

## Article

# The Effects of Fear Appeals and Message Format on Promoting Skin Cancer Prevention Behaviors among College Students

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Received: 20 December 2019; Accepted: 3 February 2020; Published: 22 February 2020



**Abstract:** This study tested the Extended Parallel Process Model (EPPM) by examining how fear mediated the effects of threat on individuals' assessment of risk, which was neglected in many fear appeal studies. Second, this study treated efficacy as an existing perception, and explored the effects of varying levels of threat and efficacy on individuals' behavioral intention. Furthermore, this study examined whether message format, such as narratives, played a role on individuals' behavioral intention. Implications for the EPPM and health message development were discussed.

**Keywords:** the EPPM; fear appeals; efficacy; narrative health; health communication

Skin cancer is one of the most common types of cancer in the United States, and affects both females and males almost equally [1]. In 2008, the incidence of skin cancer was 62,480 in the United States, with mortality at 8420 [2]. Among the populations susceptible to skin-related disease, college students are a vulnerable population often engaging in unhealthy lifestyles and risky behaviors [3]. In spite of its severity, college students are not paying enough attention to the consequences of skin cancer. A vast majority of them maintain favorable attitudes toward tanning and tanned appearances, and express little concern about developing skin cancer [4,5]. Many college students are not aware of the fact that a tanned appearance does not indicate good health [6]. Thus, skin cancer as a health threat is not only a prominent health hazard, but also relevant to college students. More effective messages and adequate development of interventions aimed at highlighting the risks associated with skin cancer and promoting preventive behaviors among college students are essential.

In health communication scholarship, one of the most frequently employed emotions is fear [7]. Fear is a negatively-valenced emotion and is more likely to be evoked from the perception of danger and threats [8–10], and it may result in health attitude and behavior change [11,12]. In researching message effects associated with threats, fear as a discrete emotion was frequently used, and was often accompanied by strongly defensive behaviors to avoid the harmful situation [13–15]. In the Extended Parallel Process Model (EPPM), Witte [16] conceptualized fear appeal as the message describing the terrible consequences of not performing the recommended action in the message. In health messages, fear appeal has been used when the message producer intended to inform the public about the severe consequences that unhealthy behavior or a disease may induce, thus expressing a causal relationship between fear and its consequences [17].

The EPPM included both message components and cognitive processes related to fear appeals, and it was proposed based on the perspective that fear control was more cognitive than emotional [13,16]. The EPPM has been used to investigate in a variety of health topics including cardiovascular disease prevention [18], reducing noise-induced hearing loss [19], colonoscopy screening promotion [20], skin cancer prevention [21], general TV health news processing [22], and promoting breast cancer screening [9]. Although the EPPM is an effective theoretical framework in fear appeal studies, there are still gaps to be filled in the model.

This study attempts to further test the EPPM. First, this study highlights the role of fear in the threat messages and examines how fear mediates the effects of threat on individuals' risk evaluation, which was neglected in many fear appeal studies. Second, instead of manipulating self-efficacy and response efficacy in the message, this study attempts to operationalize efficacy as an existing trait, and explores the effects of varying levels of threat in the message and reported efficacy on individuals' message acceptance. Furthermore, this study examines when threat is high, whether message format such as narratives conjunctively plays a role on individuals' message perception.

## 1. Literature Review

### 1.1. The Role of Fear in the EPPM

The EPPM [16] has gained increasing scholarly attention and becomes an important theoretical guidance for the examination of fear components in health messages. The EPPM proposed that fear appeals should be conceptualized from at least two distinct perspectives: message content and audience reactions [8,16]. With that being said, fear should not be the sole variable in fear appeal manipulations. Instead, threat and perceived efficacy are also considered as key variables in fear appeals research [23]. Nabi and Wirth [24] noted that the cognitive component, that is "how situations relevant to emotions were perceived and evaluated" (p. 4) was neglected in prior fear appeal research. The EPPM specified not only the emotional component (fear control response) but also the cognitive component of fear appeals (danger control response). In addition, the role of fear as a mediator was highlighted in the process of accepting the recommended behavior in the message.

The EPPM incorporated two broad variables: threat and efficacy. Perceived threat was composed of two aspects: perceived severity of the threat and perceived susceptibility to the threat. Perceived severity referred to the dangers or consequences of the threat, perceived susceptibility referred to the likelihood that the threat was going to occur. Perceived efficacy involved response efficacy and self-efficacy. Response efficacy referred to the effectiveness of the recommended behavior, and self-efficacy involved the capability and resources that the individual had to engage in the recommended behavior [18].

The EPPM predicted an interaction between threat and efficacy with fear control and danger control processes. Generally, individuals responded to a fear appeal message in one of the three ways. First, when the perceived threat was low, individuals would ignore the message and no further action would be taken [18]. Second, when the perceived threat was high, individuals would engage in two mental processes: danger control and fear control. Particularly, when both the perceived threat and efficacy were high, individuals were more likely to activate the danger control process, which led them to adaptive responses (accept the recommended response). In this process, individuals were motivated to control the danger because they were motivated to enact protection behaviors, and their attitudes and behavioral intentions changed in accordance with the message recommendations in order to prevent the negative outcomes induced by the threat [18,19]. When the perceived threat was high and the perceived efficacy is low, individuals were more likely to activate the fear control process by engaging in maladaptive responses (message rejection). In this process, individuals were motivated to control their fear elicited by the health threat, and they would deny the recommendations [16,18]. Witte [16,25] developed the model with the attempt to incorporate threat and efficacy information in one message, and to predict how people accepted the recommended behavior as an effect of the two variables. Based on the EPPM literature, when a high threat of the health hazard was presented, individuals' high capability and the recommended response's adequateness to protect them against the negative outcome would lead to the acceptance of the coping response [19].

