Testing the Theoretical Design of a Health Risk Message: Reexamining the Major Tenets of the Extended Parallel Process Model

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This study examined the fear control/danger control responses that are predicted by the Extended Parallel Process Model (EPPM). In a campaign designed to inform college students about the symptoms and dangers of meningitis, participants were given either a high-threat/no-efficacy or high-efficacy/no-threat health risk message, thus testing the extreme assumptions of the EPPM. Although the study supports the main predictions of the EPPM in the context of meningitis, the results provide new evidence that only a marginal amount of threat is necessary in a health risk message to move the target audience toward the desired protective measures. In addition, the results also suggest that the messages containing only threat may only scare the target audience further into fear control. Implications and future research are discussed.

Keywords: *Extended Parallel Process Model; meningitis; health campaigns*

Meningitis is an infection of the layers of tissue (*meninges*) that cover the brain (*dura mater*, *arachnoid*, *pia mater*) and spinal cord (Kunz, 1982). Meningitis occurs when bacteria or viruses travel through the blood to the meninges causing an inflammation to the membranes (Gard, 2003). There are two distinct types of meningitis: *viral* and *bacterial*. Viral meningitis is more common and less serious than bacterial meningitis and is spread from person to person through the air. The bacterial form is transmitted through the air via droplets of respiratory secretions and direct contact with an infected individual, such as exposure to coughing, kissing, sneezing, or immediately sharing an unwashed eating utensil, and is far more dangerous (Meningitis Foundation of America, n.d.). The Centers for Disease Control and Prevention (CDC, n.d.) state that meningitis is a potentially devastating disease that can result in blindness, deafness, amputations, permanent brain damage, or even death.

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MENINGITIS AND COLLEGE STUDENTS

The primary group that the CDC is targeting for vaccination against bacterial meningitis is college students, especially students who live in dormitories. Studies have shown that 18- to 22-year-olds are at greater risk of contracting meningococcal meningitis, a type of bacterial meningitis. In recent years, there has been a significant increase in the number of cases of this type of meningitis reported on college campuses (Bruce, 2001). It is estimated that 100 to 125 cases of meningococcal meningitis occur annually on college campuses, and 5 to 15 students die as a result (Meningitis Foundation of America, n.d.). Students are at a potentially high risk for contracting meningitis because of their lifestyle situation, such as the sharing of generally small cramped quarters (i.e., dormitories or small efficiency apartments), bar patronage, smoking, poor nutrition intake, shared eating utensils, and irregular sleep patterns (Meningitis Research Foundation, n.d.).

It has been shown that vaccination greatly decreases the risk of certain forms of bacterial meningitis (85% effective) especially among college students, but also among the general public (Gard, 2003). However, the cost ($65 to $85) for a vaccination might prove prohibitive to a great number of people, especially young adults in their first year of college. Furthermore, students may decline to be vaccinated not only because they seek to save money but also because they do not believe they are susceptible to this disease. The CDC now recommends (since July 2000) that college freshmen living in dormitories should be told about the risks of contracting meningitis and that vaccination should be made available to those who want it.

EXTENDED PARALLEL PROCESS MODEL

Fear appeals (persuasive threat messages that evoke some level of fear) have been used successfully to disseminate various types of information to the general public. In the health arena, fear appeals can be found in drinking and driving advertisements, AIDS awareness posters, seatbelt compliance laws, antismoking campaigns, antidrug messages, and even dentists' offices (Perloff, 2003).

The Extended Parallel Process Model (EPPM) (Witte, 1992) is the most recent fear appeal theory that attempts to explain when and why these persuasive messages may work or fail (Witte, 1992, 1994, 1998; Witte & Allen, 2000). The model offers a dual/parallel approach to explain how individuals process and respond to threatening messages (see Figure 1). The EPPM addresses both the emotional and cognitive factors associated with message processing and relates these processes to a fear appeal's success or failure (Witte, 1992, 1994). Witte used prior fear appeal theory and enlisted and expanded on Leventhal's (1970) Parallel Process Model as the basic framework for the EPPM. She drew on Rogers's (1975, 1983) Protection Motivation Theory to explain the danger control aspect (i.e., when and why fear appeals work) and portions of Janis's (1967) Fear-As-Acquired Drive Model for the fear control component of the model (i.e., when and why fear appeals fail).

