FEAR CONTROL AND DANGER CONTROL: A TEST OF THE EXTENDED PARALLEL PROCESS MODEL (EPPM)

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Fear appeals have the potential to be potent persuasive strategies. However, they often backfire. Previous research has focused primarily on the factors leading to fear appeal successes and neglected the factors associated with fear appeal failures. Utilizing a recently developed fear appeal theory, the Extended Parallel Process Model (EPPM), a study was undertaken to explore the cognitive and emotional mechanisms underlying the success and failure of fear appeals in the context of AIDS prevention. The study results offered general support for the EPPM and indicated that (a) the emotion fear is associated with fear control responses and is not directly related to danger control responses, (b) perceptions (or cognitions) about the recommended response are associated with danger control responses and unrelated to fear control responses, and (c) when efficacy beliefs are strong, perceived threat mediates the relationship between the emotion fear and behavior. Overall, it appears that cognitions lead to fear appeal success (i.e., attitude, intention, or behavior changes) via the danger control processes, while the emotion fear leads to fear appeal failure (i.e., defensive avoidance or reactance) via the fear control processes.

Scaring people into changing their behaviors is a popular persuasive strategy. Physicians threaten illness if patients do not comply with their regimens. Ministers threaten hell if parishioners do not seek forgiveness. Advertisers threaten immiment social demise if the advocated toothpaste, shampoo, or deodorant is not used. Sometimes scare tactics, formally called "fear appeals," succeed and other times they fail. What are the processes underlying the success or failure of fear appeals? One recently developed theory that addresses both when and why fear appeals work, as well as when and why they fail, is the Extended Parallel Process Model (Witte, 1992a).

The Extended Parallel Process Model (EPPM) is based on Leventhal's (1970) danger control/fear control framework and is an expansion of previous fear appeal theoretical approaches. Previous theoretical approaches explained the danger control processes or how people cognitively deal with a given *danger* or *threat* by changing their attitudes, intentions, or behaviors to prevent the threat from occurring (i.e., factors leading to message acceptance) (Boster & Mongeau, 1984; Rogers, 1975, 1983). Recent approaches have ignored the fear control processes or how people emotionally deal with their *fear* by denying or defensively avoiding the threat (i.e., factors leading to message rejection). The emotion fear, once a prominent construct in fear appeal theories (e.g., Hovland, Janis, & Kelly, 1953; Janis, 1967), has faded in importance over the years and has been neglected in current theoretical approaches (e.g., Rogers, 1975, 1983; Sutton, 1982).

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The EPPM offers a more balanced view of how people process fear appeals because it addresses both the cognitive and emotional factors associated with message processing and relates these processes to a fear appeal's success or failure. While danger control processes and persuasive success have been the focus of numerous studies, fear control processes and persuasive failure have rarely been studied. The purpose of the present work is to examine both the fear control and danger control processes together in the context of AIDS prevention. First, definitions, the EPPM, and hypotheses will be reviewed, then the study will be presented.

THE EXTENDED PARALLEL PROCESS MODEL

Definitions

Fear appeal. A fear appeal is defined as a persuasive message that attempts to arouse the emotion fear by depicting a personally relevant and significant threat and then follows this description of the threat by outlining recommendations presented as feasible and effective in deterring the threat (Witte, 1992a). The three key constructs in fear appeal research are threat, efficacy, and fear.

Threat. A threat is a danger or harm that exists in the environment whether individuals know it or not. An actual threat is to be distinguished from perceived threat, which is defined as cognitions or thoughts about the threat. Slovic and colleagues have shown that substantial differences exist between actual threats and individuals' perceptions of threats (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978; Slovic, 1987; Slovic, Fischhoff, & Lichtenstein, 1982). Fear appeal research has shown that perceived threat, or thoughts/cognitions about a danger or harm, is a key variable in persuasive processes.

Perceived threat is comprised of two underlying dimensions, perceived severity of the threat and perceived susceptibility to the threat. Perceived severity refers to beliefs about the significance or magnitude of the threat (e.g., "lung cancer leads to death"), while perceived susceptibility refers to individuals' beliefs about their risk of experiencing the threat (e.g., "I'm at-risk for lung cancer because I smoke cigarettes").

Efficacy. Efficacy pertains to the effectiveness, feasibility, and ease with which a recommended response impedes or averts a threat. The two dimensions underlying efficacy are response efficacy, which refers to the effectiveness of the recommended response in averting the threat, and self-efficacy, which refers to a person's ability to carry out a recommended response. As in threat, there is actual and perceived efficacy. Perceived response efficacy is defined as thoughts or cognitions about the effectiveness of the message's recommendations in deterring the threat (e.g., "I strongly believe that quitting cigarette smoking will prevent lung cancer"), while perceived self-efficacy is an individual's beliefs about his or her ability to perform the advocated response to avert the threat (e.g., "I am able to quit cigarette smoking").

Fear. Fear is an internal emotional reaction characterized by subjective experience (the psychological dimension, e.g., "I am scared") and physiological arousal (Dillard, 1993; Easterling & Leventhal, 1989; Witte, 1992a). The emotion fear is aroused when a serious and personally relevant threat is perceived.

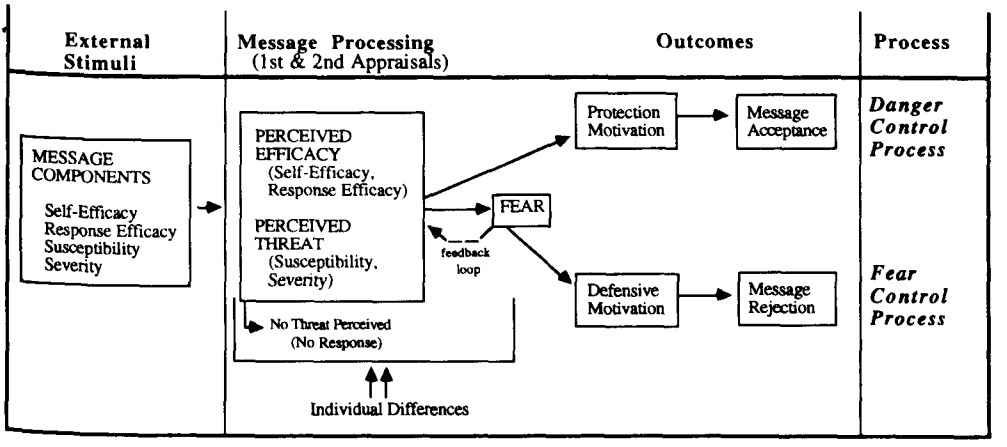


FIGURE 1

THE EXTENDED PARALLEL PROCESS MODEL (EPPM).

The EPPM

The EPPM incorporates Leventhal's (1970; Leventhal, Safer, & Panagis, 1983) parallel process model with elements of Rogers' (1975, 1983) protection motivation theory (PMT) and expands on both of these. Following is a brief review of the theory (see Witte, 1992a, for a detailed explanation).

