307
SEFF	.3874	.3923	.3569	.4018	.6434	.3694
SEVERE	.2571	.1160	.2525	.2776	.5070	.3561
SUSCEP	.3893	-.1945	-.0450	-.2534	.0481	-.0673
ATTPOST	.4324	.2723	.2984	.2646	.6092	.4217
ATTCHN	-.0031	.4043	.0926	.2953	.2339	.1844

	TRUST	REFF	SEFF	SEVERE	SUSCEP	ATTPOST
FEAR	-.0027	.3370	.5750	.5709	.0366	.3901
PFEAR	.3171	.3509	.4930	.5546	.1079	.5159
DISCR	-.2514	-.1865	-.2935	-.1961	-.3709	-.2891
PSYDIS	-.4610	-.2955	-.3350	-.4686	-.1779	-.4746
IMPPOST	.1432	.0629	.2304	.1974	.0050	.2532
IMPCHN	-.0461	.0726	.2259	.2928	-.1066	.1792
OUTPOST	.2606	.1266	.3874	.2571	.3893	.4324
OUTCHN	.0693	.2655	.3923	.1160	-.1945	.2723
VALPOST	.3004	.1233	.3569	.2525	-.0450	.2984
VALCHN	.2183	.2846	.4018	.2776	-.2534	.2646
ARGUQ	.5271	.5742	.6434	.5070	.0481	.6092
EXPERT	.6656	.4307	.3694	.3561	-.0673	.4217
TRUST	1.0000	.3951	.2663	.3084	-.0112	.4343
REFF	.3951	1.0000	.6686	.5191	-.0881	.6769
SEFF	.2663	.6686	1.0000	.5901	.0402	.7011
SEVERE	.3084	.5191	.5901	1.0000	.1918	.6085
SUSCEP	-.0112	-.0881	.0402	.1918	1.0000	.0553
ATTPOST	.4343	.6769	.7011	.6085	.0553	1.0000
ATTCHN	.1420	.2405	.2808	.1498	-.3783	.3718

	ATTCHN
FEAR	.2178
PFEAR	.1104
DISCR	.2654
PSYDIS	-.1220
IMPPOST	.1264
IMPCHN	.1998
OUTPOST	-.0031
OUTCHN	.4043
VALPOST	.0926
VALCHN	.2953
ARGUQ	.2339
EXPERT	.1844
TRUST	.1420
REFF	.2405
SEFF	.2808
SEVERE	.1498
SUSCEP	-.3783
ATTPOST	.3718
ATTCHN	1.0000

N of cases: 62

APPENDIX C

CORRELATIONS AMONG THE VARIABLES FOR THE TETANUS MESSAGE

	FEAR	PFEAR	DISCR	PSYDIS	IMPPOST	IMPCHN
FEAR	1.0000	.3378	-.0635	-.0642	-.0514	-.1216
PFEAR	.3378	1.0000	-.0216	-.1603	.2421	.1926
DISCR	-.0635	-.0216	1.0000	.0427	-.0403	.1613
PSYDIS	-.0642	-.1603	.0427	1.0000	.1441	.2118
IMPPOST	-.0514	.2421	-.0403	.1441	1.0000	.6178
IMPCHN	-.1216	.1926	.1613	.2118	.6178	1.0000
OUTPOST	.0681	.1451	-.2677	-.2768	.1111	.1116
OUTCHN	.2706	.1390	.1631	.0620	.0035	.2464
VALPOST	.2497	.2937	-.2660	-.2350	.4427	.1317
VALCHN	.2670	.2861	.2003	.0385	.2728	.2873
ARGUQ	.2557	.1699	.1999	-.3519	.0799	.0386
EXPERT	.0381	.1184	.1269	-.1407	-.1100	-.0527
TRUST	-.0417	.1589	.1915	-.2935	-.0962	-.0218
REFF	.0628	.1547	-.1825	-.2002	.0249	.1291
SEFF	.1877	.0719	-.3723	-.0950	.0535	.0761
SEVERE	.4019	.2111	-.0648	-.2756	-.1856	-.0564
SUSCEP	.1347	.2983	.1522	-.0938	.0524	.0494
ATTPOST	.0957	.0641	-.2463	-.3525	.0149	-.1023
ATTCHN	-.1050	-.1022	.2700	.1818	-.0063	.0780