A causal relationship has been established between a psychological state (i.e., fear) and the persuasive outcomes (attitude and behavior change) in fear appeal studies [26]. The assessment of risks, action readiness, and behavioral intentions are influenced by fear elicited from the message design. An abundance of research testing the EPPM shed light on the danger and fear control processes

as results of the interaction of threat and efficacy. However, very few studies specifically investigated the role of fear in fear appeal studies.

In explicating an extension of the EPPM, So [27] advocated for a more central role of fear and proposed that fear should function as a mediator between threat appraisal and coping appraisal. That is, for effective risk communication, individuals must first experience fear, which, in turn elicits the coping appraisal process. Popova [28] suggested that “fear should be measured explicitly” (p. 469). There is a need in the fear appeal scholarship to examine if fear can be elicited successfully by manipulating threat, and if fear plays a role in the subsequent message acceptance. Therefore, the present study attempts to investigate the mediating role of fear as an effect of threat information. The following hypothesis is proposed:

**Hypothesis 1 (H<sub>1</sub>).** *Fear will mediate the effect of threat level on risk evaluation, with high fear eliciting high risk evaluation about skin cancer.*

### 1.2. Efficacy as an Existing Individual Variable in the EPPM

Based on the premises in the EPPM, messages are most useful when there is certain level of high threat and high level of efficacy. Therefore, this study attempts to examine how the high threat/high efficacy condition interactively affects people intention to take the healthy action suggested in the message. Specifically, when the perceived efficacy was high, individuals would believe that they were able to effectively avert the threat by performing the preventive behavior recommended in the message [28].

Efficacy functioning as a preexisting individual factor has gained increasing scholarly attention [29]. O’Keefe [26] noted that efficacy should be an effect-based variable rather than an intrinsic message variable. In a review of research using the EPPM, Popova [28] also pointed out the importance to consider individuals’ preexisting efficacy and how it interacts with the message. The author advocated measuring the state of the audience so different interventions could be used. So [27] pointed out the importance of segmenting audience types based on the individuals’ efficacy, and suggested that if the message based on the EPPM failed to help individuals form high-efficacy beliefs, “individuals’ default levels of efficacy beliefs may determine the impact of risk information on protection motivation” (p. 81). This proposition indicates that efficacy information should be tested as an individual factor rather than a message factor. Recent empirical research has provided support to this notion. For example, Popova [30] applied the EPPM to a novel smokeless tobacco product setting, and found that when efficacy is high, higher levels of threat were effective in message acceptance. In this study, the threat and efficacy were both measured as existing individual variables. In an anti-smoking campaign experiment study, Chun and colleagues [29] found that the graphic health warnings on cigarette packages had greater effects on individuals’ desires and intentions to quit smoking when their self-efficacy was high. This study modified the EPPM by measuring self-efficacy as an individual factor rather than a message factor. McMahan, Witte and Meyer’s [31] experiment was one of the few early studies that measured participants’ existing efficacy instead of incorporating this variable in the message. The interaction effect of high threat and high efficacy showed that high threat and high reported efficacy led to strongest attitudes toward electromagnetic fields control measures, but the interaction of high threat and high efficacy did not show significant effect on individuals’ intention and behaviors. More empirical research is needed in that regard to test the effect of high threat and high reported efficacy on the intention to conduct the recommended behaviors in a different context. Therefore, the following hypothesis is proposed:

**Hypothesis 2 (H<sub>2</sub>).** *When exposed to high threat messages, high efficacy individuals will report more intentions to conduct preventive behavior than their low efficacy counterparts.*

### 1.3. Presenting Fear in a Narrative Format

Green [32] conceptualized narratives as stories consisting of a sequence of related events that have a beginning, middle, and end. These aspects were also elements that make narratives different from other types of rhetorical modes (argumentation, description, and exposition). According to Green [32,33], (1) events, (2) characters, and (3) the correlation that connected the events were the key features that constituted a narrative, and the combination of these elements turned out concrete and vivid. Narratives also function through their engaging and involving characteristics.

Narratives have been considered an effective tool for health message design, and stories told by individuals were frequently used in health prevention practices. Many persuasion studies have found that narratives were superior to statistical information [34–37]. For example, Feeley, Marshall, and Reinhart [38] found that participants who were exposed to the narrative message evaluated the tested issue (i.e., organ donation) more positively than those who were exposed to the fact-based message. Surprisingly, narrative messages were also rated as more credible than fact-based messages. Gray [36] argued that narratives were more persuasive than abstract presentations in health education and clinical practice as it demonstrated patients' experiences through their stories. These vivid examples of health practices and illness experiences were able to foster retention and reflection [36]. Chang's [35] research findings demonstrated that narrative advertising information could generate more favorable cognitive responses and positive feelings than statistical information.

The power of narratives, as some scholars argued, lay in the fact that narratives were capable of mentally engaging and absorbing individuals [18]. When individuals were psychologically transported into the narrative world, they were more likely to show attitude and behavior change [33]. Green and Brock [39] suggested that narratives might lead to adoption of story-consistent attitudes. Along this line of research, studies have linked exposure to narratives of cancer to positive attitudes toward protective health behaviors [14]. Humans are "biased" when processing a narrative because it was a format that was relatively easy to process and understand [40]. The use of narrative message in public health interventions has been shown to lead to health behavior change. For example, in a study that investigated the effectiveness of narratives and argument information in enhancing mental illness literacy, Chang [34] found narrative messages had superior effects in terms of increasing intention to seek professional help, and increasing efficacy to identify friends or family who suffered from mental illness. Narrative was a message form that was considered more vivid than argument form [34]. It is the mediating state that gives narratives the persuasive power in changing individuals' behavioral intention and behaviors. Slater and Rouner [41] argued that the mechanisms (e.g., transportation) were crucial to understand how narratives affect behavior change.