According to the main tenets of the EPPM, when an individual is exposed to a fear appeal, two cognitive appraisals of the message will occur: First, the "appraisal of the threat" and second, the "appraisal of the efficacy of the message's recommended response" (Witte, Meyer, & Martell, 2001, p. 24), or as Perloff (2003) suggested, as a problem (threat) and solution (efficacy information). Rosenstock (1974) noted that susceptibility and severity are two critical dimensions of perceived threat. Susceptibility

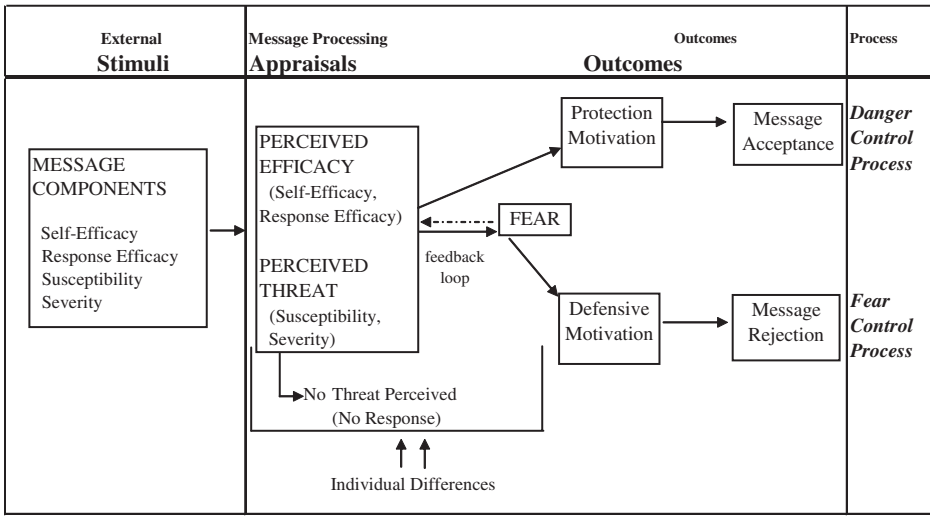

Figure 1. The Extended Parallel Process Model.
SOURCE: Used with permission from Kim Witte.

refers to one's subjective perception of the risk of contracting a health condition (e.g., college students are at risk for contracting meningitis), whereas severity indicates one's feelings concerning the seriousness of contracting an illness (e.g., meningitis is a potentially fatal disease) and its subsequent social consequences (i.e., effects of the conditions on work, family life, and social relations). The EPPM emphasizes two different types of efficacy: response efficacy and self-efficacy. Response efficacy pertains to beliefs about the effectiveness of the recommended response in deterring the threat (e.g., "a meningitis vaccination will make it less likely that I will contact the disease"). Self-efficacy (Bandura, 1977) is a person's perception of his or her ability to perform the recommended response to avert the threat (e.g., "I am able to get a meningitis vaccination") (Rogers, 1975, 1983; Witte, 1998; Witte et al., 2001).

These two appraisals will result in one of three outcomes: (1) no response, (2) acceptance, or (3) rejection of the message (Witte et al., 2001). The EPPM infers that after exposure to a fear appeal, individuals will first appraise the threat of the message. If the threat is perceived to be high (high susceptibility and/or high severity), then fear is elicited (Easterling & Leventhal, 1989; Lang, 1984), and there is motivation to begin the second appraisal, the evaluation of the efficacy of the recommended response (Witte, 1992).* If the threat is perceived as irrelevant/low, or insignificant/trivial, then there is no motivation to process the message, efficacy is not evaluated, and there is no response to the appeal (Witte, 1992).

The EPPM predicts that if a perceived threat is high (eliciting some level of fear) and depending on the level of efficacy appraised, individuals will follow one of two separate pathways: *danger control processes* or *fear control processes* (Witte et al., 2001). When perceived threat and efficacy are high, individuals will follow the course of danger con-

*Fear has been defined as a negative emotion, often accompanied by a high level of arousal, and is frequently elicited by a perceived threat (Easterling & Leventhal, 1989; Lang, 1984; Ortony & Turner, 1990).

trol, meaning they will focus cognitively on dealing with the threat and possible solutions to avert the threat. When perceived threat is high, but efficacy (self and/or response) is low, individuals will follow the course of fear control. In fear control, they will let their emotions take over and use maladaptive coping mechanisms to allay their fears, such as denial, reactance, or avoidance (Witte, 1992, 1994, 1998; Witte et al., 2001). According to Witte, a successful fear appeal should lead individuals down the path of danger control where they evaluate the threat and strive to control the danger and not be guided solely by their emotions.

