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THE EFFECT OF PERSUASIVE HEALTH MESSAGES ON HEALTH MESSAGE  
PERCEPTIONS

by

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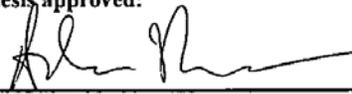
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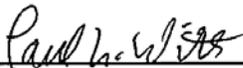


The Effect of Persuasive Health Messages on Health Message Perception

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## The Effect of Persuasive Health Messages on Health Message Perception

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Texas Christian University, 2016

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This study explored the accuracy of the extended parallel processing model proposed by Witte (1992), the predicted outcomes, the way key variables within the EPPM (including threat and efficacy constructs) are currently conceptualized, and whether or not self-enhancement had an effect on the model's predicted outcomes. Participants included 292 young adults who were surveyed through online questionnaires. The questionnaires tested the extended parallel processing model, also known as the EPPM, predictions through three measures: the Behavioral Intention Measure (Fishbein & Azjen, 2010), the Fear Response Scale (Witte, 1992), and the Message Derogation Scale (Witte, 1992). The questionnaires also measured individuals' levels of self-enhancement.

Conducting analysis with self-enhancement only yielded one significant result, indicating there was not support for the proposed hypotheses. Although the hypotheses were not supported, results indicated that when self-enhancement was high and severity was high, self-efficacy had a positive effect on behavioral intention. Further analysis conducted without self-enhancement, and although the further analysis did not support the proposed hypotheses, the analysis indicated some of the EPPM predications were accurate and provided insight as to the drivers of these outcomes. In the original EPPM, threat is composed of severity and susceptibility; if either variable is perceived to be high, the overall message is seen as threatening, and therefore prompts the individual to respond accordingly (Witte, 1992). In this experiment, however, fear

control was only effected by the level of severity. Additionally, the EPPM predicts that individuals with low perceived efficacy are more likely to respond with message rejection (Witte, 1992). This was supported by the experimental findings which showed that individuals who perceived high levels of self-efficacy were less likely to respond with message rejection.

Some of the data analysis from this experiment indicated predictions that did not follow the EPPM. More specifically, in the experiment, when response efficacy was low, individuals were more likely to respond with intended behavior change, which is not predicted by the EPPM. Furthermore, when the susceptibility condition was low, a condition that actually elicited greater perceived susceptibility, individuals reported lower intended behavior change. These findings contradict what the EPPM predicts (Witte, 1992).

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### The Effect of Persuasive Health Messages on Health Message Perception

Using threat messages to persuade individuals is not a new phenomenon. From smoking warnings to anti-drug campaigns, individuals are exposed to threat-based persuasive messages every day. To better understand the effect threat messages have on individuals' responses, Witte (1992) proposed the extended parallel process model. Though the model allows for partial understanding of threat-based persuasive messages, it does not fully explain the processes and outcomes involved due to its confounding treatments of key variables, namely threat and efficacy. By delineating the larger threat construct into the concepts of susceptibility and severity and the larger efficacy construct into the concepts of self-efficacy and response efficacy, and by considering how self-enhancement affects the process of risk perception, the following study aimed to advance the understanding of threat based persuasive messages.

#### **Theoretical Perspective: Factors That Influence Threat-Based Persuasion Messages**

##### **The Extended Parallel Process Model (EPPM)**

The extended parallel process model (EPPM) explains how individuals react to messages that invoke fear. Witte (1992) characterized fear as “a negatively-valenced emotion accompanied by a high level of arousal, which is elicited by a threat that is perceived to be significant and personally relevant” (p. 331). There is a clear distinction between fear and threat, though in most scholarship the words are used as if they are interchangeable. The difference between the two terms relies on the origin of the term. Fear is an internal characteristic that is experienced through negative emotion. Threat, on the other hand, is an environmental characteristic that evokes negative consequences (Mongeau, 2012). Fear and threat intersect in fear appeals because of the threat component and the coping component that must be present.

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, 1994a). Rogers (1975) was one of the first scholars to suggest that an individual's perception of threat is influenced by two factors: susceptibility and severity. Susceptibility refers to the individual's perception of the risk of contracting the health condition (Gore & Bracken, 2005). Severity refers to the individual's perception of the seriousness of the threat (Rogers, 1975). Individuals' perceived efficacy also influences how the individual responds to fear appeals. Self-efficacy represents the extent to which individuals feel they have the ability to perform the recommended behaviors (Rogers, 1983). Response efficacy refers to the availability and effectiveness of a coping response "that might reduce or eliminate the noxious stimulus" (Rogers, 1975, p. 97). In concept, it is clear that each variable is an independent, distinct entity, but in empirical tests of the theory, the distinctions between the two efficacies and two threat constructs are often lost or the items are used interchangeably.

The EPPM predicts that individuals who experience messages high in threat and high in efficacy will respond with danger control (Witte, 1992). Danger control, which is also referred to as behavior change in some literature, involves adaptive behavior designed to minimize the impact of the threat and is a highly cognitive process. If an individual perceives a message high in threat and low efficacy, the EPPM predicts the individual will react with fear control or a fear response. This means that individuals will avoid situations in which they think the threat is present, which is a highly emotional process. If an individual experiences a message that is either low in both threat and efficacy or low in threat and high in efficacy, the EPPM predicts no response, or message rejection, because there is little to no motivation to continue message processing.

Though the EPPM has been used in health communications for many years, studies of the EPPM have yielded mixed results. Supporting the EPPM predicted results, Vírveda et al. (2010) found that hospital workers were less likely to accept vaccinations for H1N1 and seasonal influenza when their concern about becoming infected with either disease was low (i.e., low perceived susceptibility) and they had doubts about the effectiveness of the vaccine (i.e., low response efficacy). The EPPM has also been used successfully in designing public health emergency-preparedness interventions (Barnett et al., 2014). Witte and Allen (2000), however, conducted a meta-analysis which compared the four EPPM conditions. The meta-analysis generated inconsistent results with those predicted by the model. Both low threat-high efficacy and high threat-low efficacy conditions generated greater attitude change than low threat-low efficacy conditions. The EPPM predicts all three conditions should generate identical attitude change. Furthermore, Nabi, Roskos-Ewoldsen, and Carpentier (2008) concluded that a critical factor in the EPPM is how new the threat component is to the audience. When a threat is well known to participants, Nabi et al. suggest that the efficacy information can be more persuasive and produce less reactance than presenting the full appeal. Viewed altogether, these inconclusive and contradictory results suggest that the way threat and efficacy are currently studied produce confounding results. By further deconstructing each variable, scholars can better understand the effect the components of threat and efficacy have on overall threat and efficacy evaluations, thus gaining further insight into the processing of fear messages.