Zillmann [17] noted that it was the information that the exemplar (narrative) conveyed as well as the emotional reactivity the information elicits that could enhance accessibility of exemplars and influence judgment. More recently, Jain et al. [42] also argued that testimonial message format was usually considered more attention-grabbing and more engaging than statistical format. In health education practice, campaign messages are often presented in a story format to engage the audience. According to the literature, when high threat information is imbedded in a story format, it will be more vivid and engaging. Therefore, we are in a position to explicate the interactive effect of threat information and message format (narrative vs. non-narrative).

**Hypothesis 3 (H<sub>3</sub>).** *Threat and message format will interactively affect participants' intention to perform the recommended behavior. Specifically, participants in the high threat/narrative condition would be more likely to perform the recommended behavior than those in the other conditions.*

## 2. Method

This study employed a 2 (threat: high vs. low) × 2 (message format: narrative vs. non-narrative) factorial between-subject design.

## 2.1. Participants

A total of 251 participants from a large southeastern U.S. university were recruited to participate in the experiment. Their age ranged from 19 to 26 ( $M = 19.74$ ,  $SD = 1.27$ ,  $Mdn = 19$ ). There were more female students registered in those classes than male students. Males consisted 33.9% of the sample, and females consisted 66.1%. The majority of participants were Caucasian/White ( $n = 203$ , 80.9%), followed by African American ( $n = 40$ , 15.9%), and Latino/Hispanic ( $n = 2$ , 0.80%). Participants received extra credit as a result of participating in the study.

## 2.2. Stimuli

Two types of message formats, narrative and non-narrative, were manipulated. The narrative condition was written as a story. It involved at least one character and a plot. The goal of the narrative format was to create a story based on personal experiences. The non-narrative condition was written with basic information, statistics, and facts. There were no characters or plots. However, the basic information in the two message formats matched with each other.

The threat information design followed Witte's [16] suggestions for developing fear appeal manipulations in the EPPM, which suggested that two components should be included in the threat information: high perceived severity and high perceived susceptibility. Thus, high threat skin cancer messages included the following variables: (1) the high severity of contracting skin cancer; (2) college students' high susceptibility to skin cancer at some point of their lives. In the low threat condition, the high perceived severity and high perceived susceptibility information was absent.

## 2.3. Dependent Measures

### 2.3.1. Fear Perception

Five 7-point (1 = strongly disagree, 7 = strongly agree) Likert scale questions were asked to assess the overall fear appeal, including "This message makes me feel frightened, tense, anxious, uncomfortable, and nervous". Cronbach's  $\alpha$  for this scale was high (0.93). The items were adopted from previous studies [11,43].

### 2.3.2. Perceived Efficacy

The perceived efficacy was assessed using eight, 7-point scales (1 = strongly disagree, 7 = strongly agree). The items used to measure perceived self-efficacy were "Preventing skin cancer is easy to do"; "My health depends on how well I take care of myself"; "My health is within my control"; and "I am able to do something to prevent skin cancer". Cronbach's  $\alpha$  for this scale was 0.88. The perceived response efficacy was assessed via four 7-point scales (1 = strongly disagree, 7 = strongly agree). Examples were "Regular self-examination of skin cancer is the most effective method of detecting it early"; "Avoiding tanning beds is a good way to protect my skin", and "Using sunscreen will prevent my skin from being damaged". Cronbach's  $\alpha$  for this scale was 0.83.

### 2.3.3. Risk Estimation

Health risk estimation was a commonly examined dependent variable in health communication and had been considered a reliable predictor of pro-health behavior [44,45]. Following the questionnaire used by Apanovitch, McCarthy, and Salovey [46], Janssen et al. [44], and Robinson [47], health risk estimation was measured using four 7-point scales (1 = strongly disagree, 7 = strongly agree). The items were "If I got skin cancer, it would have little effect on my life"; "If I got skin cancer, I would be afraid of dying of it"; "If I got skin cancer, I would worry about my future"; and "If I got skin cancer, I would find it very stressful." Cronbach's  $\alpha$  for this scale was 0.82.



### 2.3.4. Intention to Perform the Recommended Behavior

Six 7-point scales ranging from 1 (extremely unlikely) to 7 (highly likely) were used to measure participants' likelihood to accept the suggested behavior. Examples were "In the future, how likely is it that you will wear sunscreen while you are in the sun?"; "How likely is it that you will go to clinic to check your skin?"; "How likely is it that you will seek more information on skin cancer?". Cronbach's  $\alpha$  for this scale was 0.86.

### 2.4. Procedures

The data were collected via computer in a communication research lab in a large southeastern university. Participants were asked to complete a form of consent when they entered the lab. After consent was given, they were randomly assigned to one of the message conditions. Demographic information and efficacy measures were taken first. Participants were then instructed that they would view one health message. After viewing the message, participants completed the dependent measures and the manipulation check questionnaire. After completing the experimental procedure, participants were thanked and debriefed. The entire study lasted approximately 30 to 40 min. There were 62 participants in the high-threat narrative condition, 61 participants in the low-threat narrative condition, 63 participants in the high-threat non-narrative condition, and 65 participants in the low-threat non-narrative condition.