One important concept of the EPPM is the critical point that occurs when perceptions of the threat portion of a message begin to outweigh perceptions of the efficacy of the recommended response (Witte, 1992). Such perceptions will often cause individuals to shift from danger control responses (cognitively controlling the danger, e.g., doing something positive about the threat such as following the recommended response) to fear control responses (letting emotions dominate the thought process, e.g., denying their own perceived susceptibility). In other words, the critical point occurs when individuals start to believe that they cannot avoid a significant threat from happening. Then and only then will they give up controlling the danger and begin to control their fear (Witte, 1992, 1994; Witte et al., 2001).

IMPORTANCE OF CURRENT STUDY

The EPPM has been tested using a variety of research methods such as experiments, focus groups, and surveys and has covered a multitude of topics, including skin cancer (Stephenson & Witte, 1998), HIV/AIDS prevention (Casey, 1995; Murray, Hubbell, Witte, Sampson, & Morrison, 1998; Murray-Johnson, Witte, Liu, & Hubbel, 2001; Witte, 1992, 1994; Witte, Cameron, Lapinski, & Nzyuko, 1998; Witte & Morrison, 1995), teen pregnancy (Witte, 1997), genital warts (Witte, Berkowitz, Cameron, & McKeon, 1998; Witte, Cameron, McKeon, & Berkowitz, 1996), breast cancer (Kline, 1995), radon awareness (Witte, Berkowitz, McKeon, et al., 1998), and even tractor safety (Witte et al., 1993).

In addition, EPPM studies have focused on many different populations, including high school students (Murray et al., 1998), juvenile delinquents (Witte & Morrison, 1995), college students (Witte, 1992, 1994; Witte, Berkowitz, Cameron, et al., 1998), African Americans (Witte et al., 1996), farmers (Witte et al., 1993), and Kenyan prostitutes (Witte, Cameron, et al., 1998).

Previous research on fear appeals has led to conflicting recommendations regarding the most effective way to persuade audiences. The results of prior EPPM studies have consistently found that successful fear appeals should contain a high-threat message and even higher amounts of efficacy (i.e., self and response) to promote danger control responses. However, many fear appeal messages still are created that do not incorporate the EPPM recommendations. This study attempted to address previous suggestions that fear appeal studies increase ecological validity by using real-world settings. Therefore, this experiment was designed to specifically test the major tenets of the EPPM in extreme cases by polarizing threat and efficacy conditions to resemble messages found in real-life situations. Specifically, this study examined how college students would react if they were exposed to a unique health risk threat (meningitis). One group received a high-threatening message with no recommendation as to how to avoid the disease or any means to assuage their fears, whereas a second group was exposed to a high-efficacy message

that contained very little threat about the dangers of exposure to this disease. Therefore, respondents' fear control and danger control processes were examined looking at the fear control/danger control shifts in relation to those predicted based on the EPPM.

HYPOTHESES AND RESEARCH QUESTION

The following hypotheses and research question based on the EPPM were examined:

Hypothesis 1: After exposure to a high-efficacy/no-threat health risk message about meningitis, those participants who initially held fear control responses (low-efficacy perceptions) will move toward danger control processes.

Hypothesis 2: After exposure to a high-threat/no-efficacy health risk message about meningitis, those participants who initially held fear control responses (low-efficacy perceptions) will move further into fear control processes.

Hypothesis 3: After exposure to a high-threat/no-efficacy health risk message about meningitis, those participants who initially held danger control responses (high-efficacy perceptions) will move toward fear control processes.

Research Question 1: After exposure to a high-efficacy/no-threat health risk message about meningitis, would those participants who initially held danger control responses (high-efficacy perceptions) move further into danger control processes?

METHOD

A between- and within-group 2 (response [i.e., fear or danger]) × 2 (stimuli [i.e., threat or efficacy]) experimental design was employed. It examined how two health risk messages regarding meningitis, designed with the EPPM as their theoretical baseline, may have motivated certain individuals toward self-protective measures.*

Participants

As previously noted, meningitis primarily strikes college students, especially those living in a dormlike environment. Therefore, only college students were asked to participate in this study. A total of 145 students attending a midwestern university in the fall semester of 2002 were recruited for this study. On the basis of previous research, this high-risk target group could all be likely candidates for contracting meningitis. The majority of the sample group included students enrolled in a general communication course.