### **Threat Evaluation**

Understanding threat evaluation is critical in understanding the EPPM. Researchers have studied the EPPM and threat messages from the perspective that a threat is evaluated in two parts: how susceptible someone is to the threat (susceptibility), and how severe the impact of the

threat is (severity). When evaluating threat messages, as previously stated, scientists have often based their evaluations on the level of susceptibility or the level of severity, but very rarely do they simultaneously evaluate the two concepts as separate constructs. Recent studies have begun to parse out the differences between severity and susceptibility, focusing on how each contributes to evaluating threat. Studying the third-person effect, Shah, Farber, and Youn (1999) posited that judgments of susceptibility and severity were two separate components of threat that required separate appraisal processes. These appraisal processes, when combined, shape an individual's danger control behaviors. Furthermore, according to Sutton (1987), attitude theories and utility models of decision-making reflect what the individuals expect to happen given the action and the perceived benefits that could come from those actions. Given this reliance on expectancies and values, it is imperative to understand how varied levels of susceptibility and severity impact an individual's decision making. Without distinguishing the marked difference between the variables needed to evaluate threat, there is a question as to what variables specifically effect threat evaluations.

El-Toukhy (2015) indicated that “a progressive increase in perceptions of a health risk prevalence rates was associated with an increase in susceptibility and a decrease in severity and vice versa” (p. 499) demonstrating that susceptibility and severity are distinct variables that impact threat evaluation (El-Toukhy, 2015; Ronis, 1992). Without studying susceptibility and severity as independent variables in threat evaluation, it is difficult to conclude if either variable carries greater weight in threat evaluation. By studying the susceptibility and severity constructs as distinct entities, as they are defined in the EPPM, scholars will have a better understand of threat evaluation, and will therefore be able to more accurately predict responses to threat messages. Although El-Toukhy (2015) began the process of parsing the separate effects of

severity and susceptibility, these concepts are not the only ones in the EPPM that require further attention.

### **Efficacy Evaluation**

Efficacy, like threat, also lacks distinction when measured in many EPPM based studies. The two components of efficacy evaluation are self-efficacy and response efficacy. Self-efficacy refers to an individual's belief in his or her capacity to execute the necessary behaviors to produce specific performance attainments (Bandura, 1977, 1986, 1997). Response efficacy is the extent to which an individual believes a recommended response effectively deters or alleviates a health threat (Witte, 1992, 1994b). Because of a lack of focus on the differences between self-efficacy and response efficacy, it is unclear which efficacy type aids in evaluating the persuasive message. Though the measurement of efficacy is unclear in the EPPM, the conceptualization of efficacy is very clear. Conceptually, it is clear the two variables are distinct, but they are treated as if the two are interchangeable in studies, focusing on one or the other, but not both. As with threat evaluation, this lack of distinction limits the understanding of how the two efficacy variables impact an individual's perception of risk during persuasive message evaluation.

### **Measurement of the EPPM**

In order to evaluate fear control responses and likelihood of behavior change, Witte, Cameron, McKeon, and Berkowitz (1996) created the Risk Behavior Diagnosis Scale. The scale was specifically designed to identify the most effective HIV/AIDS prevention messages for a specific audience, but has since been adapted to fit many scenarios. The scale is a 12-item measure which asks participants to indicate their responses on a 1-5 scale, with 1 being *strongly disagree* and 5 being *strongly agree*. The questions vary from self-efficacy measures to response efficacy measures and from severity measures to susceptibility measures. The scale includes

questions such as: “[*Recommended response*] is effective in preventing [*health threat*]” and “I am at risk for getting [*health threat*].” After the scale measure was completed, Witte, Cameron, McKeon, and Berkowitz (1996) indicated that, by subtracting the measures of self-efficacy and response efficacy from the measures from severity and susceptibility, one could determine whether or not the participants responded to the persuasive message with fear control (negative scores) or with intended behavior change (positive scores).

Although the scale serves as manipulation checks for the levels of severity, susceptibility, response efficacy, and self-efficacy, the scale itself does not measure the intended outcomes that Witte claims to measure through the EPPM. Instead, the measure is used to assume that the final tabulated score indicates the presence of outcomes such as message rejection, fear response, and danger control, due to theoretical assumptions; the questions themselves do not actually measure indications of intended responses, such as fear control or behavior control, but rather whether or not the reader can identify the presence of self-efficacy, response efficacy, severity and susceptibility within the message.

Furthermore, the author assumed that because certain levels of threat and efficacy were present, people would respond with fear control and behavior change without actually measuring whether or not the respondents did. As previously mentioned, different studies have indicated the presence of different outcomes throughout fear appeal scholarship. In some research, low susceptibility and low response efficacy did result in message rejection, as the EPPM posits (Virseda et al., 2010), but in another study, low threat-high efficacy and high threat-low efficacy conditions resulted in greater levels of behavior change than low threat-low efficacy (Witte & Allen, 2000). The EPPM predicts the three conditions should elicit the same amount of behavior change (Witte, 1992). Because the outcome measures of the EPPM appear to be based on

theoretical assumptions and not hard scientific evidence from data collection, scholars have since found conflicting results. Without concrete measures that are theoretically sound and empirically supported, the EPPM cannot accurately predict outcomes.

Although measuring intent is difficult to achieve, more concrete measures, such as the ones suggested in this study, should be used in order to determine whether or not fear control or intended behavior change is present after message exposure. Instead of assuming people behave in accordance with the theoretical expectations based on the presence of certain threats and efficacy variables, more appropriate measures can be used. The Behavioral Intention Measure, created by Fishbein and Ajzen (2010), measures the intent to implement behavioral change after message exposure. The measure includes a set of six questions that measure if individuals feel that they can, and will, implement behavior change. This measure is a better measure of behavior change than the current method used in the EPPM because it measures the intended behavior change, rather than assuming behavior change will occur because of the presence of high threat and high efficacy.

The Fear Response Scale (Witte, 1992) would demonstrate an individual's likelihood to respond with fear control, as predicted by the EPPM, by measuring the individual's pre-existing level of fear after exposure to a threat. The Fear Response Scale (Witte, 1992) includes a set of six questions that measure an individual's level of fear after exposure to a message. The higher the numbers, the more fear the individual has, which would increase the likelihood of responding with fear control in order to mitigate fear.

The final outcome of the EPPM, message rejection, can be measured using the Message Derogation measure (Witte, 1992). The Message Derogation scale is comprised of a series of four questions, each focused on whether or not the individual believed that the message was of

little worth. If the respondent has high levels of message derogation, it is a clear indication that the message was rejected by the individual. Because new measures need to be implemented in order to accurately predict outcomes in the EPPM, additional variables need to be considered when viewing potential outcomes of the EPPM, such as how decisions are made and how trait level variables impact the decision making process.