## 3. Data Analysis

Data analyses were performed using SPSS. Hayes' [48] model for mediation was used to test mediation effects of fear. ANOVA was used to test main effects and interaction effects of independent variables on dependent variables.

## 4. Results

### 4.1. Manipulation Checks

Participants were asked to read the assigned messages and then complete a questionnaire that aimed at checking the manipulation of threat information (i.e., severity and susceptibility). The measures for the manipulation check were adapted from a number of prior studies [14,25]. The perceived severity was measured using five items on a 7-point scale (1 = strongly disagree, 7 = strongly agree). Examples were: "This message leads me to think skin cancer is a very serious health problem"; "This message leads me to think skin cancer is very painful"; "This message leads me to think many people die of skin cancer". Cronbach's  $\alpha$  for this scale was 0.82. The perceived susceptibility was assessed with the following questions (1 = extremely impossible, 7 = highly possible): "This message leads me to think my chance of getting skin cancer can be very high" and "This message makes me worried about developing skin cancer because of too much sun exposure". Cronbach's  $\alpha$  for this scale was 0.90.

The manipulation check data were then submitted to a two-way analysis of variance (ANOVA). The severity information was successfully manipulated,  $F(1, 250) = 32.32$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.12$ . Specifically, participants who read the high severity messages reported greater sense of severity ( $M = 5.42$ ,  $SD = 0.09$ ) than participants who read the low severity message ( $M = 4.70$ ,  $SD = 0.09$ ). The manipulation of susceptibility was also successful,  $F(1, 250) = 7.89$ ,  $p < 0.05$ ,  $\eta_p^2 = 0.03$ . Specifically, participants who read the messages with high susceptibility information reported they were more vulnerable to skin cancer ( $M = 5.10$ ,  $SD = 0.12$ ), as compared to those who read the messages with low susceptibility information ( $M = 4.64$ ,  $SD = 0.12$ ).

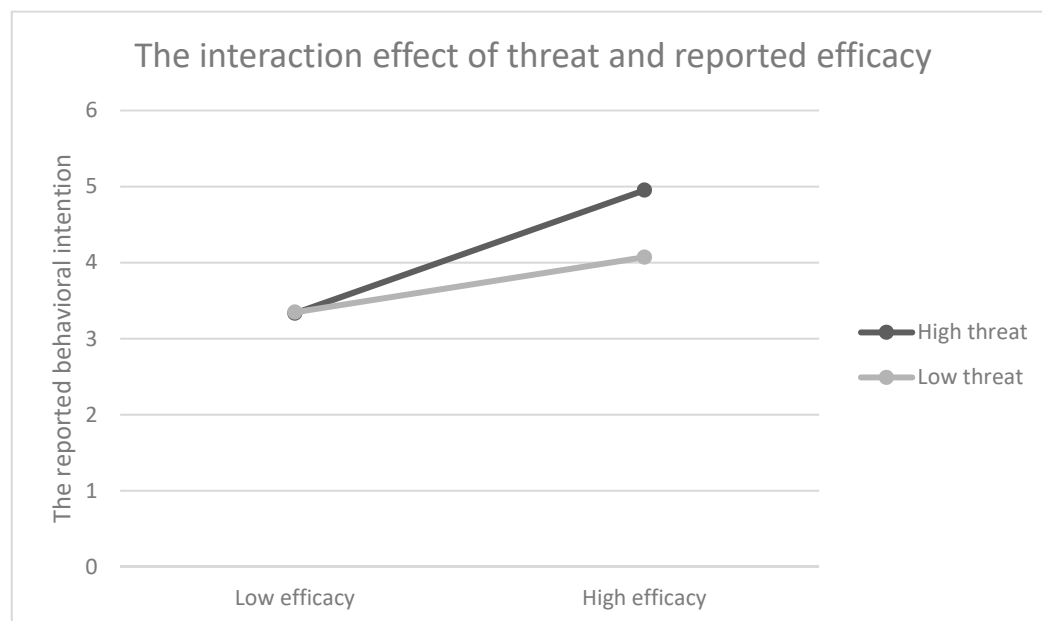
### 4.2. The Mediating Role of Fear on Health Risk Estimation ( $H_1$ )

$H_1$  predicted that fear would mediate the effect of threat on risk estimation. To test this hypothesis, a series of tests were performed using Hayes' [48] model for mediation. In step 1 of the mediation

model, the regression of threat on risk estimation was significant,  $b = -0.42$ ,  $t(249) = -2.49$ ,  $p < 0.05$ . In step 2, the regression of threat on the mediator, fear, was also significant,  $b = -0.67$ ,  $t(249) = -3.63$ ,  $p < 0.001$ . Step 3 showed that fear significantly predicted risk estimation,  $b = 0.20$ ,  $t(248) = 3.62$ ,  $p < 0.001$ . The last step revealed that, controlling for the fear, threat was not a significant predictor of risk estimation,  $b = -0.28$ ,  $t(248) = -1.68$ ,  $p = 0.09$ . Therefore,  $H_2$  was supported, indicating fear mediated the relationship between threat and health risk estimation.

#### 4.3. The Interaction Effect of Threat and Reported Efficacy on Behavioral Intention ( $H_2$ )

$H_2$  predicted that when exposed to high threat messages, individuals who reported high efficacy would show more intention to conduct preventive behavior than their low efficacy counterparts. To test this hypothesis, the researcher first created a new variable “efficacy”, which was the mean of the sum of the self-efficacy and response efficacy scores. Then the researcher used median split approach to divide participants into high and low efficacy individuals. The data were submitted to a two-way ANOVA. The interaction of threat level and efficacy was significant,  $F(1, 250) = 4.28$ ,  $p < 0.05$ ,  $\eta_p^2 = 7.30$ . Specifically, high efficacy individuals were more likely to perform preventive behavior ( $M = 4.71$ ,  $SD = 1.37$ ) than low efficacy individuals ( $M = 3.30$ ,  $SD = 1.20$ ) when they were exposed to high threat messages. Therefore,  $H_2$  was supported (See Figure 1).