Students who participated in this study were not told why they were selected and informed that they would have an opportunity to receive extra credit for participating in a health message lecture. In addition, students recruited for this experiment were not provided with prior knowledge that the topic of meningitis would be discussed in their class. Participants ranged in age from 18 to 57 ($M = 22.62$, $SD = 5.52$), 56% were female ($n = 82$), and 44% were male ($n = 63$). Nearly all of the participants ($n = 105$) were Caucasian (72.4%), 22.1% were African American ($n = 32$), 3.4% were Arab ($n = 5$), and 2.1% clas-

*By conducting this experiment, it was also hoped that some college students exposed to these messages would be educated and persuaded toward vaccination against the disease meningitis.

sified themselves as other. In addition, 20.7% of the participants were freshman ($n = 30$), 19.3% were sophomores ($n = 28$), 28.3% were juniors ($n = 41$), and 31.7% were seniors ($n = 46$). Out of the 145 participants, 25.5% stated that they had known someone who had contracted meningitis, and 5.5% stated that they had known someone who had died from the disease.* None of the respondents themselves had been diagnosed with meningitis.

Instrument

The participants completed pre- and posttest self-report paper-and-pencil questionnaires. The questionnaires each contained items inquiring about their knowledge of meningitis, attitudes toward vaccination against the disease, and the Risk Behavior Diagnosis Scale (RBD).

Independent Variables

Health Risk Messages

Two health risk messages were developed for this study: a high-fear and a high-efficacy message. The first, a high-fear message, focused only on the threat aspect of meningitis (i.e., susceptibility and severity) and used vivid, threatening language (e.g., "You are susceptible to the deadly disease meningitis, and if contracted, you may suffer a horrible death!"). The second, a high-efficacy message, highlighted only the recommended response of avoiding the disease (i.e., response and self-motivation) and used upbeat, nonthreatening language that explained how to perform the recommended response (e.g., "Getting a meningitis vaccination shot is easy and affordable—just visit the university's Health Service Department").

In addition, the second message addressed barriers to performing the recommended response and gave evidence of the recommended response's effectiveness and how easy it was to carry out.

Manipulation Check. A manipulation test was conducted prior to the implementation of the complete study based on the two health risk messages. The manipulation test assisted in determining the validity of the content in each fear appeal. The manipulation checks applied to this study were conducted with different participants than those who participated in the actual study. For the manipulation check, one group of participants ($n = 12$) received a high-threat/no-efficacy message (susceptibility and severity), whereas another group of participants ($n = 12$) received a high-efficacy/no-threat message (response efficacy and self-efficacy). A posttest questionnaire was specifically designed for the manipulation test and included eight questions assessing whether participants thought the health practitioner's lecture highlighted perceived susceptibility (e.g., "it is possible that I may contracted meningitis"), perceived severity (e.g., "meningitis is a serious disease"), and level of efficacy (e.g., "getting vaccinated prevents meningitis" and "the vaccination is easy to obtain").

Immediately following the manipulation, each participant completed a specifically designed posttest manipulation questionnaire. The data were analyzed using an independent samples t test. The manipulation checks indicated that the manipulations were

*Analysis revealed that participants who reported knowing someone who had either contracted or died from meningitis did not respond to the manipulation in a significantly different manner.

effective. Participants who received a high-threat/no-efficacy health risk message reported more fear (M = 6.2), whereas participants who received a high-efficacy/no-threat message reported that the message created less fear (M = 3.5). The difference between the two groups was significant (t = 4.7, df = 22, $p \leq .001$). Participants who received a high-efficacy/no-threat health risk message reported higher perceptions of efficacy (M = 6.6), whereas participants who received a high-threat/no-efficacy message reported lower perceptions of efficacy (M = 1.9). The difference between the two groups was significant (t = –14.8, df = 22, $p \leq .001$).

The manipulation check revealed that those participants who received the high-threat/no-efficacy message believed meningitis to be severe and that they are susceptible to it; however, they had lower perceptions of efficacy. Those participants who received the high-efficacy/no-threat message believed that a vaccination was effective and that they had the ability to receive one; however, they had lower perceptions of the severity of the disease or their susceptibility to it. Therefore, the same fear appeal messages were used in the actual experiment.