According to the EPPM, the evaluation of a fear appeal initiates two appraisals of the message, which result in the domination of either danger control (i.e., cognitive processes) or fear control processes (i.e., emotional processes) (Figure 1). The two appraisals begin when an individual is presented with a fear appeal depicting the components of threat (i.e., severity and susceptibility) and the components of efficacy (i.e., response efficacy and self-efficacy). First, persons appraise the threat of the hazard. The greater the threat perceived, the more motivated individuals are to begin the second appraisal, which is an evaluation of the efficacy of the recommended response. When the threat is regarded as trivial or irrelevant (perceived as low), there is no motivation to process the message further; efficacy is evaluated superficially—if it is evaluated at all—and no response is made to the fear appeal. Witte (1991) found that regardless of efficacy level, the least amount of attitude, intention, and behavior change, occurred in the low threat condition.

As long as perceptions of efficacy are greater than perceptions of threat (e.g., "I know that AIDS is a terrible threat, but if I use condoms correctly, I can protect myself"), danger control processes will dominate, and the message will be accepted. Danger control processes are primarily cognitive processes where individuals (a) realize they are at risk for a severe danger (high threat), (b) believe they can effectively deter the threat (high efficacy), (c) become motivated to protect themselves, and (d) deliberately and cognitively confront the danger (e.g., "When I'm with my boyfriend next time I'm going to talk to him about using condoms"). The cognitions occurring in the danger control processes elicit protection motivation, which stimulates message acceptance responses such as attitude, intention, or behavior changes that control the danger.[1] Many investigators have found that fear appeals with high levels of threat (e.g., "you

are susceptible to the severe disease AIDS") *and* high levels of efficacy (e.g., "you are able to effectively and easily prevent AIDS by using condoms") produce the greatest amount of message acceptance (e.g., Kleinot & Rogers, 1982; Maddux & Rogers, 1983; Rogers & Mewborn, 1976; Witte, 1992b).

However, at some *critical point,* when persons realize they cannot prevent a serious threat from occurring, either because they believe the response to be ineffective or because they believe themselves to be incapable of performing the recommended response (e.g., "AIDS is terrible and easy to get; I don't think there's anything I can do to prevent contraction"), fear control processes will begin to dominate over danger control processes. Fear control processes are primarily emotional processes where people respond to and cope with their fear, not the danger. While danger control processes focus primarily on the control of external concerns (i.e., the threatening object or event), fear control processes focus primarily on the control of internal concerns (i.e., emotions, physiological reactions). Defensive motivation is elicited by heightened fear arousal, which occurs when perceived threat is high and perceived efficacy is low, and produces message rejection responses such as defensive avoidance or reactance. More specifically, people try to control their fear by suppressing thoughts of the danger (defensive avoidance) or by reacting against the communicator or message (i.e., perceived manipulation, message minimization). These fear control responses may occur automatically and outside conscious awareness (Bargh, 1989; Lazarus, 1991a, 1991b). Studies have shown that fear appeals with high levels of threat (e.g., "lung cancer is a severe disease that you are susceptible to because you smoke cigarettes") and low levels of efficacy (e.g., "it's unlikely that you'll be able to quit smoking cigarettes, and it's probably too late to prevent lung cancer anyway") result in message rejection and occasionally in boomerang effects (e.g., Kleinot & Rogers, 1982; Rippetoe & Rogers, 1987; Rogers & Mewborn, 1976; Witte, 1992b).

In short, the EPPM proposes (and studies have shown) that the relationship between threat and efficacy is multiplicative, such that high threat/high efficacy conditions initiate danger control processes and outcomes (i.e., positive changes in attitudes, intentions, and behaviors), while high threat/low efficacy conditions initiate fear control processes and outcomes (i.e., defensive avoidance or reactance). Overall, perceived threat determines the degree of the reaction to the message (i.e., how strongly a message is accepted or rejected), while perceived efficacy determines the nature of the reaction (i.e., whether danger control or fear control processes are initiated).

The Role of Fear in the EPPM

The role of the emotion fear in individuals' responses to fear appeals has been neglected and given a peripheral role in theoretical approaches during the last two decades (Dillard, 1993; Witte, 1992a). One reason for this neglect of the emotion fear is that researchers have focused on explaining the processes associated with message acceptance (Rogers, 1975, 1983), while fear is more associated with message rejection processes (Janis, 1967; Leventhal, 1970; Witte, 1992a, 1993). The factors leading to message rejection have yet to be adequately explored but are equally important if we are to fully understand reactions to fear-arousing messages.

A Test of the Fear Control and Danger Control Processes

Overview. The goal of the present work is to test the EPPM's proposals regarding the fear control and danger control processes. Previous work has established the general causes of fear control and danger control. Specifically, fear control processes are initiated by high threat/low efficacy conditions (e.g., "I'm at-risk for this terrible threat and there's nothing I can do to prevent it"), while danger control processes are initiated by high threat/high efficacy conditions (e.g., "I'm at-risk for this terrible threat but if I follow the recommended response, I'll be able to prevent it") (Witte, 1992b). However, the underlying mechanisms explaining each process have yet to be examined. In order to fill this void, an experiment manipulating threat and efficacy was undertaken with the goal of uncovering the cognitive and emotional mechanisms associated with each process.

Hypotheses. The EPPM proposes the emotion fear is initially aroused during the first appraisal process, when a serious and personally relevant threat is perceived. Thus, depictions of threat in a message should result in perceived threat, which should lead to fear arousal.

H1a: Message threat causes perceived threat, which causes fear.
H1b: The stronger the threat perceived, the greater the fear aroused.

Fear arousal is further increased when efficacy is perceived as low. For example, the EPPM hypothesizes that individuals will be the most frightened when they feel helpless in the face of a grave threat.

H2: Fear arousal will be greater as threat increases when perceived efficacy is low, than when perceived efficacy is high.

Overall, the EPPM maintains that emotional fear control processes lead to message rejection outcomes and cognitive danger control processes lead to message acceptance outcomes. Therefore, the emotion fear should be the proximal cause of message rejection, while cognitions about the recommended response and threat (i.e., perceived efficacy and perceived threat) should be the proximal causes of message acceptance. Concomitantly, the emotion fear should not be directly related to message acceptance, and thoughts about the threat and how to prevent it (i.e., perceived efficacy and perceived threat) should not be directly related to message rejection. In other words, when fear control processes dominate, thoughts about the threat and efficacy of the recommended response should be absent and therefore unrelated to fear control outcomes (i.e., if one is denying a threat, one is not thinking of ways to prevent it). In contrast, when one believes there is a feasible and effective way to deter a threat (i.e., thoughts about the threat and efficacy), only thoughts—and not fear—should directly influence the adoption of a message's recommendations. Thus, fear should not be directly related to message acceptance. This analysis suggests the following hypotheses.

H3: There is a direct positive relationship between fear and message rejection outcomes, such as defensive avoidance and reactance.
H4: Fear is not directly associated with message acceptance outcomes such as attitudes, intentions or behaviors.