**Figure 1.** Interaction of Threat and Reported Efficacy.

#### 4.4. The Interaction Effect of Message Format and Threat on Behavioral Intention ( $H_3$ )

$H_3$  proposed that there would an interaction effect of message format and threat on individuals' intention to perform the recommended behavior. The interaction effect of threat and message format on behavioral intention was not significant,  $F(1, 250) = 0.28$ ,  $p = 0.60$ ,  $\eta_p^2 = 0.001$  (See Figure 2).

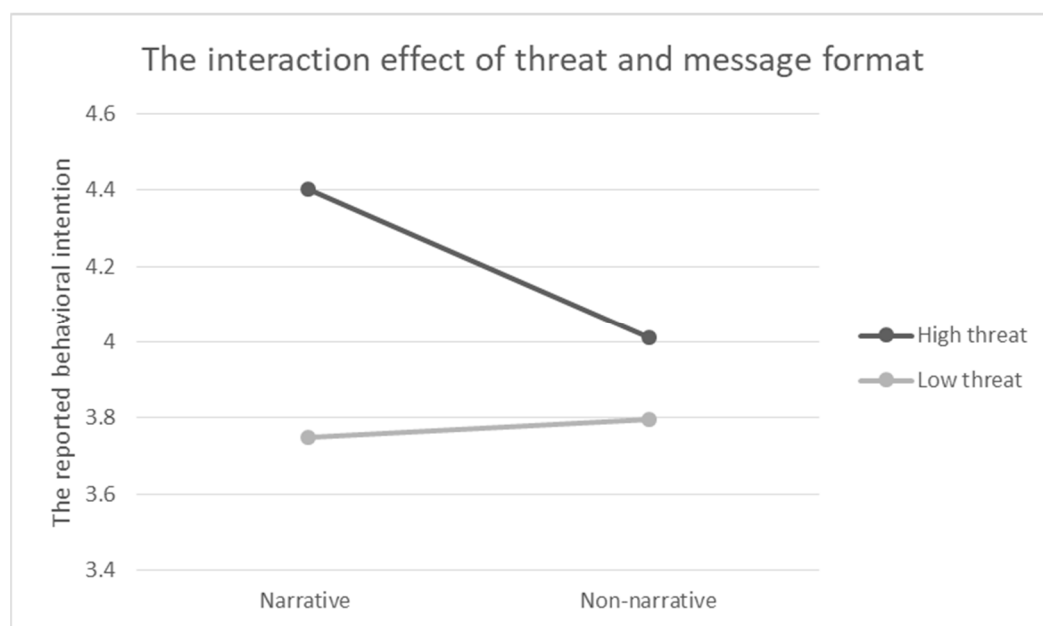


Figure 2. Interaction of Threat and Message Format.

## 5. Discussion

This study investigates the effects of fear appeals on individuals' health risk estimation and coping response in the context of promoting preventive skin cancer behaviors among college students. The findings contribute to the development of EPPM in three folds. First, it highlights the mediating role of fear on individuals' risk estimation of skin cancer. Second, it confirms the role of efficacy as an individual variable instead of a message trait variable. Results show that when reading a high-threat message, participants with high reported efficacy believed that the recommendation outlined in the messages produced the desired outcome and the threat could be averted. Furthermore, the finding suggests that narrative is not an important factor to consider when designing health campaign messages using the EPPM.

One of the contributions of the EPPM was that the model made a distinction between fear, a negatively valenced emotion, and threat, a stimulus variable. Prior fear appeal models such as the Protection Motivation Theory [49] did not test the mediating role of fear. For example, the Protection Motivation Theory proposed that behavioral intention was an interaction effect of threat and efficacy. In responding to high threat messages, high efficacy individuals would show intentions toward the adaptive behavior, while low efficacy individuals would show intentions toward the maladaptive behavior. Even in several prior studies employing the EPPM as a theoretical framework, the mediating role of fear was ignored [50].

The current study contributes to the fear appeal scholarship as it treats threat and fear as two distinct constructs, thus bringing the mediating role of fear on individuals' risk estimation to the forefront of fear appeal research. As Popova [30] argued, "threat is a cognitive assessment, while fear is an emotional response evoked by some stimulus" (p. 932). The finding of the current study is generally in line with Popova's [30] result while some differences exist. For instance, although Popova's [30] study found support for the EPPM proposition that fear lead to fear control responses, it did not test (1) the specific role of fear in the fear appeal messages, and (2) when people report more fear, how they evaluate the risk. Regarding risk estimation, this study found that fear mediated the effects of threat on health risk estimation toward skin cancer, with individuals who reported more fear showing stronger risk estimation than their low fear counterparts. The results indicated that compared with their low counterparts, individuals who were more "scared" by the threatening messages perceive higher risk of developing skin cancer than their low counterparts. Thus, the linkages of threat, fear, and risk



estimation were tested and supported. This finding enriched our understanding of the mechanism of fear appeals whereby fear influenced threatening information in a health communication context. Specifically, when the severity and the susceptibility were high, regardless of the degrees of efficacy, the fear perception was likely to be elicited. This finding confirmed the positive relationship between threat and fear. It should be noted that manifestation of fear is psychosomatic in nature and varies with individuals.