Risk Behavior Diagnosis Scale

The Risk Behavior Diagnosis Scale (RBD)* is a 12-item, 7-point Likert-type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) (Witte et al., 1996). The scale was developed to use all aspects of the EPPM as its theoretical baseline. The RBD asks individuals three questions each about their perceived attitudes toward susceptibility, severity, self-efficacy, and response efficacy toward a certain behavior or topic. The analysis enables a researcher to identify whether an individual (or individuals) is (are) in fear control or danger control processes before or after exposure to a health risk message. The results from the RBD allow researchers to create an effective message directed toward their target audience. The following scales assessed the stage of a particular individual regarding danger control or fear control toward the disease meningitis.

Severity. Participants rate the following three items on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*): "Meningitis is a serious threat," "Meningitis is harmful," and "Meningitis is a severe threat." Pretest Cronbach's alpha = .91, and posttest = .88.

Susceptibility. Participants rate the following three items on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*): "I am at risk for meningitis," "It is possible that I will get meningitis," and "I am susceptible to meningitis." Pretest Cronbach's alpha = .85, and posttest = .91.

Response Efficacy. Participants rate the following three items on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*): "Getting vaccinated prevents meningitis," "Getting vaccinated works in deterring meningitis," and "Getting vaccinated is effective in removing the threat of meningitis." Pretest Cronbach's alpha = .87, and posttest = .92.

Self-Efficacy. Participants rate the following three items on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*): "I am able to get a vaccination to prevent against meningitis,"

*The Risk Behavior Diagnosis Scale (RBD) was used in this study as an independent variable to measure preexisting fear/danger control responses and as a dependent variable to measure any changes to the participants' fear/danger control responses after exposure to the manipulation.

"It is easy to get a vaccine to prevent against meningitis," and "I can get a vaccine to prevent against meningitis." Pretest Cronbach's alpha = .95, posttest = .96.

Procedures

Two different health scripts were designed to be presented by a confederate posing as a health care practitioner. Eight groups, containing approximately 15 to 25 students, were randomly assigned to either a high-threat/no-efficacy or high-efficacy/no-threat manipulation. Participants were told they were going to be exposed to an important health message and that they should listen quietly and hold all questions until the end.

After entering each classroom, the confederate introduced herself and stated that she was affiliated with a local hospital organization (a true statement).* In her initial introduction (while distributing consent forms), she stated that the purpose of her visit was to talk about meningitis and that she was involved in a study about this topic.

She first disseminated a pretest questionnaire to all participants. After all pretest questionnaires had been collected, the confederate then gave a 12-minute memorized lecture about meningitis. The lecture was based on a previously written and approved script. Four groups of students were exposed to a high-threat/no-efficacy message lecture (n = 74), whereas the other four groups were given a high-efficacy/no-threat message lecture (n = 71). Immediately following the lecture, the confederate distributed a posttest questionnaire. The pre- and posttests had matching numbers to allow the researchers to track the participants' responses.

After collecting each posttest, the confederate then disseminated a brochure created specifically for this experiment to each participant providing him or her with additional information about meningitis. All information in both content message types and brochures was accurate using information supplied by the CDC, the Meningitis Foundation of America, and from the Meningitis Research Foundation. While distributing the brochure, the confederate then verbally highlighted susceptibility and severity of the disease to the treatment group who received the high-efficacy/no-threat condition and response and self-efficacy to the treatment group who received the high-threat/no-efficacy condition.

Data Analysis

Because this study used a between-groups design comparing individuals in two separate groups (high-threat/no-efficacy and high-efficacy/no-threat) and a within-groups design (fear and danger control), comparing pre- and posttest scores over time, a repeated measures profile analysis was used.

SPSS for Windows version 11.0 was used to segment those participants who received either the high-threat/no-efficacy or the high-efficacy/no-threat manipulation. In addition, participants were further identified and separated as to whether their discriminating values (discriminates between fear control and danger control) revealed preexisting fear or danger control responses about meningitis.** Pre- and posttest scores were analyzed,

*To further enhance credibility, the confederate wore a white lab coat and had a stethoscope draped around her neck.

**Discriminating values are calculated by subtracting combined perceived threat scores from combined perceived efficacy scores. Positive values = danger control responses; negative values = fear control responses (Witte et al., 1996).