H5: Perceived efficacy (i.e., cognitions about the recommended response) is unrelated to message rejection outcomes such as defensive avoidance or reactance.
H6: Perceived efficacy (i.e., cognitions about efficacy) is positively associated with message acceptance outcomes such as attitudes, intentions, and behaviors.
H7: Perceived threat (i.e., cognitions about the threat) is unrelated to message rejection outcomes such as defensive avoidance or reactance.
H8: Perceived threat (i.e., cognitions about the threat) is positively associated with message acceptance outcomes such as attitudes, intentions, and behaviors.

The role of the emotion fear in danger control processes is complex. The EPPM contends that fear is not directly related to message acceptance (H4). However, the EPPM does maintain that when people believe they can effectively deter the threat (i.e., perceived efficacy is greater than perceived threat), then (a) the emotion fear can be cognitively appraised, (b) the cognitive appraisal of the emotion fear can cause one to upgrade his or her perceptions of threat, and then (c) these upgraded perceptions of threat can positively influence message acceptance (see Figure 1, feedback loop). Cognitive appraisal of the emotion fear occurs frequently. For example, Janis and Mann (1977) note, "every physical symptom a person notices in himself [or herself] constitutes a warning signal" (p. 66). Thus, following the evaluation of a fear appeal, individuals with high perceived efficacy (e.g., "I believe that I can effectively use condoms to prevent AIDS") might think:

(a) "I'm at-risk for AIDS, and I could die if I get it" (*perceived threat*);
(b) *The emotion fear is aroused;*
(c) "Look at how much this scares me—my hands are sweating!" (*cognitive appraisal of the emotion fear*);
(d) "My getting AIDS is a more serious threat than I thought it was" (*upgraded estimations of the threat*);
(e) "I'm going to go buy condoms and use them to prevent AIDS" (*message acceptance*).

Because danger control processes dominate when perceived efficacy is higher than perceived threat, cognitive processes still prevail and allow one to thoughtfully assess his or her emotions. Thus, perceived threat is proposed to mediate the relationship between the emotion fear and message acceptance when efficacy is believed to be high.

H9a: Perceived threat mediates the relationship between fear and attitudes when perceived efficacy is high.
H9b: Perceived threat mediates the relationship between fear and intentions when perceived efficacy is high.
H9c: Perceived threat mediates the relationship between fear and behaviors when perceived efficacy is high.

Summary

In sum, the EPPM argues that (a) the emotion of fear is associated with message rejection and is not directly related to message acceptance, (b) perceptions (or cognitions) are associated with message acceptance and unrelated to message rejection, and (c) when efficacy beliefs are strong, the emotion fear may be indirectly related to message acceptance. Thus, fear must be present for fear control processes to occur, while danger control processes can occur with or without the production of fear.

Fear appeals have the potential to be potent persuasive strategies. But first they must be understood. The goal of the present study is to increase our understanding of fear appeals by examining the underlying mechanisms leading to fear or danger control responses.

METHOD

Design

Threat and efficacy were varied in a 3 (high, moderate, low threat) X 2 (high, low efficacy) full-factorial design with one no-message population comparison group. Data were gathered immediately after the experiment and six weeks later.

Participants

Because the fear appeals were targeted toward sexually active unmarried individuals who knew relatively little about AIDS, participants were screened prior to their involvement in the study. Only those people who had had sexual intercourse, were not in long-term monogamous relationships, and had not taken a course on AIDS or human sexuality were eligible.

Extra credit was given to 146 undergraduates for their participation in phase 1 of the study (the immediate posttest). Approximately equal numbers of males and females composed each experimental condition. Most of the study participants were between ages 17–24 (93%) and they averaged 1.4 sexual partners in the previous six months. Nearly all of the participants were heterosexual (97%) and 66.4% were White, 17.8% were Asian, 11% were Hispanic, and 0.7% were African-American.

At the follow-up six weeks later, approximately 115 persons returned, resulting in a 21% attrition rate. Attrition appeared to be random across cells, $\chi^2(6, N = 146) = 2.25, p = .90$.

Procedure

Participants were told they were going to evaluate AIDS education materials in the early stages of development, and that their reactions were needed in order to refine them. Combinations of the independent variables were presented in printed messages to randomly assigned, pre-screened participants in groups ranging up to 12 members. Students were asked to read their message carefully, underline important passages, and then fill out the questionnaire. They returned six weeks later to complete a follow-up questionnaire. To increase the likelihood that they would answer questions honestly, participant anonymity was stressed (they created their own secret code for matching purposes).

The Message Manipulations

Each person received a folder consisting of (a) a core message based on a public health service brochure (U.S. Public Health Service, n.d.); (b) a case study of a fictitious AIDS patient; and (c) a message about the effectiveness of condoms. Four photos were imbedded in the core message and the case study. Threat was manipulated in the first two sections (core message and case study),

while efficacy was manipulated in the last section. Each message was developed by compiling verbatim passages from several HIV textbooks, government documents, and other sources (e.g., American Red Cross, 1988; Broder, 1987; Ebbesen, Biggar, & Melbye, 1984; Farthing, Brown, & Staughton, 1988; Leventhal, 1965; UCI AIDS Program, n.d.; U.S. Department of Education, 1988). All information contained in the messages was accurate, but each message emphasized different issues (e.g., condoms work most of the time; condoms fail some of the time).

Threat manipulations. In the low threat message, severity and susceptibility were minimized by showing innocuous photographs of clinical laboratory tests, by describing how AIDS affected the African continent, by focusing on the impact of AIDS on non-college-aged risk groups, and by using neutral language (e.g., "On admission, the patient complained of fatigue and a rash"). In the moderate threat message, severity of AIDS was described in moderately vivid terms (e.g., "On admission, the patient complained of fatigue and lumps on the neck") and photographs showed intermediate stages of the disease (e.g., Kaposi's sarcoma). Moderately personalistic language emphasizing the susceptibility of heterosexuals in the United States to HIV-infection was used to induce moderate levels of perceived susceptibility. In the high threat message, severity was emphasized by showing graphic photographs of late-stage AIDS victims and by using extremely vivid language (e.g., "On admission, the patient complained of fatigue and bleeding, oozing sores all over his body"). HIV-infection in college students and "*your*" personal risk of contracting the AIDS-virus were emphasized in personalistic language to maximize perceived susceptibility to AIDS.

Efficacy manipulations. For the low efficacy message, response efficacy was minimized by citing studies that found condoms fail some of the time and that people have contracted HIV while using condoms. To minimize self-efficacy, the problems associated with using condoms were highlighted (e.g., awkward to use, can be messy) and a list of typical excuses people give for not using condoms was given, but not directly refuted (the message simply stated these beliefs might be false). For the high efficacy message, response efficacy was maximized by emphasizing that condoms substantially reduce the risk of HIV transmission if used correctly and self-efficacy was increased by discussing the benefits and ease of using condoms, as well as providing refutations of typical excuses partners give for not wanting to use condoms.