Responding to the calls of previous fear appeal research [27,28], this study measured efficacy as an individual factor rather than a stimulus factor. The current study is in line with Popova's [30] findings in that efficacy should be treated as characters of the individuals instead of message characteristics. EPPM suggested that not only threat information but also self-efficacy and response efficacy played an important role in the development of protective behavior. According to this proposition of EPPM, the threat and perceived efficacy together determined whether an individual responded with an adaptive or a maladaptive coping response. In the present context, adaptive coping response was reflected by showing the intention to perform activities to protect one's skin, while maladaptive behavior was the contrary. The results from this study were consistent with prior findings and the prediction of EPPM. The result implies that when individuals recognize the threat of skin cancer, those with low efficacy will be less likely to show intentions toward the adaptive behavior than their high efficacy counterparts because they feel unable to properly protect themselves from the threat. On the contrary, although they are threatened by a health risk, individuals who feel powerful to properly protect themselves from the health threat may form strong intention toward the adaptive behavior. If individuals are not threatened by the health risk, they will not demonstrate strong intention to perform the prevented behavior, and the difference between high- and low-efficacy individuals is not significant.

Previous research has showed support to the notion that individual characteristics should be factored into the examination of fear appeal effects. For example, McKay et al. [18] reported that audiences' characteristics such as age and education levels play important roles in the fear appeal messages. Specifically, they found that in the high efficacy message condition, older participants (age  $\geq 70$ ) reported lower severity, susceptibility, and fear than younger counterparts ( $50 \leq \text{age} \leq 69$ ). Furthermore, more educated participants reported higher threat perception than those with high school education or less. Such empirical data, along with others, confirmed the notion that audience segmentation is the key when using fear appeals in health messages, so that optimal effects can be reached.

Popova [30] recommended examining message features such as personal testimony, and their effects on the success or failure of fear appeal messages. The current study provides preliminary answer to this call: message format does not affect the intention to perform the recommended behavior. Contrary to the prediction, there are no main effects of narrative format nor interaction effects of narrative and threat on individuals' behavioral intentions. There have been mixed findings regarding the effect of narratives (versus statistics) on various variables. For example, Morman [14] noted that narrative and statistical evidences had equal effects in promoting favorable attitudes and motivating intentions concerning the testicular self-exams. Jain et al. [42] also found no superior effects of testimonial message format on attitude accessibility regarding safe sex. Instead, the study found that statistical format has more power to influence attitude accessibility. Although the current study and Jain et al.'s [42] test fear appeals in different health contexts, the similar insignificant results regarding a story format deserves further attention and explanation.

Jain et al. [42] argue that participants' existing values may play a role in the effect of message format on attitude accessibility, which means, for those participants whose values are consistent with the message, they are likely to show negative attitudes toward the unhealthy behavior. In a similar vein, participants' individual characteristics may be considered to explain the insignificant results of the current research. An individual's cognitive processing preferences such as need for cognition and levels involvement in the stories may offer possible explanations. For example, for individuals with

high need for cognition, they may process fact-based information more effectively than narratives. For people who are easily absorbed into stories, narratives may be more effective.

The findings have practical implications for health educators, clinicians, health policy makers, and health communicators. Emphasizing the health threat in a message might not positively affect individuals with low efficacy. For such individuals, exaggerating the severe consequence of a health risk might lead to fear control process thus avoiding the adaptive behavior recommended in the message. Therefore, it is critical for health practitioners to include high efficacy information in the message in order to boost an individual's level of efficacy. The finding of this study suggests that message format is not an important factor to consider when designing health campaign messages using the EPPM. However, it is possible that a story format would be more persuasive in communicating about skin cancer when the target audience are mainly females, who are more likely to engage in tanning activities.

## 6. Limitation and Future Research

This study has several limitations. This study did not find support for the notion that a narrative format is more superior in motivating individuals to take the health behaviors. Future studies should continue exploring other fear appeal message presentation formats such as visual-oriented fear versus verbal-oriented fear. Also, the role of cognitive factors such as immersion and engagement should be considered and tested. Lewis et al. [51] noted that emotions (e.g., annoyance) other than fear can be a result of threat information and may play a role in individuals' message acceptance or rejection. Such negative emotions will influence individuals' processing of the messages. Future studies should further test the direct or indirect effects of additional emotions to advance the EPPM scholarship. In addition, more females participated in the study than males. Some preexisting conditions and mental states can play a crucial role in fear responses, but they were not tested in the current study. Future studies are encouraged to test possible confounding variables.

**Funding:** This research was funded by the University of Alabama.

**Acknowledgments:** The author would like to thank Shuhua Zhou, Kim Bissell, Joseph Phelps, and James Leeper for their contributions and comments on an earlier draft of the paper.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