Table 1. Summary of Results

Hypotheses and Research Question	*F*	*p*	Pretest *M*	Posttest *M*
Hypothesis 1: high efficacy/no threat into danger control	.278	.001	–10.30	5.51
Hypothesis 2: high threat/no efficacy further into fear control	.718	.001	–9.50	–16.18
Hypothesis 3: high threat/no efficacy into fear control	.420	.001	6.10	–7.13
Research Question 1: high efficacy/no threat further into danger control	1.00	.954	6.59	6.47

and, using SPSS, the appropriate subgroups were selected to test the corresponding hypotheses. Afterward, a repeated measures profile test was conducted to measure the effectiveness and validity of the model, to determine whether participants' discriminating values had changed, and to assess possible attitude change toward vaccination.

RESULTS

Hypothesis 1, which predicted that after exposure to a high-efficacy/no-threat health risk message about meningitis, those participants who initially held fear control responses (low-efficacy perceptions) will move toward danger control processes, was found by Wilks's criterion to deviate significantly from parallelism, $F(1, 36) = .278$, $p < .001$, partial $\eta^2 = .722$. On the basis of mean scores, participants who initially scored negative discriminating values ($M = -10.30$) on a pretest questionnaire about meningitis (i.e., fear control responses) scored positive discriminating values ($M = 5.51$) after receiving a high-efficacy/no-threat condition (i.e., danger control responses). Therefore, it can be determined that a high-efficacy/no-threat health risk message about meningitis moved the participants (who initially held fear control responses) toward danger control responses regarding vaccination. Thus, the data support Hypothesis 1.

Hypothesis 2, which predicted that after exposure to a high-threat/no-efficacy health risk message about meningitis, those participants who initially held fear control responses would move further into fear control processes, was found by Wilks's criterion to deviate significantly from parallelism, $F(1, 43) = .718$, $p < .001$, partial $\eta^2 = .282$. Based on mean scores, participants who initially scored negative discriminating values ($M = –9.50$) on a pretest questionnaire about meningitis (i.e., fear control responses) scored even higher negative discriminating values ($M = –16.18$) after receiving a high-threat/no-efficacy condition (i.e., higher fear control responses). Therefore, it can be determined that a high-threat/no-efficacy health risk message about meningitis moved participants (who initially held fear control responses) further into fear control regarding vaccination. Thus, the data support Hypothesis 2. Table 1 represents the statistical results in graphic form for Hypotheses 1 and 2.

Hypothesis 3, which predicted that after exposure to a high-threat/no-efficacy health risk message about meningitis, those participants who initially held danger control responses (high-efficacy perceptions) will move toward fear control processes, was found by Wilks's criterion to deviate significantly from parallelism, $F(1, 29) = .420$, $p < .001$, partial $\eta^2 = .580$. On the basis of mean scores, participants who initially scored posi-

tive discriminating values ($M = 6.10$) on a pretest questionnaire about meningitis (i.e., danger control responses) scored negative discriminating values ($M = -7.13$) after receiving a high-threat/no-efficacy condition (i.e., fear control responses). Therefore, it can be determined that a high-threat/no-efficacy health risk message about meningitis moved these individuals (who initially held danger control responses) toward fear control responses regarding vaccination. Thus, the data support Hypothesis 3.

Research question 1, which asked if after exposure to a high-efficacy/no-threat health risk message about meningitis, those participants who initially held danger control responses would move further into danger control processes, was found by Wilks's criterion not to deviate significantly from parallelism, $F(1, 33) = 1.00$, $p = .954$, partial $\eta^2 = .001$. The results determined that there was very little difference. On the basis of mean scores, participants who initially scored positive discriminating values ($M = 6.59$) on a pretest questionnaire about meningitis (i.e., danger control response) also scored positive discriminating values ($M = 6.47$) after receiving a high-efficacy/no-threat condition (i.e., danger control responses). Therefore, it can be determined that a high-efficacy/no-threat health risk message about meningitis had almost no effect on participants' attitude toward vaccination who initially held danger control responses.

DISCUSSION

Overall, the pattern of results for this study was consistent with the EPPM's main predictions. The results confirmed the major tenets of the EPPM in a novel application, meningitis. According to prior research conducted on the EPPM, results have demonstrated that a threatening message that portrays the consequences of engaging in destructive behaviors can be effective as long as the message also includes a high-efficacy component (Stephenson & Witte, 1998; Witte, 1992, 1994; Witte, Berkowitz, McKeon, et al., 1998).* The primary conclusion from this study was that a very high-efficacy message coupled with a very low-threat counterpart was *still* enough to move individuals from fear control responses to danger control processes. After receiving the high-efficacy message, individuals who originally held fear control responses toward meningitis cognitively appraised the message's recommendations, assessed their own abilities of self-efficacy, and moved toward danger control processes. As a result, these individuals may have formed favorable attitudes about receiving a vaccination. The evidence from this study supports Hypothesis 1.