Summary. Each message was equated for length, order of arguments, and number of pictures. Messages and measures were subjected to extensive pilot-testing and validation in three phases. Manipulation checks in the main study further validated the message manipulations.

MEASURES

Except where noted, 7-point Likert-type response formats were used.

Demographic Variables

Gender, age, ethnicity, sexual orientation, prior intravenous drug use, and sexual practices (e.g., condom use, monogamous, many partners, sex with IV drug user) were assessed for use as control variables when needed.

Manipulation Checks

The components of efficacy, response efficacy and self-efficacy, were measured with two items each. Self-efficacy was assessed with such questions as, "A sex partner(s) and I are able to use condoms to prevent AIDS"—"strongly disagree" to "strongly agree" and response efficacy was determined by questions like, "I think that condoms prevent AIDS"—"strongly disagree" to "strongly agree." The efficacy items were averaged to create an overall index ($\alpha = .71$).

The components of threat, susceptibility and severity, were measured with three items each. Perceived susceptibility to AIDS was assessed with such questions as, "How possible is it for you to get AIDS?"—"not at all possible" to "extremely possible." For perceived severity, pilot studies indicated a strong ceiling effect for Likert-type items (e.g., regardless of the threat condition, participants thought AIDS was "extremely serious"). Therefore, a three question "gruesome" scale was developed. First, people were asked to rank several diseases from the most serious to the least serious (e.g., Alzheimer's disease, cancer, AIDS). Then, people were asked to rank the "least" to "worst" "way to die," and the "least" to "most" "painful way to die" with the following items: drowning in the ocean, burning to death in a fire, suffocating to death, dying from AIDS, dying from throat cancer, dying from torture, dying from being buried alive in sand. The rank of AIDS on these scales resulted in a scale value for perceived severity of AIDS (e.g., if AIDS was the 2nd worst way to die, then on a scale from least worst way to die [1] to the worst way to die [7], AIDS would receive a value of 6 for severity of AIDS). Pilot studies indicated that the ceiling effect was successfully resolved with this "gruesome" scale. For example, those in the low threat group tended to rank AIDS low on seriousness, way to die, and pain (i.e., 1s or 2s), compared to those in the high threat group who almost always ranked AIDS as the most serious, worst, and painful way to die (i.e., 7s). While the ceiling effect was solved, it contributed to a unstable alpha for the overall threat index ($\alpha = .57$). Caution should be used in interpreting the results from tests of perceived threat because of its reduced reliability, which indicates a potential lack of accuracy in the measure (i.e., the items resulted in a less homogenous measure than what is traditionally used).

Confound Checks

Each person rated the accuracy, objectivity, ease of reading, and understanding of the message. A three-item learning scale also assessed whether individuals thought they learned a lot about "AIDS," "AIDS prevention," or "condom use" from the message ($\alpha = .90$).

Fear

Fear arousal was measured by having participants rate the following mood adjectives ("not at all" to "very much"): frightened, tense, nervous, anxious, uncomfortable, and nauseous ($\alpha = .88$). It is important to note that perceived fear and not "actual" fear was measured. However, these items fit our definition of fear in that they assess the subjective experience of fear and have been shown to correlate positively with physiological arousal (Mewborn & Rogers, 1979).

Dependent Variables

Attitudes. Attitudes toward condoms were assessed with six semantic differential scales (e.g., "bad/good," "desirable/undesirable," "favorable/unfavorable," "not pleasurable/pleasurable," "not effective/effective," "romantic/not romantic") at the immediate posttest (α = .82) and six-week follow-up (α = .84).

Intentions. Intentions to use condoms were measured with five questions on the immediate posttest (e.g., "Do you intend to use condoms at all during the next 4–6 weeks?"—"definitely no/definitely yes"; "I plan to use condoms during the next 4–6 weeks"—"not at all/every time I have sex"; α = .83).

Behaviors. Behaviors were assessed at the six-week follow-up with five questions (e.g., "Did you and a partner(s) use condoms?"—"no, never . . . /yes, frequently"; "Did you plan to use condoms since you first participated in this study?"—"No, never . . . /Yes, planned and used them"; "Did you practice any safe sex skills since you first participated in this study?"—"definitely no/definitely yes"). The low reliability of this measure (α = .69) indicates the results should be viewed with caution.

Defensive avoidance. While defensive avoidance occurs immediately, it is difficult to detect without a time delay because defensive avoidance blocks threatening or fear-arousing material from being stored in memory structures (Erdelyi, 1974; Lazarus, 1991a, 1991b; Maddi, 1989). Therefore, to truly assess avoidance patterns, one must delay measurement of the construct. At the six-week follow-up, participants were asked, "How much time did you spend thinking about the message you read?" (1—"I didn't think about it at all" to 7—"I thought about it very often"); and "How frequently have you thought about the message since you read it?" (1—"Not at all" to 7—"Most of the time"). In addition, participants were asked to respond to the following question in three ways, "When I was first reading the message and looking at the pictures, my first instinct was to": (a) "*want* to/*not* want to think about AIDS"; (b) "*want* to/*not* want to do something to keep myself from getting AIDS"; and (c) "*want* to/*not* want to protect myself from AIDS." This five-item index (α = .71) was validated with indirect measures of defensive avoidance (a memory test and content analysis of cognitive responses), which were gathered at both the immediate posttest and the six-week follow-up (see Witte, 1991, for validation information).

Reactance. Reactance was measured by assessing the degree to which (a) persons derogated or minimized the message (i.e., their feelings and impressions of the message) and (b) the degree to which they perceived manipulation from the message (Brehm, 1966). The message minimization questions assessed whether people thought that the message was "distorted," "overblown," "exaggerated," "boring," or "overstated" (α = .78). The perceived manipulation questions asked whether the participants felt "manipulated," "exploited," or whether the message "deliberately tried to manipulate my feelings" (posttest α = .66, follow-up α = .81). As for defensive avoidance, the reactance measures were validated with content analyses of respondents' cognitive responses (see Witte, 1991).

RESULTS

Overview

Manipulation checks for threat and efficacy were computed. Evaluation of assumptions of normality, homogeneity of variances, and linearity for the dependent variables indicated that all were satisfactory except for the normality assumption for immediate posttest attitudes and intentions (significant skewness for both, $p < .001$). However, Tabachnick and Fidell (1989) and Hays (1981) note the robustness of statistical tests if normality assumptions are violated. Therefore, transformations were not performed. No within cell outliers were detected using Mahalanobis' distance ($p < .001$). Table 1 presents a summary of the results.

Manipulation Checks

Power exceeded .80 to detect a moderately large effect size (.40, $\alpha = .05$, one-tailed test) with at least 19 persons per cell for the manipulation and confound check tests (Kraemer & Thiemann, 1987, p. 106).[2]

Perceived threat. A significant main effect for the threat message was found on the perceived threat measure, $F(2, 123) = 10.80, p < .0001$. No other significant main effects or interactions were found (i.e., being in a high or low efficacy group did not significantly affect perceptions of threat). Those reading the high threat message believed AIDS to be a more relevant and significant threat ($M = 4.69$) than those reading the moderate threat message ($M = 4.31$), and those reading the low threat message ($M = 3.88$). Tukey's multiple-range test ($p < .05$) revealed that the high threat message produced significantly greater threat of AIDS beliefs than the moderate threat message, which produced significantly greater threat of AIDS beliefs than the low threat message.