- Centers for Disease Control and Prevention. Skin Cancer. Available online: [http://www.cdc.gov/cancer/skin/basic\\_info/](http://www.cdc.gov/cancer/skin/basic_info/) (accessed on 10 December 2019).
- Riet, J.V.T.; Ruiter, R.A.; Werrij, M.Q.; De Vries, H. Self-efficacy moderates message-framing effects: The case of skin-cancer detection. *Psychol. Health* **2010**, *25*, 339–349. [CrossRef] [PubMed]
- American College Health Association. Fall 2011 Reference Group Executive Summary. Available online: [https://www.acha.org/documents/ncha/ACHA-NCHA-II\\_ReferenceGroup\\_ExecutiveSummary\\_Fall2011.pdf](https://www.acha.org/documents/ncha/ACHA-NCHA-II_ReferenceGroup_ExecutiveSummary_Fall2011.pdf) (accessed on 10 December 2019).
- McMath, B.F.; Prentice-Dunn, S. Protection Motivation Theory and Skin Cancer Risk: The Role of Individual Differences in Responses to Persuasive Appeals. *J. Appl. Soc. Psychol.* **2005**, *35*, 621–643. [CrossRef]
- Prentice-Dunn, S.; McMath, B.F.; Cramer, R.J. Protection Motivation Theory and Stages of Change in Sun Protective Behavior. *J. Health Psychol.* **2009**, *14*, 297–305. [CrossRef]
- National Cancer Institute. Skin Cancer. Available online: <http://www.cancer.gov/cancertopics/types/skin> (accessed on 10 December 2019).
- Dillard, J.P.; Nabi, R.L. The Persuasive Influence of Emotion in Cancer Prevention and Detection Messages. *J. Commun.* **2006**, *56*, S123–S139. [CrossRef]
- Dillard, J.P.; Anderson, J.W. The role of fear in persuasion. *Psychol. Mark.* **2004**, *21*, 909–926. [CrossRef]
- Jones, S.C.; Owen, N. Using fear appeals to promote cancer screening—Are we scaring the wrong people? *Int. J. Nonprofit Volunt. Sect. Mark.* **2006**, *11*, 93–103. [CrossRef]

10. Murray-Johnson, L.; Witte, K. Looking toward the future: Health message design strategies. In *Handbook of Health Communication*; Thompson, T.L., Dorsey, A.M., Miller, K.I., Parrott, R., Eds.; Lawrence Erlbaum Associates: Mahwah, NJ, USA, 2003.
11. Dillard, J.P.; Plotnick, C.A.; Godbold, L.C.; Freimuth, V.S.; Edgar, T. The multiple affective outcomes of AIDS PSAs: Fear appeals do more than scare people. *Commun. Res.* **1996**, *23*, 44–72. [[CrossRef](#)]
12. Green, E.C.; Witte, K. Can fear arousal in public health campaigns contribute to the decline of HIV prevalence? *J. Health Commun.* **2006**, *11*, 245–259. [[CrossRef](#)]
13. de Hoog, N.; Stroebe, W.; De Wit, J.B.F. The Impact of Fear Appeals on Processing and Acceptance of Action Recommendations. *Pers. Soc. Psychol. Bull.* **2005**, *31*, 24–33. [[CrossRef](#)]
14. Morman, M. The influence of fear appeals, message design, and masculinity on men's motivation to perform the testicular self-exam. *J. Appl. Commun. Res.* **2000**, *28*, 91–116. [[CrossRef](#)]
15. Roskos-Ewoldsen, D.; Yu, H.J.; Rhodes, N. Fear appeal messages effect accessibility of attitudes toward the threat and adaptive behaviors. *Commun. Monogr.* **2004**, *71*, 49–69. [[CrossRef](#)]
16. Witte, K. Putting the fear back into fear appeals: The extended parallel process model. *Commun. Monogr.* **1992**, *59*, 329–349. [[CrossRef](#)]
17. Zillmann, D. Exemplification Effects in the Promotion of Safety and Health. *J. Commun.* **2006**, *56*, S221–S237. [[CrossRef](#)]
18. McKay, D.L.; Berkowitz, J.M.; Blumberg, J.B.; Goldberg, J.P. Communicating cardiovascular disease risk due to elevated homocysteine levels: Using the EPPM to develop print materials. *Health Educ. Behav.* **2004**, *31*, 355–371. [[CrossRef](#)] [[PubMed](#)]
19. Kotowski, M.R.; Johnstone, P.M.; Smith, S.W.; Pritt, E. Using the Extended Parallel Process Model to create and evaluate the effectiveness of brochures to reduce the risk for noise-induced hearing loss in college students. *Noise Health* **2011**, *13*, 261–271. [[CrossRef](#)]
20. Pengchit, W.; Walters, S.T.; Simmons, R.G.; Kohlmann, W.; Burt, R.W.; Schwartz, M.D.; Kinney, A.Y. Motivation-based intervention to promote colonoscopy screening: An integration of a fear management model and motivational interviewing. *J. Health Psychol.* **2011**, *16*, 1187–1197. [[CrossRef](#)]
21. Cho, H.; Salmon, C.T. Fear appeals for individuals in different stages of change: Intended and unintended effects and implications on public health campaigns. *Health Commun.* **2006**, *20*, 91–99. [[CrossRef](#)]
22. Hong, H. An extension of the Extended Parallel Process Model (EPPM) in television health news: The influence of health consciousness on individual message processing and acceptance. *Health Commun.* **2011**, *26*, 343–353. [[CrossRef](#)]
23. Witte, K.; Allen, M. A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Educ. Behav.* **2000**, *27*, 591–615. [[CrossRef](#)] [[PubMed](#)]
24. Nabi, R.L.; Wirth, W. Exploring the role of emotion in media effects: An introduction to the special issue. *Media Psychol.* **2008**, *11*, 1–6. [[CrossRef](#)]
25. Witte, K. Fear control and danger control: A test of the extended parallel process model (EPPM). *Commun. Monogr.* **1994**, *61*, 113–134. [[CrossRef](#)]
26. O'Keefe, D.J. Message properties, mediating states, and manipulation checks: Claims, evidence, and data analysis in experimental persuasive message effects research. *Commun. Theory* **2003**, *13*, 251–274. [[CrossRef](#)]
27. So, J. A Further extension of the Extended Parallel Process Model (E-EPPM): Implications of cognitive appraisal theory of emotion and dispositional coping style. *Health Commun.* **2013**, *28*, 72–83. [[CrossRef](#)] [[PubMed](#)]
28. Popova, L. The Extended Parallel Process Model: Illuminating the gaps in research. *Health Educ. Behav.* **2012**, *39*, 455–473. [[CrossRef](#)] [[PubMed](#)]
29. Chun, S.; Park, J.W.; Heflick, N.; Lee, S.M.; Kim, D.; Kwon, K. The moderating effects of self-esteem and self-efficacy on responses to graphic health warnings on cigarette packages: A comparison of smokers and nonsmokers. *Health Commun.* **2018**, *33*, 1013–1019. [[CrossRef](#)]
30. Popova, L. Scaring the snus out of smokers: Testing effects of fear, threat, and efficacy on smokers' acceptance of novel smokeless tobacco products. *Health Commun.* **2014**, *29*, 924–936. [[CrossRef](#)]
31. McMahan, S.; Witte, K.; Meyer, J. The perception of risk messages regarding electromagnetic fields: Extending the Extended Parallel Process Model to an unknown risk. *Health Commun.* **1998**, *10*, 247–259. [[CrossRef](#)] [[PubMed](#)]
32. Green, M.C. Research challenges in narrative persuasion. *Inf. Design J.* **2008**, *16*, 47–52. [[CrossRef](#)]