### **Prospect Theory and Emotional Decision Making**

Although prospect theory was originally developed for gain and loss framed persuasive messages (Kahneman, 2011a), it can be applied to persuasive threat messages because a threat possesses a form of loss for those exposed. Prospect theory states that people's psychological makeup prompts them to value the outcomes of decision tasks as either gains or losses comparative to some reference point. The theory also assumes that the available options are evaluated separately and independently and that the option with the highest perceived value is selected (Kahneman, 2011a). It is important to note that this theory does not assume that humans are logical beings and that the value is more often a subjective evaluation, rather than an objective one (Kahneman, 2011a). A study conducted by De Dreu and McCusker (1997) concluded that humans consider gains and losses psychologically, rather than logically, and that humans work harder to avoid loss. This means that a decision maker tends to select an option with the least amount of perceived loss, even if that loss is the less logical option. Though individuals like to believe all decisions are made logically, prospect theory indicates otherwise. Prospect theory can be used as a framework to further understand just how self-enhancement effects an individual's ability to process threatening messages because the theory highlights the emotional processes involved when evaluating threats and perceived efficacy.

### **Self-Enhancement**

Self-enhancement refers to a class of psychological phenomena in which an individual has a subjectively positive view of themselves. (Sedikides & Gregg, 2008). The four manifestations of self-enhancement include: an observed effect, an ongoing process, a personality trait, and an underlying motive. It is important to note that all four exhibitions are attempts to increase an individual's positive evaluation of self.

An individual can self-enhance in many ways, such as self-advancing or self-protecting. Self-advancing is categorized by seeking out more positive information in order to have a larger quantity of positive information. Individuals focus on positive information, but do not seek out additional information during self-protecting in order to diminish the impact of the negative. By not seeking new information, individuals do not open themselves up to the possibility of discovering more negative information (Arkin, 1981).

Unconscious psychological processes are automatically employed "as a means of protecting and advancing self-enhancement" (Sedikides & Gregg, 2008, p. 105). In other words, self-enhancement occurs more as an ongoing process than as an observed effect, which indicates that psychological and social-cognitive factors are involved. This idea is further explored by Sedikides and Strube (1995), who stated that "the emphasis on self-enhancement is based on the assumption that basic concerns about pleasure and pain, broadly defined, have made concerns about self-enhancement more primary to psychological functioning" (p. 1333). This indicates that self-enhancement is used as a tool to cope, which directly pertains to the individual's perceived level of threat, susceptibility and efficacy.

Applying prospect theory to self-enhancement would indicate that those who have high levels of self-enhancement would process persuasive messages differently from those with low self-enhancement because of the threat/loss processes involved and the differing focus of

positive information due to the high self-enhancement. As stated previously, self-enhancement changes the way individuals perceive information through an ongoing psychological process. This ongoing process influences the way individuals process information, which motivates the individual to focus on the positive information. In previous studies, this change in focus for individuals has been demonstrated in individuals who displayed evidence of self-enhancement. Self-enhancement ultimately changed the way risk was evaluated when asked to evaluate information about driving and car crashes. In 2005, a set of studies by Harre, Foster, and O'Neil supported that self-enhancement significantly changed the way individuals evaluated risk. In the first study, 314 participants were asked to rate their likelihood of being involved in a car crash relative to the likelihood of their peers being involved in a car crash. Individuals were also asked to rate crash-risk optimism, their crash history, stereotypes of young drivers, and concern over other health issues. Those who displayed evidence of self-enhancement ranked their peers to have a much higher likelihood of involvement in a car crash than themselves and perceived themselves to be more competent drivers (Harre, Foster, & O'Neil, 2005). In a follow up study, 193 individuals were used as a control group and 173 individuals watched a short film about the dangers of drinking and driving. Both groups then completed the comparison survey from the previous study. In the end, the experimental group showed more self-enhancement when evaluating driving ability than the control group; men also displayed a significantly higher level of self-enhancement than women when discussing driving ability. When viewing both studies, it is clear that self-enhancement effected an individual's ability to process information and that the presence of a threat brought out the need to self-enhance in individuals. Those with higher levels of self-enhancement believed themselves to be better drivers (i.e., focused on the positive

information and presented it as a self-serving bias) than their peers. Subsequently, self-enhancement was activated in the presence of threat in order to protect the individual.

Though younger drivers account for over 30% of car crashes (Ouimet, Pradhan, Brooks-Russell, Ehsani, Berviche, & Simons-Morton, 2015), the presence of self-enhancement curbed some participants' evaluation of risk, allowing them to believe they were less likely to crash than their peers due to the focus on positive information (i.e., the individuals self-report of their own driving skill). This same phenomenon can be used to predict how the presence of self-enhancement will affect how individuals process the perceived level of threat regarding health messages.

In short, high self-enhancement would cause individuals to under-value levels of possible threat when analyzing threatening information. Those with higher levels of self-enhancement would frame threatening messages as less threatening because their focus on positive information sets a unique starting point, or reference, to the processing of information. Like Harre et al.'s (2005) findings, those with higher levels of self-enhancement would under-estimate the level of threat because of the over-estimation of positive self-characteristics. In turn, those with lower levels of self-enhancement would not have the high focus on positive information when processing information, so the perceived level of threat and efficacy of the message would be thought of differently from those with high levels of self-enhancement.

### **Rationale**

The objective of the study was to contribute to the theoretical knowledge base that suggests threat appraisal should be viewed as two separate leveled variables (i.e., level of susceptibility and level of severity) and that efficacy should be viewed in a similar vein by focusing on the separation between self-efficacy and response efficacy. Though the EPPM has

been an accurate predictor for some responses, within those predicted outcomes there is not a precise explanation for what exactly impacts the evaluation of threat and efficacy due to lack of specificity. With more distinctions between the different kinds of efficacy and the variability in assessing threat, such as those employed in this study, scholars will have a better understanding of just how severity and susceptibility impact threat and how self-efficacy and response efficacy impact efficacy. This distinction will help frame further research, but will also help in understanding the possible outcomes in the EPPM, not just some.

Although the EPPM attempts to explain how individuals evaluate risk, tests of the model do not reflect all of the theoretical aspects that are included when evaluating risk. The EPPM predicts that severity and susceptibility build upon one another (i.e. severity + susceptibility = perceived threat) and that either low severity *or* low susceptibility will yield little to no threat to the individual. As El-Toukhy (2015) indicated, however, “risk perceptions can be misleading if only one dimension of risk perceptions [are] considered,” (p. 508) thus both severity and susceptibility need to be considered when evaluating risk. As previously mentioned, El-Toukhy (2015) demonstrated there was an inverse relationship between susceptibility and severity. Individuals thought they were more susceptible when asked about common illnesses, such as the flu, followed by familiar illnesses (such as diabetes). Individuals indicated the least amount of susceptibility when asked about rare conditions like leukemia. Severity, on the other hand, was ranked highest for rare conditions, followed by familiar illnesses. Common illnesses were considered to be the least severe (El-Toukhy, 2015). Moreover, individual differences, such as the level of self-efficacy, did not affect perceived susceptibility and severity, “nor did they change how accessible these perceptions were” (El-Toukhy, 2015, p. 509). These findings

indicate that severity and susceptibility each play a unique role in evaluating risk and that varied levels of the concepts can result in different evaluations of overall threat.