For the follow-up (6 weeks later), a significant main effect for threat message was obtained on the follow-up perceived threat measure, $F(2, 96) = 6.23, p < .01$. No other significant main effects or interactions were found. Those people exposed to the high threat message believed AIDS was more threatening ($M = 4.46$) than those exposed to the moderate threat message ($M = 4.06$), who in turn, thought AIDS was more threatening than those reading the low threat message ($M = 3.68$). Tukey's multiple-range test ($p < .05$) showed that the high threat message produced significantly stronger threat of AIDS beliefs than low threat message. The differences between the high and moderate threat messages and the moderate and low threat messages were not significant.

Perceived efficacy. A significant main effect for the efficacy message was obtained on the perceived efficacy measure, $F(1, 124) = 45.21, p < .0001$. No other significant main effects or interactions were found. Stronger efficacy beliefs emerged among those in the high efficacy group ($M = 5.81$) compared to those in the low efficacy group ($M = 4.55$).

No significant main effects or interactions were detected in the follow-up, six weeks later. High efficacy participants had stronger efficacy beliefs ($M = 5.54$) than low efficacy persons ($M = 5.23$), but the difference was not significant.

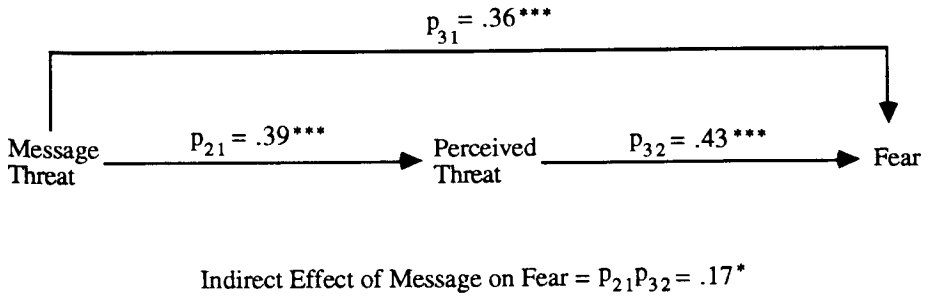
Confound checks. No differences were detected across threat or efficacy message level for objectivity, learning of the message, or understanding of the

TABLE 1

SUMMARY OF HYPOTHESES AND RESULTS

Hypotheses	Results
Causes of Fear	
H1a. Message threat causes perceived threat, which causes fear.	*Partially Supported:* Message threat influenced the emotion fear both indirectly (predicted) and directly (not predicted).
H1b. The stronger the threat perceived, the greater the fear aroused.	*Supported:* Stronger perceptions of threat resulted in more reported fear arousal.
H2. Fear arousal will be greater as threat increases when perceived efficacy is low, than when perceived efficacy is high.	*Not Supported:* Fear arousal and the perceived threat-fear relation did not vary across efficacy group.
Fear and Outcomes	
H3. There is a direct positive relationship between fear and message rejection.	*Partially Supported.* The greater the perceived manipulation, the more fear experienced. The greater the defensive avoidance and message minimization, the less fear experienced.
H4. Fear is not directly associated with message acceptance.	*Supported.* Fear was unrelated to attitudes, intentions, or behaviors.
Perceived Efficacy and Outcomes	
H5. Perceived efficacy is unrelated to message rejection.	*Supported.* Perceived efficacy was unrelated to defensive avoidance, perceived manipulation, or message minimization.
H6. Perceived efficacy is positively associated with message acceptance.	*Supported.* The greater the perceived efficacy, the more positive attitudes, intentions, and behaviors were toward condom use.
Perceived Threat and Outcomes	
H7. Perceived threat is unrelated to message rejection.	*Partially Supported.* As predicted, perceived manipulation was unrelated to perceived threat, but contrary to the predictions the less threatening the threat, the more defensive avoidance and message minimization.
H8. Perceived threat is positively associated with message acceptance.	*Partially Supported.* The greater the threat perceived, the more positive attitudes, intentions, and behaviors were toward condom use. But only the relation between intentions and threat was significant (marginal significance was reached for the other variables).
Indirect Influence of Fear on Message Acceptance Outcomes	
H9a. Perceived threat mediates the relationship between fear and attitudes when perceived efficacy is high.	*Not Supported.* Fear and perceived threat did not influence attitudes at all for high perceived efficacy subjects—either directly or indirectly.
H9b. Perceived threat mediates the relationship between fear and intentions when perceived efficacy is high.	*Partially Supported.* Fear affected intentions indirectly (predicted) as well as directly (not predicted) for high efficacy subjects.
H9c. Perceived threat mediates the relationship between fear and behaviors when perceived efficacy is high.	*Supported.* Perceived threat mediated the relationship between fear and behaviors for high efficacy subjects.

message. However, there was a significant main effect for efficacy on the accuracy measure, $F(1, 120) = 5.995, p = .02$. Respondents who read the high efficacy message ($M = 5.76$) rated it as more accurate than those people who read the low efficacy message ($M = 5.14$). One plausible reason for this finding is that college students generally believe they can use condoms to effectively prevent AIDS (e.g., Kegeles, Adler, & Irwin, 1988). Because of these high



*$p < .05$; **$p < .01$; ***$p < .001$.

Note: Cohen and Cohen (1983) note that if p_{21} and p_{31} are each significantly different from zero, then the indirect path is significant (p. 366).

FIGURE 2

STANDARDIZED PATH MODEL WITH THE DIRECT AND INDIRECT EFFECTS OF MESSAGE THREAT AND PERCEIVED THREAT ON FEAR.

efficacy baseline perceptions, they may evaluate a message as less accurate if evidence is presented to the contrary.

Fear and Threat (Hypotheses 1a and 1b).

Hypothesis 1a, that *message threat causes perceived threat, which causes fear,* was tested using Asher's (1983) and Cohen and Cohen's (1983) procedures for calculating path model coefficients and significance levels. The specific path model tested was, message threat—p_{21}—> perceived threat—p_{32}—> fear. Hypothesis 1a was partially supported. The results indicate that message threat plays both an indirect (predicted) and direct (not predicted) role on fear. Figure 2 shows the standardized path model. The squared semi-partial correlations (sr^2) indicated that message threat accounted for 15% ($p < .0001$) of the variance for perceived threat and for 19% ($p < .0001$) of the variance for fear. The model as a whole explained 30% of the variance ($p < .0001$) for fear. There was a significant indirect effect of message threat on fear of .17.[3]

Hypothesis 1b, *the stronger the threat perceived, the greater the fear aroused,* was supported. Perceived threat correlated positively with fear arousal, $r(124) = .43$, $p < .0001$.