33. Green, M.C. Narratives and cancer communication. *J. Commun.* **2006**, *56*, s163–s183. [[CrossRef](#)]
34. Chang, C. Increasing mental health literacy via narrative advertising. *J. Health Commun.* **2008**, *13*, 37–55. [[CrossRef](#)]
35. Chang, C. “Being hooked” by editorial content: The implications for processing narrative advertising. *J. Advert.* **2009**, *38*, 21–33. [[CrossRef](#)]
36. Gray, J.B. The power of storytelling: Using narrative in the healthcare context. *J. Commun. Health.* **2009**, *2*, 258–273. [[CrossRef](#)]
37. McQueen, A.; Kreuter, M.W.; Kalesan, B.; Alcaraz, K.I. Understanding narrative effects: The impact of breast cancer survivor stories on message processing, attitudes, and beliefs among African American women. *Health Psychol.* **2011**, *30*, 674–682. [[CrossRef](#)]
38. Feeley, T.H.; Marshall, H.M.; Reinhart, A.M. Reactions to narrative and statistical written messages promoting organ donation. *Commun. Rep.* **2006**, *19*, 89–100. [[CrossRef](#)]
39. Green, M.C.; Brock, T.C. The role of transportation in the persuasiveness of public narratives. *J. Pers. Soc. Psychol.* **2000**, *79*, 701–721. [[CrossRef](#)] [[PubMed](#)]
40. Kreuter, M.W.; Green, M.C.; Cappella, J.N.; Slater, M.D.; Wise, M.E.; Storey, D.; et al. Narrative communication in cancer prevention and control: A framework to guide research and application. *Ann. Behav. Med.* **2007**, *33*, 221–235. [[CrossRef](#)]
41. Slater, M.D.; Rouner, D. Entertainment-education and elaboration likelihood: Understanding the processing of narrative persuasion. *Commun. Theory* **2002**, *12*, 173–191.
42. Jain, P.; Hoffman, E.; Beam, M.; Xu, S. Effect of message format and content on attitude accessibility regarding sexually transmitted infections. *Health Commun.* **2017**, *32*, 1376–1384. [[CrossRef](#)]
43. Dillard, J.P.; Peck, E. Affect and persuasion: Emotional responses to public service announcements. *Commun. Res.* **2000**, *27*, 461–495. [[CrossRef](#)]
44. Janssen, E.; Van Osch, L.; De Vries, H.; Lechner, L. Measuring risk perceptions of skin cancer: Reliability and validity of different operationalizations. *Br. J. Health Psychol.* **2011**, *16*, 92–112. [[CrossRef](#)]
45. Rimal, R.N.; Adkins, A.D. Using computers to narrowcast health messages: The role of audience segmentation, targeting, and tailoring in health promotion. In *Handbook of Health Communication*; Thompson, T.L., Dorsey, A.M., Miller, K.I., Parrott, R., Eds.; Lawrence Erlbaum: Mahwah, NJ, USA, 2003; pp. 497–513.
46. Apanovitch, A.M.; McCarthy, D.; Salovey, P. Using message framing to motivate HIV testing among low-income ethnic minority women. *Health Psychol.* **2003**, *22*, 60–67. [[CrossRef](#)] [[PubMed](#)]
47. Robinson, J. The Impact of Preventive Measure Information and Terrorism-Related Entertainment Media on Risk Perception: Investigating the Role of Affective State, Individual Differences, and Institutional Credibility. Ph.D. Thesis, The University of Alabama, Tuscaloosa, AL, USA.
48. Hayes, A.F. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*; The Guilford Press: New York, NY, USA, 2013.
49. Rogers, R.W. Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In *Social Psychophysiology: A Sourcebook*; Cacioppo, J.T., Petty, R.E., Eds.; Guilford: New York, NY, USA, 1983; pp. 153–176.
50. Allahverdipour, H.; MacIntyre, R.; Hidarnia, A.; Shafii, F.; Kzamnagad, A.; Ghaleiha, A.; Emami, A. Assessing protective factors against drug abuse among high school students: Self-control and the Extended Parallel Process Model. *J. Addict. Nurs.* **2007**, *18*, 65–73. [[CrossRef](#)]
51. Lewis, I.; Watson, B.; White, K.M. Extending the explanatory utility of the EPPM beyond fear-based persuasion. *Health Commun.* **2013**, *28*, 84–98. [[CrossRef](#)] [[PubMed](#)]