The EPPM, when contrasted with El-Toukhy's (2015) findings, should not indicate that severity and susceptibility hold equal weight in threat evaluation. This idea was further explored in a meta-analysis by Witte and Allen (2000) who indicated that high threat-low efficacy groups were more persuasive than low threat-low efficacy groups. In the same meta-analysis, evidence was found that suggested that severity played a smaller role in threat evaluation than susceptibility, which was later mirrored with self-efficacy and response efficacy; self-efficacy manipulations resulted in a slightly stronger effects on persuasive outcomes than response efficacy, indicating that self-efficacy may play a larger role in efficacy evaluation than previously thought (Witte & Allen, 2000).

These new findings would indicate that when individuals are presented with situations where there is low severity and high susceptibility, the individual could still perceive a level of threat, and conversely, individuals presented with situations with low response efficacy and high self-efficacy would believe there to still be a level of efficacy overall, changing the response predicted by the EPPM. Instead of rejecting the message, individuals who were exposed to messages with low severity, high susceptibility, low or high response efficacy, and high self-efficacy would respond with danger control because individuals would still perceive a level of efficacy overall. The EPPM does initially predict danger control for individuals with high levels of perceived self-efficacy (Witte, 1992), however, Witte and Allen's study (2000) allows for further definition and clarity when understanding what variables need to be present in order for an individual to perceive overall high or low efficacy. Because self-efficacy is weighted more heavily in efficacy evaluations (Witte & Allen, 2000), individuals would respond with message

rejection when presented with messages that have low severity, low susceptibility, low self-efficacy, and either low or high response efficacy. This is because low self-efficacy outweighs response efficacy when evaluating overall efficacy, causing individuals to feel they have no control over the situation. Thus, it is predicted that individuals with low levels of self-enhancement will respond with danger control (also known as behavior change) when presented with a message that has low severity, high susceptibility, high self-efficacy, and either high or low response efficacy and that individuals with low levels of self-enhancement will respond with message rejection when presented with a message that has high severity, low susceptibility, high or low self-efficacy, and high or low response efficacy.

When presented with messages that have low severity and high susceptibility, individuals will still believe there to be an element of threat, thus allowing the individual to continue on to evaluating the level of efficacy involved in the fear message. This would result in individuals rejecting messages with low overall efficacy (low self-efficacy and low response efficacy *or* low self-efficacy and high response efficacy) and individuals responding with danger control to messages with high overall efficacy (high self-efficacy and low response efficacy *or* high self-efficacy and high-response efficacy).

As previously indicated, evaluating risk and efficacy is more complicated than initially predicted by the EPPM in that risk evaluation is not a simple 50/50 between susceptibility and severity. By simultaneously analyzing and controlling for the variables that comprise risk and efficacy, communication scientists will have a clearer understanding of which variables impact risk and efficacy evaluation. As previous research by Witte and Allen (2000) and El-Toukhy (2015) suggested, self-efficacy had a stronger effect on persuasive outcomes than response efficacy, signifying self-efficacy's larger role in efficacy evaluation. Similarly, susceptibility

was found to have more weight when evaluating risk than severity, indicating that individuals rely more on susceptibility evaluations than severity when evaluating overall risk (Witte & Allen, 2000). With these findings, it is clear that the latitudes of responses predicted by the EPPM does not factor in the differences in evaluating risk and efficacy, and therefore does not account for all possible outcomes when individuals are exposed to threat messages. Therefore, it is hypothesized that individuals with low levels of self-enhancement will respond with fear control when presented with a message that has high severity, high susceptibility, and low self-efficacy, regardless of the level of response efficacy and that individuals with low levels of self-enhancement will respond with danger control (i.e. behavior change) when presented with a message that has high severity, high susceptibility, and high self-efficacy, regardless of the level of response efficacy.

Additionally, this research seeks to discover if high levels of self-enhancement change the way persuasive threat messages are processed, thus changing an individual's response to the message. By breaking down threat and efficacy into more precise variables and focusing on an individual's pre-existing level of self-enhancement, this study will help fill in the existing gaps in the EPPM and shed light on how self-enhancement influences the perceptions of threat messages. It is predicted that those with high levels of self-enhancement will not be swayed by highly threatening messages, messages with high susceptibility and high severity, because of the focus on positive information due to self-enhancement. As previously mentioned, Harre et al. (2005) found that self-enhancement activated in the presence of threats and individuals with higher levels of self-enhancement under-estimated the level of threat and over-estimated positive self-characteristics. Harre et al.'s (2005) findings change the EPPM's current outcomes, meaning that those with high levels of self-enhancement would not detect threat within health

messages. Because the individual would be focused on positive information, threat would appear to be nonexistent, and would not be evaluated at all. Therefore, the individual would reject the message outright, regardless of the level of overall efficacy.

Should self-enhancement impact the way individuals perceive threat and susceptibility, it would substantially change how health messages are shaped, but would also prompt scholars to focus on how self-enhancement impacts message processing in various settings, such as gain and loss framed messages and other persuasive tactics. It is for these reasons that the following hypotheses (see Table 1) were advanced for the current study:

Table 1

*Hypotheses and Predictions*

		Response Eff.		Severity								
				Low				High				
				Susceptibility								
				Low		High		Low		High		
Self-Efficacy		Low	High	SE	Low	High	Low	High	Low	High	Low	High
				Low	Message Rejection							
High	Message Rejection	Fear Control	Message Rejection									
High	Low	Message Rejection	Message Rejection	Danger Control	Message Rejection	Danger Control	Message Rejection					
	High	Message Rejection	Message Rejection	Danger Control	Message Rejection	Danger Control	Message Rejection					

H<sub>1</sub>: Individuals with high levels of self-enhancement will respond with message rejection when presented with a message regardless of the level of severity, susceptibility, self-efficacy, or response efficacy.

H<sub>2</sub>: Without self-enhancement, individuals will respond with danger control (also known as behavior change) when presented with a message that has low severity, high susceptibility, high self-efficacy, and either high or low response efficacy.

H<sub>3</sub>: Without self-enhancement, individuals will respond with message rejection when presented with a message that has high severity, low susceptibility, high or low self-efficacy, and high or low response efficacy.

H<sub>4</sub>: Without self-enhancement, individuals will respond with fear control when presented with a message that has high severity, high susceptibility, and low self-efficacy, regardless of the level of response efficacy.

H<sub>5</sub>: Without self-enhancement, individuals will respond with danger control (i.e. behavior change) when presented with a message that has high severity, high susceptibility, and high self-efficacy, regardless of the level of response efficacy.

## **Method**

### **Design**

This experiment is a 2 (severity) x 2 (susceptibility) x 2 (self-efficacy) x 2 (response efficacy) design. Threat has been broken down into two variables, severity and susceptibility, that has two levels (high and low) for more accurate measures of perceived level of threat. Similarly, efficacy has been divided into self-efficacy and response efficacy with high and low levels. Self-enhancement will be used as a measured independent variable.

### **Sample and Participation Selection**

The participants for this experiment were undergraduate students from entry-level communication courses at Texas Christian University ( $N = 292$ ), 99 (33.91%) of whom were male and 193 (66.09%) of whom were female. The group was of largely Caucasian descent (82.88%). The average age for participants was 18.58 ( $SD = 4.83$ ,  $range = 18-27$ ). Participation was completely voluntary and participants were allowed to withdraw from the study at any time. Participants received a small amount of course credit for participating in the study and alternative assignments were provided for those who wished to not take part in the study.