Hypothesis 2 argued that a threatening message alone without any means of reducing the threat (or a person's fear) would send individuals who initially held fear control responses into further fear control processes. The evidence from this study clearly demonstrates that this was the outcome. After exposure to a high-threat message about meningitis with no efficacy for reducing the threat, individuals who initially held preexisting fear control responses reacted simply according to their emotions in order to control the fear of the proposed threat. According to the EPPM, these participants evaluated the efficacy of the recommended response (which was not provided) and therefore, rather than seeking the ability to control the danger, they strove to control the fear and reverted even further into fear control processes. Fear control responses were further reinforced after

*The authors contend that it is possible to compare threat and efficacy as suggested by Witte. It seems likely that individuals compare the two (threat and efficacy) as they would when making any decision where a threat exists, that is, they question which action represents the larger threat at that moment.

receiving a high-threat message containing no efficacy because individuals felt there was very little, if anything, they could do to prevent meningitis. By trying to control their fears, these individuals may have rejected the message or may have believed it to be overexaggerated. The results of this study support Hypothesis 2 (exposure to a high-threat/no-efficacy health risk message will move individuals who initially held fear control responses further into fear control) and reinforced the EPPM's major suggestions of efficacy: Perceptions of efficacy must be higher than perceptions of threat for fear appeals to be accepted by their viewers (Witte, 1992, 1994; Witte et al., 2001).

Hypothesis 3 and Research Question 1 addressed preexisting danger control processes. Hypothesis 3 stated that a high-threat message about meningitis with very little to no efficacy would move individuals who initially held danger control responses toward fear control processes. The evidence from this study clearly demonstrates that this was the result. When individuals scored positively on the RBD, indicating they were in danger control, they may have needed threatening messages highlighting susceptibility and severity to motivate them to further action. Individuals who had preexisting danger control responses had an adequate amount of high perceptions of efficacy to counteract their threat perceptions. To elicit self-motivation and protective behaviors, future fear appeals should highlight how these individuals may be susceptible to a particular threat and, in addition, focus on how severe the threat may be (Witte et al., 2001).

As stated above, Hypothesis 3 argued that a meningitis health risk message that solely focused on susceptibility and severity (high threat) with no efficacy would move those individuals who initially held preexisting danger control responses to fear control processes. The data from this study demonstrated that this situation did indeed occur. The results confirmed that high-threatening messages that stand alone without any means of efficacy can heighten audience members' perceptions of susceptibility and severity. However, the results suggest that individuals who initially held preexisting danger control responses may move toward and remain in fear control because they are given no means for allaying the threat or their perceived fears.

As already noted, the critical point occurs when perceptions of threat begin to outweigh perceptions of efficacy, causing individuals to shift from danger control responses to fear control processes (Witte, 1992). This occurs when individuals start to give up controlling the danger and instead turn to controlling their fear. The goal of the EPPM is to always move individuals toward danger control processes. If individuals hold preexisting danger control processes, health practitioners should focus their messages on increasing beliefs of susceptibly and severity. However, the message should not contain such a threat condition as to move these people across the 0-point line into a negative discriminating value (i.e., fear control). The results from this study indicate that this is exactly what happened. A high-threatening message about meningitis without any means of reducing the threat (no efficacy) caused those individuals that initially held preexisting danger control responses (cognitively evaluated the threat and their own perceived efficacy) toward fear control responses (controlling their fears through emotional processing that elicited maladaptive responses).

As stated throughout, according to the EPPM, high-threatening messages coupled with high-efficacy, easy-to-accomplish recommendations are usually an effective means for reducing the threat, eliminating fear, and moving individuals toward protection motivation. Based on a limited amount of research (preexisting danger control and low-threat/high-efficacy message processing), this study questioned how respondents who initially held preexisting danger control responses about meningitis would react after exposure to a high-efficacy message with very little to no threat about this disease.