Low Efficacy, Fear, and Threat (Hypothesis 2)

To test hypothesis 2, that *fear arousal will be greater as threat increases when perceived efficacy is low, than when perceived efficacy is high,* group means of fear and within-group correlations between perceived threat and fear were compared. There were no significant differences in reported fear between the high efficacy ($M = 3.69$) and low efficacy ($M = 3.61$) groups, $t(122) = -.36$, $p = .72$. Power exceeded .95 to detect a medium effect size ($d = .50$) with a one-tailed test

TABLE 2

CORRELATIONS BETWEEN FEAR, PERCEIVED EFFICACY, PERCEIVED THREAT, AND OUTCOMES

	Message Rejection Outcomes			Message Acceptance Outcomes		
	Defensive Avoidance	Perceived Manipulation	Message Minimization	Posttest Attitudes	Condom Intensions	Behavior Changes
Fear	−.29** (92)	.30*** (123)	−.18* (124)	−.09 (124)	.01 (120)	.09 (54)
Perceived efficacy	−.09 (93)	.03 (125)	−.06 (126)	.50*** (145)	.32*** (142)	.43*** (54)
Perceived threat	−.42*** (93)	.06 (125)	−.30*** (126)	.10 (144)	.15* (141)	.17 (54)

*$p < .05$. **$p < .01$. ***$p < .001$.

($\alpha = .05$; Cohen, 1988, pp. 40, 55). Likewise, Fisher's r to z transformations to test for differences between correlation coefficients for different groups resulted in no significant differences ($z = .26$) between those in the low efficacy group ($r[64] = .37$, $p < .001$) and those in the high efficacy group ($r[62] = .41$, $p < .001$). Power was adequate to detect a large effect size ($q = .50$, $\alpha = .05$) at .78, but weak at .37 to detect a medium effect size ($q = .30$, $\alpha = .05$, Cohen, 1988, pp. 115, 126).

A median split was employed to separate those with high efficacy beliefs from those with low efficacy beliefs. Fear did not differ significantly between those perceiving low efficacy ($M = 3.75$) and those perceiving high efficacy ($M = 3.56$), $t(122) = .80$, $p = .43$. Power exceeded .95 to detect a medium effect ($d = .50$, $\alpha = .05$; Cohen, 1988, p. 40, 55). Intra-class correlations indicated that the relation between perceived threat and fear was nearly identical for individuals with low perceived efficacy ($r[58] = .42$, $p < .001$) compared to those with high perceived efficacy, $r(66) = .45$, $p < .001$; $z = .20$). Power exceeded .84 to detect large effect sizes ($q = .50$, $\alpha = .05$), but was weak at .47 to detect a medium effect size ($q = .30$, $\alpha = .05$; Cohen, 1988, pp. 115, 120).

Perceived efficacy and fear were inversely correlated in the low threat group only, $r(42) = -.45$, $p < .01$. When threat was depicted as low in the message, lower perceived efficacy was associated with greater fear. Fear and perceived efficacy were unrelated in the moderate threat group ($r[41] = .05$, $p = .38$) or the high threat group, $r(41) = -.12$, $p = .23$. Power was .84 to detect a large effect size ($r = .50$, $\alpha = .05$) and .61 to detect a medium effect size ($r = .30$, $\alpha = .05$; Cohen, 1988, pp. 83, 86).

Cognitions and Emotions (Hypotheses 3–8)

Table 2 reports the results for hypotheses 3 through 8. Hypothesis 3, that *fear is positively associated with message rejection outcomes,* received support for one of the fear control outcomes (perceived manipulation), and was unexpectedly *negatively* related to the other two message rejection outcomes (defensive avoidance and message minimization). Thus more fear was experienced by those perceiving greater manipulation, but less fear was experienced by those who minimized or defensively avoided the message. Hypothesis 4, that *fear is unassociated with message acceptance,* was confirmed. Without exception, the emotion fear was unrelated to attitudes, intentions, or behaviors.

Hypotheses 5 and 6, that *perceived efficacy is (H5) unrelated to message rejection and (H6) related to message acceptance*, were supported. As predicted, the stronger the perceptions of efficacy (cognitions about efficacy), the more attitude, intention, and behavior change participants reported. Efficacy perceptions were totally unrelated to perceived manipulation, defensive avoidance, and message minimization.

Hypothesis 7, that *perceived threat is unrelated to message rejection*, was partially supported. As predicted, perceived threat was unassociated with perceived manipulation. But, perceived threat was inversely correlated with defensive avoidance and message minimization such that the greater the threat perceived, the less message minimization and defensive avoidance occurred. Hypothesis 8, that *perceived threat is related to message acceptance*, received partial support. Perceived threat was positively related to all message acceptance outcomes, although its relationship with attitudes and behaviors failed to reach conventional levels of significance (i.e., for perceived threat/attitudes and perceived threat/behavior correlations, $p < .117$). Power was greater than .83 to detect medium effect sizes ($r = .30$) with one-tailed tests ($\alpha = .05$) for hypotheses 3–8 except when behavior was the dependent variable, where power dropped to .61 to detect a medium effect size but remained high at .98 to detect a large effect size (Cohen, 1988, pp. 83, 93).

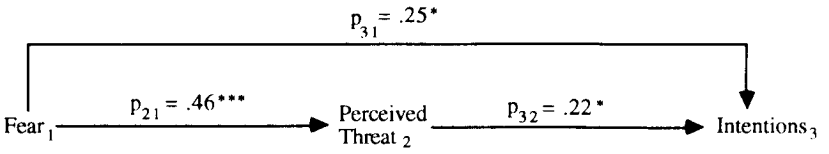
Mediation and Perceived Threat (Hypothesis 9)

Hypothesis 9 proposed that *when perceived efficacy is high, fear is indirectly related to message acceptance responses, as mediated by perceived threat* (i.e., fear—p_{21}—> perceived threat—p_{32}—> message acceptance outcomes). Thus, only those people with high perceived efficacy, as determined by a median split, were used in these analyses. Sixty-six persons scored at or above the median 5.5 for perceived efficacy. Again, the procedures outlined by Asher (1983) and Cohen and Cohen (1983) were used. To assess the true impact of theoretical variables, four control variables (i.e., prior condom use, age, exclusivity of sexual relationships [e.g., monogamy, many partners], and intimacy of sexual partners [e.g., stranger, acquaintance]) were entered first into each regression equation in a hierarchical manner. Power was .92 to detect a large effect size ($r = .50$) and .70 to detect a medium effect size ($r = .30$) with one-tailed tests ($\alpha = .05$; Cohen, 1988, pp. 83, 93).