### **Procedure and Measures**

Students who gave their consent to participate were given a set of questions to measure self-enhancement. Once the self-enhancement questions were answered, students were randomly assigned to experimental conditions and asked to read a fictitious article with varying levels of self-efficacy, response efficacy, susceptibility and severity regarding an alleged infection called South American Respiratory Infection (SRS). The fictitious persuasive messages were created so they appeared to be from the Fort Worth Star Telegram, a reputable and local newspapers for the respective sample. After reading the messages, the participants were asked to answer questions that addressed: behavioral intention, fear control, confound checks, perceived manipulation, and message derogation. Following the scale questions, participants were asked to complete a small set of demographic questions. Participants read a debriefing statement informing them of the purpose of the study and that all materials from the study were falsified for research purposes.

**Self-enhancement.** To measure self-enhancement, a modified version of the Over-Claiming Questionnaire (OCQ) was used. Paulhus, Harms, Bruce and Lysy (2003) established the measure was an accurate measure of self-enhancement in a set of studies ( $M = 4.24$ ,  $SD =$

0.90,  $\alpha = .95$ ). The OCQ asks participants to rank their familiarity with a large list of items, some of which are non-existent. The list of items included things like “rank your familiarity with the following: Napoleon, Richard Sherman, *Of Mice and Men*,” and “The Good Doctor Fehr.” The scale is a 0-6 scale with 0 being *never heard of it* and 6 being *very familiar*. High self-enhancers reportedly inflate their scores for both real items and falsified items, marking that they are familiar with the falsified items. After calculating the results, individuals are placed in categories such as high self-enhancers, moderate self-enhancers, and low self-enhancers.

**Behavioral intention.** The Behavioral Intention Measure was created by Fishbein and Ajzen (2010). These questions measure behavioral intention, or the intent to implement behavioral change ( $M = 2.27$ ,  $SD = 1.05$ ,  $\alpha = .73$ ). The measure includes a set of six questions that measure if individuals feels they can, and will, implement behavior change. The measures are on a 1-7 scale with varied responses. The measure includes response items such as *extremely easy to extremely difficult*, *strongly agree to strongly disagree*, *definitely true to definitely false*, *impossible to possible*, and *I definitely will to I definitely will not*, in order to gauge a respondent’s willingness to engage in behavioral change. This measure was used in place of the previously mentioned Risk Behavior Diagnosis Scale (Witte, Cameron, McKeon, & Berkowitz, 1996) for a more accurate measure of intended behavior change.

**Fear control.** In order to measure an intended fear control response, measures of fear were included. The Fear Response Scale (Witte, 1992) includes a set of six questions that measure an individual’s level of fear after exposure to a message ( $M = 2.17$ ,  $SD = 1.31$ ,  $\alpha = .95$ ). Items were on a 1-7 scale, 1 being *not at all* and 7 being *extremely*. Items included things like: “How much did this message make you feel frightened?” and “How much did this message make

you feel uncomfortable?” The higher the number, the more fear the individual has. Individuals with high levels of fear will likely respond with fear control.

**Message rejection.** To measure message rejection, the Message Derogation measure (Witte, 1992) was used ( $M = 3.21$ ,  $SD = 1.54$ ,  $\alpha = .94$ ). The Message Derogation scale is comprised of a series of four questions, each focused on whether or not the individual believed that the message was of little worth. The measure uses a 1-7 scale, 1 being *strongly disagree* and 7 being *strongly agree*. The measure includes items such as: “this message was distorted,” “this message was overblown,” and “this message was exaggerated.”

**Manipulation checks.** Manipulation check items were created and piloted to ensure participants perceived the correct level of manipulation within the message. Manipulation checks were included for level of severity ( $M = 4.33$ ,  $SD = 1.75$ ,  $\alpha = .93$ ), susceptibility ( $M = 5.32$ ,  $SD = 1.25$ ,  $\alpha = .86$ ), self-efficacy ( $M = 5.18$ ,  $SD = 1.38$ ,  $\alpha = .90$ ), and response efficacy ( $M = 5.26$ ,  $SD = 1.14$ ,  $\alpha = .80$ ). All of the manipulation checks were on a 1-7 scale, 1 being *strongly disagree* and 7 being *strongly agree*. The manipulation checks included items for severity such as: “contracting SRS is dangerous” and “SRS is extremely harmful” in order to gauge participant’s perceptions of the messages. Items for susceptibility included things like: “I am very likely to contract SRS” and “I am vulnerable to contracting SRS.” Items to measure self-efficacy included things like: “There are many things that are within my power to do in order to avoid contracting SRS” and “I am confident I can use preventative measures to avoid contracting SRS.” Items for response efficacy included things like: “The behaviors listed in the article are an effective way to prevent becoming infected with SRS” and “If I implement the preventative procedures I decrease the chance of contracting SRS.”

### **Pilot Study**

A pilot study was conducted in order to determine the effectiveness of experimental manipulations before the main experiment was conducted. For the pilot study, the sample was largely Caucasian college students ( $N = 65$ ). Participants were randomly assigned to either high or low self-efficacy or response efficacy and either high or low severity or susceptibility conditions. To ensure reliability between the measures, Cronbach's alpha was calculated. Independent-samples t-tests were conducted to compare perceived levels of severity, susceptibility, self-efficacy, and response efficacy elicited by the designed messages. There were significant differences in the scores for the following: low self-efficacy measures ( $M = 3.95$ ,  $SD = 1.39$ ) and high self-efficacy measures ( $M = 5.60$ ,  $SD = 0.86$ ),  $t(33) = 4.75$ ,  $p = .000$ , low response efficacy measures ( $M = 4.15$ ,  $SD = 0.87$ ) and high response efficacy measures ( $M = 5.67$ ,  $SD = 1.07$ ),  $t(30) = 4.06$ ,  $p = .000$ , low susceptibility measures ( $M = 1.59$ ,  $SD = 0.76$ ) and high susceptibility measures ( $M = 3.42$ ,  $SD = 1.43$ ),  $t(30.14) = 6.32$ ,  $p = .000$ , and low severity measures ( $M = 2.51$ ,  $SD = 0.93$ ) and high severity measures ( $M = 5.94$ ,  $SD = 0.55$ ),  $t(18.19) = 11.86$ ,  $p = .000$ , indicating the manipulations were successful.

## Results

### Analytical Procedures

For this experiment, factorial ANOVAs with self-enhancement as a continuous independent variable were used to determine whether or not there were significant differences between individuals with high, moderate and low levels of self-enhancement, and how threat messages were interpreted. As will be discussed momentarily, as only a single test was significant, it appears self-enhancement has no bearing on the EPPM. Thus, a majority of the analysis was conducted without self-enhancement as true factorial ANOVAs to test the remaining hypotheses. Any analysis conducted with self-enhancement will be indicated.