The results demonstrated that there was no significant change in these individuals. Those participants who held preexisting danger control responses stayed in danger control and only moved very minimally toward fear control (pretest mean scores 6.59; posttest mean scores 6.47). The results of this study further substantiate the EPPM's main predictions of danger control processes in relationship to threat and efficacy. These individuals (preexisting danger control responses) already possessed high-efficacy perceptions regarding meningitis and with the absence of a threat were not motivated to action regarding vaccination. Without a threatening message, these individuals disregarded their perceived susceptibility to, and severity of, this potentially life-threatening disease. These participants may have believed they had all of the information pertaining to meningitis; however, they still required some form of threat to move them toward action. This study further demonstrated that to move individuals (who initially held preexisting danger control processes) toward self-protective behaviors, fear appeals must contain high levels of threat (to promote increased self-perceptions of susceptibility and severity). However, the threat message should not be so extreme as to move these individuals into fear control processes as was evidenced with the participants (those holding preexisting danger control process) who were exposed to a threatening message without any recommended response.

Limitations

One limitation of this study was that an additional posttest questionnaire was not given after a period of time (e.g., a 2-week interval). It was decided that the university's health service department would anonymously track inquiries about the meningitis vaccine and that these data would act as a second posttest.*

One disappointing outcome of this study was that Health Services reported that no students who were involved in this study received a meningitis vaccination from their office, in part because they were out of the vaccine. It was discovered that the meningitis vaccine they carried was ineffective against one strain of bacteria, and all were sent back to their supplier.

Although the particular nature of the campus employed for this study was chosen for the small number of students who live on campus, there were even fewer students ($N = 12$) recruited for this study who actually lived in a dormitory on campus. Past research on meningitis has revealed that college students, especially living in dormitories, are more susceptible to meningitis. It was hoped that a great many of the students recruited for this study actually lived on campus. However, the campus in which this study occurred is not a residential university and thus does not mandate a required meningitis vaccine. Perhaps a majority of the participants recruited for this research live in a dormitory-like situation and did still benefit from this study.

Implications for Practice

Early-fear-appeal researchers often wondered how much threat revealed in a fear appeal is too much. Janis and Feshbach (1953) discovered that too little threat did very little to motivate action; however, these researchers soon discovered that too much threat

*By consenting to this study, students were made aware that the university's health service department would have on record their student identification number tracking their pre and post discriminating values. All information was kept confidential.

had a negative effect as well. Their recommendation was that a fear appeal should provide just enough threat to motivate action but not too much as to promote psychological defenses. This present study found important evidence that a very low threat coupled with a high-efficacy counterpart promoted just enough fear to move some individuals toward protective attitudes. However, these results also revealed that too little threat coupled with a high-efficacy message did little to persuade some individuals toward any action. Furthermore, this study revealed that too much threat, coupled with a low-efficacy message, incited too much fear and moved some individuals toward maladaptive responses. These facts become increasingly important for health practitioners developing health risk messages. The results from this study demonstrated that practitioners can very simply move individuals from fear to danger control processes with high-efficacy messages; however, the use of high-threatening messages may inadvertently move people from danger to fear control.

To design an effective health risk message based on the EPPM, a researcher must evaluate a person's threat and efficacy attitudes toward a particular health risk message. Health practitioners can use the RBD to accomplish this task. After determining an individual's discriminating value, a health practitioner can then adjust the message to attain danger control responses.

Research has indicated that an effective and successful fear appeal needs to be designed based on certain theoretical guidelines, not just "hatched" haphazardly as a good idea. In addition, fear appeals often succeed when they furnish workable, practical solutions to distinct problems directed at a specific target audience. Practitioners must be made aware that for fear appeals to be effective, they must include some sense of hope for their reader or viewer. If there is no belief in a remedy to a potential health risk, why should the information be heeded? Fear appeals often succeed when individuals are apprized of their risks along with possible feasible treatments and solutions. Fear appeals can only produce the desired results when they are extensively researched and provide all of the information needed for consumers to make well-informed decisions regarding their health.

This research study was conducted to test the extreme parameters of the EPPM in order to mimic real-life situations and was successful in predicting how participants would react when exposed to one of two fear appeals according to their initial control. It must be reiterated that previous research has shown that the most efficacious and potentially successful fear appeal should contain high levels of threat and even higher levels of a prescribed solution in order to change potentially destructive behavior patterns, consistent with prior EPPM findings. However, the results of this study demonstrated that even when threat and efficacy perceptions are polarized, fear and danger control responses can be predicted, thus giving further credence to this relatively new theory.

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