Attitudes. Hypothesis 9a was not supported. Fear and perceived threat did not influence attitudes—either directly or indirectly—for high perceived efficacy people. Fear did significantly influence perceived threat ($p_{21} = .46$, $sr^2 = .21$, $p < .001$). But, both fear ($p_{31} = .10$, $sr^2 = .007$, N.S.) and perceived threat ($p_{32} = .13$, $sr^2 = .02$, N.S.) were unrelated to attitudes. The indirect effect of fear on attitudes was negligible (.06). Removing the influence of covariates, the theoretical model explained only 2% of the variance for attitudes.

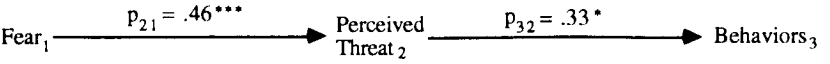
Intentions. Hypothesis 9b was partially supported. The results indicate that fear affects intentions both indirectly (predicted) and directly (not predicted). Figure 3a shows the standardized path model with both the direct and indirect effects of fear on intentions. There is a modest but significant indirect effect of fear on intentions of .10. Fear accounted for 21% ($p < .0001$) of the variance for

Figure 3a. Intentions and High Perceived Efficacy Subjects.



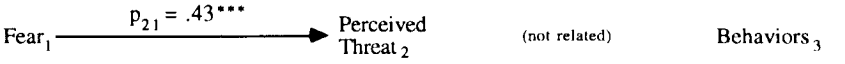
Indirect Effect of Fear on Intentions = $p_{21}p_{32} = .10^{*}$

Figure 3b. Behaviors and High Perceived Efficacy Subjects.



Indirect Effect of Fear on Behaviors = $p_{21}p_{32} = .15^{*}$
(High Perceived Efficacy Subjects Only)

Figure 3c. Behaviors and Total Sample (including low efficacy subjects).



Indirect Effect of Fear on Behaviors = $p_{21}p_{32} = .03$ (ns)
(Total Sample, Including Low Efficacy Subjects)

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Note: Cohen and Cohen (1983) note that if p_{21} and p_{31} are each significantly different from zero, then the indirect path is significant (p. 366).

FIGURE 3

STANDARDIZED PATH MODELS WITH THE DIRECT AND INDIRECT EFFECTS OF FEAR AND PERCEIVED THREAT ON MESSAGE ACCEPTANCE OUTCOMES.

perceived threat, and for 5% ($p < .05$) of the variance for intentions. The theoretical model (not including covariates) explained 11% of the variance ($p < .001$) for intentions. Overall, perceived threat appears to mediate some of the relationship between fear and intentions when perceived efficacy is high, but fear also directly influences intentions.

Behaviors. Hypothesis 9c was supported. The results indicate that fear affects behavior indirectly, as mediated by perceived threat. Figure 3b shows the standardized path model for the effects of fear on behaviors when perceived efficacy is high. Fear accounted for 21% ($p < .0001$) of the variance for perceived threat, and perceived threat accounted for 10% ($p < .05$) of the variance for behaviors. But, fear did not directly influence behaviors ($sr^2 = .02$, N.S.). The indirect effect of fear on behavior through perceived threat was significant at .15. The model (not including covariates) accounted for 19% of the variance ($p < .01$) for behaviors.

It is interesting to compare the path model in Figure 3b, which is calculated with high perceived efficacy people only, with the path model in Figure 3c, which is calculated with the total sample. As predicted by the EPPM, perceived threat mediates the relationship between fear and behavior *only* when perceived efficacy is high (i.e., Figure 3b). When the whole population is used, however, fear is unrelated to behaviors as illustrated by Figure 3c (and predicted by the EPPM). In short, perceived threat appeared to be the underlying variable that explained the relationship between fear and behavior for those with high perceived efficacy.

DISCUSSION

Overall, the pattern of findings was consistent with the Extended Parallel Process Model's predictions, though some specific hypotheses were not supported. In general, the evidence indicated that cognitions (i.e., perceptions) and emotions (i.e., fear) are related to the separate parallel processes in predictable patterns. First, the results demonstrated that danger control processes are primarily cognitive processes. The strong relationship between cognitions about the recommended response (i.e., perceived efficacy) and message acceptance outcomes (H6) suggests that when danger control processes dominate, people think of ways to avert the threat and put these plans into action. Likewise, the positive association between cognitions about the threat (i.e., perceived threat) and message acceptance outcomes (H8) shows that as individuals believe themselves more susceptible to AIDS, a fatal disease, they develop more positive attitudes, intentions, and behaviors toward condom use. However, the perceived threat-message acceptance outcome results should be viewed cautiously because only one of the three correlations achieved statistical significance (i.e., the perceived threat-intentions correlation). Finally, the finding that the emotion fear is not directly related to message acceptance further demonstrates the cognitive nature of danger control processes. Thus, it seems clear that when danger control processes dominate, individuals utilize cognitive strategies to reduce or contain the threat.

Second, the results for fear control processes also reveal patterns consistent with the EPPM, although in a somewhat unexpected manner. As suggested by the EPPM, fear control processes appear to be primarily emotional processes where thoughts about the recommended response and threat are suspended as individuals cope with their fear. Thoughts about the recommended response (i.e., perceived efficacy) were unrelated to any of the message rejection outcomes (H5). When individuals defensively avoided the threat or reacted against the message (i.e., perceived manipulation, minimized the message), they did not

think about the responses recommended to avert the threat. Similarly, when individuals engaged in one type of reactance, perceived manipulation, they did not think about the threat of AIDS (H7). Contrary to the predictions, however, the more defensive avoidance and message minimization occurred, the less threatening AIDS became (H7). Also contrary to the predictions, *less* fear was experienced for those who engaged in more defensive avoidance and message minimization (H3). (However, consistent with the predictions, more fear was experienced as perceived manipulation of the message increased [H3].) These results, although contrary to the hypotheses, are interesting in that they conform with a basic tenet of the EPPM. The function of fear control processes, according to the EPPM, is to *control* the emotion fear. In the case of defensive avoidance and message minimization individuals controlled their fear so well that less fear was experienced and AIDS was subsequently perceived as less threatening. Thus, it appears that fear control processes *are* emotional processes where fear is significantly associated—sometimes positively and sometimes negatively—with message rejection responses.

In sum, the basic tenets of the EPPM that (a) fear is significantly associated with message rejection responses and unassociated with message acceptance responses and that (b) cognitions about the recommended response are significantly associated with message acceptance and unassociated with message rejection, were supported. The findings demonstrated that (a) fear control is a primarily emotional process and (b) danger control is a primarily cognitive process. Future research should seek to explain when the emotion fear would be expected to positively correlate and when it would be expected to negatively correlate with fear control responses.

The Causes of Fear

The examination of the causes of fear revealed some interesting patterns. As expected, the greater the threat perceived, the greater the fear expressed (H1b). This finding explains why greater fear may be associated with greater message acceptance—not because fear causes message acceptance, but because fear and message acceptance "are caused by the same underlying factor (namely, the cognitive reactions to the message [i.e., perceived threat])" (O'Keefe, 1990, pp. 167–168).