**Manipulation Checks**

The manipulation checks in this study are reported in Table 2.

Table 2

*Manipulation Checks*

Independent Variable	Severity Manipulation Check		Susceptibility Manipulation Check		Self-Efficacy Manipulation Check		Response Efficacy Manipulation Check	
	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$
	$R^2 = 0.54$		$R^2 = 0.16$		$R^2 = 0.25$		$R^2 = 0.15$	
Severity (SEV)	305.90***	.53	2.84	.01	1.82	.01	0.14	.00
Susceptibility (SUS)	3.77	.01	41.63***	.13	5.97	.02	3.40	.01
Self-Efficacy (S-EFF)	1.17	.00	0.15*	.00	7.39***	.03	12.88***	.05
Response Efficacy (RE)	0.52	.00	0.24	.00	23.51***	.08	15.57***	.05
SUS*SEV	0.80	.00	0.02	.00	0.75	.00	0.91	.00
SUS*S-EFF	1.19	.00	0.48	.00	1.55	.01	1.69	.01
SUS*RE	3.81	.01	0.46	.00	0.00	.00	0.35	.00
SEV*S-EFF	0.15	.01	0.12	.00	0.36	.02	0.73	.00
SEV*RE	0.00	.00	0.12	.00	1.61	.01	0.85	.00
S-EFF*RE	0.43	.00	3.64	.01	1.16	.00	2.30	.01
SUS*SEV*S-EFF	0.39	.00	0.89	.00	0.82	.00	0.28	.00
SUS*SEV*RE	0.18	.00	0.13	.00	0.10	.00	0.06	.00
SUS*S-EFF*RE	0.01	.00	0.18	.00	3.14	.01	0.56	.00
SEV*S-EFF*RE	2.76	.01	0.33	.00	0.26	.03	7.63	.03
SUS*SEV*S-EFF*RE	0.36	.00	0.23	.00	1.18	.00	0.60	.00

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , two-tailed.

**Severity.** To understand the relationship between level of severity and the other manipulated items, such as susceptibility and self-efficacy, an ANOVA was conducted to ensure the success of the manipulation. The only significant main effect found was for severity on the severity manipulation check (see Table 2). As predicted, low severity condition messages were perceived to be less severe ( $M = 3.09$ ,  $SD = 1.25$ ) than high severity condition ( $M = 5.60$ ,  $SD = 1.20$ ). Thus, the manipulation was considered successful.

**Susceptibility.** After conducting an ANOVA test, there was a significant main effect for susceptibility on the susceptibility manipulation check (see Table 2). Surprisingly, in low susceptibility condition messages ( $M = 5.78$ ,  $SD = 1.10$ ) individuals perceived a higher level of susceptibility than within high susceptibility condition messages ( $M = 4.88$ ,  $SD = 1.24$ ). Thus, the manipulation was unsuccessful.

**Self-Efficacy.** Running the ANOVA on self-efficacy revealed there was a significant main effect for self-efficacy on the self-efficacy manipulation check (see Table 2). Individuals were more likely to perceive higher levels of self-efficacy in the high self-efficacy condition ( $M = 5.50$ ,  $SD = 1.31$ ) compared to low self-efficacy condition ( $M = 4.85$ ,  $SD = 1.37$ ). Additionally, there was a significant main effect for the self-efficacy measure on the susceptibility manipulation (see Table 2). At low levels of susceptibility ( $M = 5.35$ ,  $SD = 1.37$ ), individuals were less likely to perceive self-efficacy than at high levels of susceptibility ( $M = 5.01$ ,  $SD = 1.37$ ). Finally, there was a significant main effect for the self-efficacy measure on the response efficacy manipulation (see Table 2). At low levels of response efficacy ( $M = 4.74$ ,  $SD = 1.42$ ), individuals were more likely to perceive higher levels of self-efficacy than at high levels of response efficacy ( $M = 5.63$ ,  $SD = 1.18$ ). Because it seems only natural there is some connection between self-efficacy and response efficacy, it is understandable how the response

efficacy manipulation may have affected the self-efficacy manipulation check. Nonetheless, the significant effect for the self-efficacy manipulation suggests that the manipulation was successful.

**Response efficacy.** Two main effects were found for level of response efficacy. The first was for response efficacy on self-efficacy (see Table 2), which showed that at lower levels of response efficacy ( $M = 5.04$ ,  $SD = 1.14$ ), individuals also perceived lower levels of self-efficacy. Conversely, at higher levels of response efficacy ( $M = 5.49$ ,  $SD = 1.11$ ), individuals perceived higher levels of self-efficacy. The second main effect was for response efficacy on the response efficacy manipulation check (see Table 2). Messages with low levels of response efficacy elicited lower levels of response efficacy ( $M = 5.00$ ,  $SD = 1.10$ ), and messages with higher levels of response efficacy elicited higher levels of response efficacy ( $M = 5.52$ ,  $SD = 1.14$ ). As previously mentioned, response efficacy and self-efficacy are very closely related concepts. Despite the self-efficacy manipulation's effect on the response efficacy measure, the manipulation of response efficacy was considered successful.

### **Data Analysis with Self-Enhancement**

As previously mentioned, there were few significant results when the data analysis was conducted including self-enhancement, indicating that self-enhancement has little effect on the outcomes associated with the EPPM. The following table (Table 3) is analyzed including self-enhancement.

Table 3

*Analysis with Self-Enhancement*

Independent Variable	Dependent Variable					
	Behavioral Intention		Fear Response		Message Derogation	
	$R^2 = 0.15$		$R^2 = 0.11$		$R^2 = 0.07$	
	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$
Severity (SEV)	0.88	.00	4.55	.02	0.82	.00
Susceptibility (SUS)	7.86**	.03	1.17	.00	0.72	.00
Self-Efficacy (S-EFF)	7.09**	.03	2.75	.01	3.98	.02
Response Efficacy (RE)	5.41**	.02	2.45	.00	0.72	.00
Self-Enhancement (S-ENH)	0.09	.00	0.76	.00	1.88	.01
SUS*SEV*S-ENH	0.00	.00	0.02	.00	0.24	.00
SUS*S-EFF	1.78	.01	2.46	.01	1.69	.01
SUS*RE*S-ENH	0.04	.00	0.23	.00	0.06	.00
SEV*S-EFF	3.00	.01	0.03	.00	0.82	.00
SEV*RE*S-ENH	0.74	.00	0.49	.00	1.09	.00
S-EFF*RE*S-ENH	2.68	.01	1.77	.01	0.01	.00
SUS*SEV*S-EFF*S-ENH	0.59	.00	0.00	.00	0.10	.00
SUS*SEV*RE*S-ENH	0.01	.00	0.69	.00	0.36	.00
SUS*S-EFF*RE	0.47	.01	0.59	.01	0.28	.00
SEV*S-EFF*RE*S-ENH	0.01	.00	1.31	.01	1.80	.01
SUS*SEV*S-EFF*RE*S-ENH	0.39	.00	1.43	.01	0.19	.00
SUS*S-ENH	2.52	.01	0.02	.00	0.01	.00
SUS*S-EFF*S-ENH	0.87	.00	0.05	.00	2.71	.01
SEV*S-EFF*S-ENH	7.05**	.03	0.05	.00	0.95	.00
SUS*S-EFF*RE*S-ENH	0.08	.00	0.13	.00	0.79	.00

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , two-tailed.