	OUTPOST	OUTCHN	VALPOST	VALCHN	ARGUQ	EXPERT
FEAR	.0681	.2706	.2497	.2670	.2557	.0381
PFEAR	.1451	.1390	.2937	.2861	.1699	.1184
DISCR	-.2677	.1631	-.2660	.2003	.1999	.1269
PSYDIS	-.2768	.0620	-.2350	.0385	-.3519	-.1407
IMPPOST	.1111	.0035	.4427	.2728	.0799	-.1100
IMPCHN	.1116	.2464	.1317	.2873	.0386	-.0527
OUTPOST	1.0000	.2479	.5817	.2945	.0983	.0349
OUTCHN	.2479	1.0000	.2094	.6670	.1441	.1726
VALPOST	.5817	.2094	1.0000	.5047	.3144	.0324
VALCHN	.2945	.6670	.5047	1.0000	.1758	.0470
ARGUQ	.0983	.1441	.3144	.1758	1.0000	.4915
EXPERT	.0349	.1726	.0324	.0470	.4915	1.0000
TRUST	.0318	.1444	-.1069	.1111	.5020	.6583
REFF	.2707	.0045	.2748	.1447	.1876	.1546
SEFF	.4640	.1180	.5162	.1448	.2171	.0603
SEVERE	.1322	.2451	.2230	.2086	.2775	.1187
SUSCEP	.2649	.4318	.1971	.3319	.1707	.1337
ATTPOST	.4075	-.1076	.3993	-.0075	.4802	.1952
ATTCHN	-.2603	.3806	-.1586	.2955	-.1105	.0324

	TRUST	REFF	SEFF	SEVERE	SUSCEP	ATTPOST
FEAR	-.0417	.0628	.1877	.4019	.1347	.0957
PFEAR	.1589	.1547	.0719	.2111	.2983	.0641
DISCR	.1915	-.1825	-.3723	-.0648	.1522	-.2463
PSYDIS	-.2935	-.2002	-.0950	-.2756	-.0938	-.3525
IMPPOST	-.0962	.0249	.0535	-.1856	.0524	.0149
IMPCHN	-.0218	.1291	.0761	-.0564	.0494	-.1023
OUTPOST	.0318	.2707	.4640	.1322	.2649	.4075
OUTCHN	.1444	.0045	.1180	.2451	.4318	-.1076
VALPOST	-.1069	.2748	.5162	.2230	.1971	.3993
VALCHN	.1111	.1447	.1448	.2086	.3319	-.0075
ARGUQ	.5020	.1876	.2171	.2775	.1707	.4802
EXPERT	.6583	.1546	.0603	.1187	.1337	.1952
TRUST	1.0000	.1468	-.0177	.1320	.2407	.2353
REFF	.1468	1.0000	.4339	.5658	.0410	.4267
SEFF	-.0177	.4339	1.0000	.2486	.0840	.5183
SEVERE	.1320	.5658	.2486	1.0000	.1449	.2438
SUSCEP	.2407	.0410	.0840	.1449	1.0000	.0502
ATTPOST	.2353	.4267	.5183	.2438	.0502	1.0000
ATTCHN	.0129	-.1575	-.2015	-.1248	-.0365	-.3122

	ATTCHN
FEAR	-.1050
PFEAR	-.1022
DISCR	.2700
PSYDIS	.1818
IMPPOST	-.0063
IMPCHN	.0780
OUTPOST	-.2603
OUTCHN	.3806
VALPOST	-.1586
VALCHN	.2955
ARGUQ	-.1105
EXPERT	.0324
TRUST	.0129
REFF	-.1575
SEFF	-.2015
SEVERE	-.1248
SUSCEP	-.0365
ATTPOST	-.3122
ATTCHN	1.0000

N of cases: 57

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