Second, contrary to hypothesis 2's predictions, as threat increased, so did fear, regardless of perceived or actual efficacy. Thus, only threat appears to be related to fear arousal, not efficacy. This finding is not surprising, in retrospect, given Witte's (1992a) argument that perceived efficacy only determines the *nature* of the response (i.e., danger or fear control), while perceived threat determines the *intensity* of the response (i.e., how much fear control or danger control outcomes). That is, because perceived threat and fear arousal appear to be closely intertwined (H1b), it is plausible perceived threat and the emotion fear work together to influence the intensity of a response to a fear appeal, instead of perceived threat working alone.

Third, the proposition that depictions of threat in a message lead to perceptions of threat, which in turn lead to fear arousal, received limited support (H1a). The test of this path model (i.e., message threat —> perceived threat —> fear) indicated that perceived threat mediates the relationship between message

threat and fear. In addition, the message directly influenced fear arousal, without cognitive mediation (Figure 2). Perhaps Zajonc's (1980, 1984) argument, that fear can be aroused without cognitions, is relevant here. In this study, written messages and photographs were combined to create the different levels of threat. It is plausible that the different forms of messages elicited different outcomes. For example, photographs, being more visceral and graphic, may have elicited emotional responses (i.e., fear) directly, without any cognitions. Conversely, cognitive processes may have been activated when individuals were compelled to process a written message. In the former case, visual messages would directly evoke fear arousal, while in the latter case, cognitions stemming from the message would precede the arousal of fear. Thus, the path model proposed in hypothesis 1a would be expected only when individuals had to process complex written or verbal messages (message threat—> perceived threat—> fear).

The Role of Fear in Message Acceptance

In general, fear is not related to message acceptance (H4). In this study, fear did not influence any of the message acceptance outcomes when the total sample was used. However, when those perceiving high efficacy were separated from those perceiving low efficacy, the indirect impact of fear on message acceptance emerged. As predicted by the EPPM, when individuals thought they could successfully avert a threat, fear was cognitively appraised and impacted estimates of threat, which in turn, influenced behaviors (H9c). In addition, the indirect relationship between fear and intentions, as mediated by perceived threat, surfaced for those perceiving high efficacy—although the mediation was not as strong for intentions (H9b) as it was for behaviors. Fear was totally unrelated to attitudes, regardless of perceived efficacy level (H9a). The behavioral results again lend support to the notion that perceived efficacy determines the nature of an individual's response to fear appeals (whether fear control or danger control processes are initiated). In other words, when fear is aroused, level of perceived efficacy determines whether further cognitions take place (i.e., whether fear is cognitively appraised) or whether cognitive processes are bypassed as people deal with their fear. Thus, perceived threat and fear should be stimulated to increase the intensity of responses to the fear appeal, but perceived efficacy must be strengthened to ensure that people accept the fear appeal's recommendations and the danger or threat is controlled.

Limitations

Even though the pattern of results was generally consistent with the EPPM, it is important to note that several of the specific hypotheses were not supported in this study. Thus, it is possible that parts of the model are incorrectly specified and in need of modification. As research into the EPPM continues, the incorrectly specified portions of the model should become more apparent and the model should be revised. In particular, great care must be taken when making predictions regarding the feedback loop. Specifically, *a priori* predictions must be made about the relationship between fear and message acceptance and rejection in order to keep the model falsifiable. It would be beneficial to test the

feedback loop with structural equation modeling so the entire model—including the feedback loop—could be tested simultaneously.

Practical Applications: Preventing HIV Infection

Persuasive strategies that effectively prevent AIDS among young people are sorely needed. Teens and young adults know how to prevent HIV transmission, but they continue to engage in risky sexual practices (e.g., Thomas, Gilliam, & Iwrey, 1989). Because fear appeals focus on *motivating* behavior change, they may be appropriate tools in the fight against AIDS. This study showed that threat and fear are effective in motivating AIDS-protective behaviors, *as long as individuals believe they can easily and effectively use condoms to prevent HIV contraction.* However, if threat and fear are too high and perceived efficacy of the recommended responses is too low, then individuals will minimize the threat of AIDS/HIV through defensive avoidance processes. This study suggests that individuals should be exposed to both fear-arousing written and visual content to motivate them to protect themselves against AIDS, but at the same time great care must be taken to emphasize effective and feasible AIDS prevention strategies.

Conclusion

Previous work has focused on explaining why and when fear appeals work. This study tested and found general support for the EPPM's predictions regarding why and when fear appeals fail. Overall, it appears that cognitions lead to message acceptance via the danger control processes, while the emotion fear leads to message rejection via the fear control processes. In addition, the results indicate that threat and fear work together in influencing the intensity of responses to fear appeals (e.g., how strong the message acceptance or rejection will be), while perceived efficacy determines the nature of those responses (e.g., *whether* message acceptance or rejection will occur). Fear appeals have great potential to achieve behavior changes—but they also can backfire. This study was a first attempt to uncover the mechanisms associated with both the success and failure of fear appeals.

ENDNOTES

[1]It is important to note that danger control responses are the same as adaptive and message acceptance responses (i.e., attitude, intention, behavior changes) and fear control responses are the same as maladaptive and message rejection responses (i.e., defensive avoidance, reactance). That is, by definition if one is engaging in maladaptive responses one is rejecting the message (e.g., if one is defensively avoiding the message one is not thinking of ways to avert the threat). It is recognized, however, that the terms adaptive and maladaptive responses are value-laden and may have multiple meanings. For example, defensive avoidance (a maladaptive response) may be an adaptive coping response to a hopeless situation. Because prior fear appeal research has adopted the terms "adaptive/maladaptive responses" (e.g., Rogers, 1983), it is difficult to discard these terms completely. However, in this manuscript, adaptive responses will be referred to as message acceptance responses, and maladaptive responses will be referred to as message rejection responses. The EPPM model has been changed accordingly.

[2]A no-message control group was included in the overall study to assess existing population perceptions of threat and efficacy. Although control groups are not utilized in factorial designs (unless they act as a level of a factor), some readers may be interested in these findings. At both the posttest and 6-week follow-up, the no-message control group subjects had moderate perceptions of threat toward AIDS ($M = 4.2$ and $M = 4.32$, respectively, on a 7-point scale). Efficacy perceptions toward condom use were moderately strong at both the posttest and six-week follow-up ($M = 5.19$ and $M = 4.93$, respectively). Dunnett's test to compare experimental means against control means indicated that

perceived threat and perceived efficacy did not differ significantly between experimental and control subjects for either the posttest or follow-up.

[3]Indirect effects are calculated as $p_{21}p_{32}$ (.39 × .43; Asher, 1983; Cohen & Cohen, 1983). While no formal significance test for indirect effects exists, according to Cohen and Cohen (1983), we may assume the indirect path is significant, because "a sufficient condition" for significant indirect effects "would be met whenever the effects being multiplied to produce the indirect effects are each significantly different from zero" (Cohen & Cohen, 1983, p. 366). Thus, when each of the paths in a model are significantly different from zero, we can assume that the indirect effect of variable A on variable C is significant.

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