Of all of the analyses conducted (see Table 3), all but one of the tests yielded insignificant corrected models, rendering the tests statistically insignificant. The statistically insignificant models were for fear response,  $F(25, 266) = 1.36, p = .12$ , and message derogation,  $F(25,266) = 0.84, p = .69$ . However, the overall model was significant for behavioral intention,  $F(25,266) = 1.86, p = .01$ . The main effect for self-enhancement on behavioral intention was not significant,  $F(25,266) = 0.09, p = .77$ . The main effect for severity was not significant,  $F(25,266) = 0.88, p = .35$ . The main effect for self-efficacy was significant,  $F(25,266) = 7.09, p = .01$ . A significant relationship was found between the interaction of self-enhancement, severity, and self-efficacy and behavioral intention (see Table 3). The results of a simple slopes analysis using PROCESS (see Table 4), indicated that when self-enhancement was high and severity was high, self-efficacy had a positive effect on behavioral intention.

Table 4

*PROCESS Effect of Self-Efficacy on Behavioral Intention at Varying levels of Self-Enhancement and Severity*

Self-Enhancement	Severity	B	SE	<i>t</i>	<i>p</i>	Lower Level Confidence Interval	Upper Level Confidence Interval
Low	Low	0.38	0.25	1.53	.13	-0.11	0.86
Low	High	0.13	0.25	0.53	.59	-0.35	0.60
Mean	Low	0.08	0.17	0.48	.63	-0.25	0.42
Mean	High	0.32	0.17	1.87	.06	-0.02	0.66
High	Low	-0.21	0.25	-0.85	.40	-0.70	0.28
High	High	0.52	0.24	2.16	.03	0.05	0.99

Because of the lack of statistical evidence for the majority of the results,  $H_1$ , which stated that individuals with high levels of self-enhancement would respond with message rejection when presented with a message regardless of the level of severity, susceptibility, self-efficacy, or response efficacy, was not supported. The evidence suggested a lack of effect of self-enhancement in combination with efficacy and threat on EPPM outcomes. The hypotheses were generally not supported. However, subsequent analyses were conducted to assess the potential effect of the experimental variables on the EPPM outcomes in the absence of self-enhancement.

#### **Data Analysis without Self-Enhancement**

The following table shows data analysis without self-enhancement.

Table 5

*Analysis without Self-Enhancement*

Independent Variable	Dependent Variable					
	Behavioral Intention		Fear Response		Message Derogation	
	$R^2 = 0.10$		$R^2 = 0.09$		$R^2 = 0.05$	
	F	$\eta^2$	F	$\eta^2$	F	$\eta^2$
Severity (SEV)	3.29	.01	8.15**	.03	0.21	.00
Susceptibility (SUS)	4.37**	.02	3.23	.01	1.31	.01
Self-Efficacy (S-EFF)	2.39	.01	0.14	.00	4.73**	.02
Response Efficacy (RE)	10.22**	.04	0.08	.00	0.24	.00
SUS*SEV	0.00	.00	0.58	.00	0.28	.00
SUS* S-EFF	0.38	.00	4.68**	.02	0.02	.00
SUS*RE	0.47	.00	0.20	.00	0.21	.00
SEV* S-EFF	1.01	.00	0.01	.00	0.00	.00
SEV*RE	0.18	.00	0.90	.00	2.85	.01
S-EFF *RE	2.06	.01	2.38	.01	1.10	.00
SUS*SEV*S-EFF	0.00	.00	1.28	.01	0.05	.00
SUS*SEV*RE	0.09	.00	0.25	.00	0.72	.00
SUS*S-EFF*RE	1.55	.01	0.72	.00	0.01	.00
SEV*S-EFF*RE	0.95	.00	3.56	.01	0.94	.00
SUS*SEV*S-EFF*RE	2.71	.01	1.87	.01	0.22	.00

Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , two-tailed.

**Behavioral intention.** As seen in Table 5, there was a significant main effect for susceptibility on behavioral intention. Individuals in the low susceptibility group were less likely to change behavioral intention ( $M = 2.14$ ,  $SD = 0.95$ ) than those in the high susceptibility group ( $M = 2.39$ ,  $SD = 1.13$ ). Recall that the susceptibility manipulation check was actually significant in an unexpected direction, so those who experienced more susceptibility (in the low susceptibility group) actually had lower intention. There was also a significant main effect for response efficacy on behavioral intention (see Table 5). Contrary to what would be expected, individuals in the lower response efficacy condition were more likely to change behaviors ( $M = 2.46$ ,  $SD = 1.10$ ) than those in the high response efficacy condition ( $M = 2.08$ ,  $SD = 1.02$ ). Even with these significant findings, there was no support for  $H_2$  or  $H_5$ .

**Fear response.** There was a significant main effect for severity on fear response (see Table 5). As message severity increased ( $M = 1.95$ ,  $SD = 1.18$ ), individuals were more likely to respond with a fear response ( $M = 2.34$ ,  $SD = 1.40$ ). This does not support  $H_4$ , which states that without self-enhancement, individuals will respond with fear control when presented with a message that has high severity, high susceptibility, and low self-efficacy, regardless of the level of response efficacy.

**Message Derogation.** The only significant relationship with message derogation was a main effect for self-efficacy (see Table 5). At low levels of self-efficacy ( $M = 3.41$ ,  $SD = 0.13$ ), individuals were less likely to respond with message derogation than in the high self-efficacy condition ( $M = 3.02$ ,  $SD = 0.13$ ). This does not support  $H_3$ , which states that without self-enhancement, individuals will respond with message rejection when presented with a message that has high severity, low susceptibility, high or low self-efficacy, and high or low response efficacy.

### Discussion

This experiment examined the effect that self-enhancement had on the outcomes associated with extended parallel process model (EPPM), whilst also trying to address some of the theoretical and measurement issues that exist in the EPPM. One of the main goals of this experiment was to study how self-enhancement impacted the evaluation of threat messages. Although self-enhancement significantly interacted with self-efficacy and severity to effect behavioral intention, the overall evidence suggests that the outcomes of the EPPM are little effected by self-enhancement.

As mentioned above, behavioral intention was effected by self-enhancement, but only through a complex relationship with severity and self-efficacy. This relationship, i.e., only when self-enhancement was high and severity was high, did self-efficacy have a significant positive effect on behavioral intention, demonstrates the complex nature of how self-enhancement moderates the relationships within the EPPM. One possible explanation for the complex relationship between self-enhancement, severity, and self-efficacy on intended behavior change is that there is a certain level of stimulation that must be met in order for individuals to engage in self-enhancement. Arkin (1981) stated that individuals engage in self-enhancement as a form of self-protection, in order to diminish the impact of negative information, but little is known about how this processes begins. Because the process is an unconscious psychological process that is automatically employed (Sedikides & Gregg, 2008), it is highly likely that there is a certain level of stimuli required in order to engage in self-enhancement. It is possible that the condition, high severity and high self-efficacy which elicited the self-enhancement response within the experiment, was at just the right levels which acted as a catalyst for the individuals to engage in self-enhancement. Self-enhancement did not activate in the low severity condition because there

was not enough stimulus present (i.e., there was not enough threat for an individual to subconsciously realize protection was needed).

Though there was only one overall significant model when analyzing the data with self-enhancement, further analysis conducted without self-enhancement produced significant results. One important result was different variables affected fear control, intended behavioral change, and message derogation (referred to in the EPPM as message rejection). Individuals were more likely to respond with fear control in conditions that had higher severity. Self-efficacy was found to affect message derogation; the more self-efficacy individuals were exposed to, the less likely they were to reject the message. Subsequently, individuals were more likely to respond with intended behavior change when susceptibility was low and there was an inverse relationship between response efficacy and intended behavior change. These results, when viewed holistically, show that each element of threat and efficacy evaluations do function differently and should be viewed as distinct variables.

In the original EPPM, threat is composed of severity and susceptibility; as long as one of those elements was high, the overall message was seen to be threatening and therefore prompted the individual to respond (Witte, 1992). In this experiment, however, fear control was only affected by the level of severity. Fear control was more likely to occur for individuals who were exposed to high levels of severity. Though this finding does align with the predictions of the EPPM, it is important to acknowledge that this finding supports the idea that severity is appraised differently from susceptibility.

Another finding that supported the current EPPM predictions was the likelihood of message derogation. The EPPM predicts that if individuals perceive efficacy to be low, they are more likely to respond with message rejection (Witte, 1992). In this experiment, individuals

who perceived high levels of self-efficacy were less likely to respond with message rejection, mirroring the findings of the EPPM. Though the experiment supported the prediction of the EPPM, it is important to note that the self-efficacy manipulations also inadvertently manipulated response efficacy (see Table 2). Without a completely isolated self-efficacy manipulation, it is not possible to tell whether or not self-efficacy or response efficacy contributed to the outcome of message rejection.

One finding that did not support the current EPPM predictions was found when analyzing behavioral intention. In the experiment, when response efficacy was low, individuals were more likely to respond with intended behavior change. Additionally, when the susceptibility condition was low, a condition that actually elicited greater perceived susceptibility, individuals reported lower intended behavior change. These findings contradict what the EPPM predicts, which is that individuals with low efficacy will be less likely to respond with behavior change and, conversely, that individuals with high efficacy be more likely to respond with behavior change (Witte, 1992). One possible explanation for this finding is that low response efficacy elicited a concept called The Planning Fallacy. The Planning Fallacy occurs when individuals underestimate the negatives and/or overemphasize their own chance of succeeding when presented with information that must be evaluated (Kahneman, 2011b). Instead of evaluating whether or not individuals feel they can enact preventative measures, like in self-efficacy, the locus is on external factors, such as what treatments are available and if those treatments are effective, when looking at response efficacy (Witte, 1992, 1994b). Because the locus is no longer centered on the individuals' beliefs in themselves, it is possible individuals followed the predictions of The Planning Fallacy, ignoring data and instead focusing on what they believe to be true (Kahneman, 2011b).

Additionally, as seen when conducting the manipulation check for susceptibility, it was indicated that the messages that had seemingly more susceptibility language actually produced a lower overall perceived level of susceptibility for the individuals within this study. Though this result may seem counterintuitive, it is possible susceptibility, as constructed in this experiment, mirrored some of El-Toukhy's (2015) findings in which individuals perceived more overall susceptible when asked about common illnesses and perceived less susceptibility when asked about rare conditions. Individuals might have thought they were more susceptible when asked about familiar illnesses because of the participant's familiarity with the common illnesses. Because susceptibility conditions included language like "airborne" vs. "human-to-human contact," it is possible participants were more familiar with airborne spread illnesses than what is necessary for illness to spread through human-to-human contact. The same phenomenon seen in El-Toukhy's (2015) study would explain why airborne conditions were thought to be less susceptible than the human-to-human contact conditions.

One limitation within the study was manipulating one variable at a time in the manipulated messages. As previously mentioned, there are theoretical similarities between self-efficacy and response efficacy that led to the difficulty of manipulation of one without manipulating the other. This link may have caused individuals to assume varied levels of response efficacy depending on the level of self-efficacy and vice versa. Similarly, the study results showed that as self-efficacy was manipulated, susceptibility was inadvertently effected. At the low susceptibility condition, by which more susceptibility was actually perceived than in the high susceptibility condition, individuals perceived less self-efficacy than in the high susceptibility condition. Because the manipulations affected more than the intended variables, it is difficult to deduce which variables contribute to the outcomes.

Although the online design of this experiment did enable a large sample population to take part, there were potential limitations from using an online platform to collect data. Using an online platform to expose participants to experimental groups, though convenient, does not offer the same control that would be available in a laboratory setting. There are myriad factors that could have distracted participants while participating in the study. These distractions and discrepancies between participants could potentially have been minimized had this study been conducted in a laboratory, though undoubtedly the sample size would have suffered.

It was initially proposed that self-enhancement would affect the outcome of the Extended Parallel Processing Model because self-enhancement was believed to be activated in the presence of threat (Harre et al., 2005). The activation of self-enhancement, initiated by threat, would then cause individuals with higher levels of self-enhancement to under-estimate the level of threat and over-estimate positive self-characteristics (Harre et al., 2005). Although it was anticipated that individual would focus on positive information, in turn causing low threat evaluations, and therefore causing the individual to reject the message outright, regardless of the level of overall efficacy, no such evidence was found.

An additional goal of this study was to contribute to the theoretical knowledge base that suggested that threat appraisal and efficacy appraisal should be broken down into more distinct variables, namely susceptibility and severity for threat appraisal and self-efficacy and response efficacy for efficacy appraisal, for more accurate predictions from the EPPM. Though isolating individual variables within messages proved to be difficult, the importance of isolation can be seen when interpreting the results. As evident throughout the data, different elements contributed to the various outcomes of the EPPM. Severity was found to have a significant main effect on fear response, and susceptibility was found to have a significant main effect on

behavioral intention. These findings indicated different variables within threat evaluation lead to different outcomes, which further support the separation of threat variables, while still indicating some of the original predictions of the EPPM proved to be true. Though it is difficult to make the same claim based on the study results about efficacy evaluation, further studies would need to be conducted with threat messages.

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**Appendix A****Survey Consent to Participate**

Texas Christian University  
Fort Worth, Texas

**CONSENT TO PARTICIPATE IN RESEARCH**

**Title of Research:** Evaluating Health-Related Current Events in News Articles

**Funding Agency/Sponsor:** N/A

**Study Investigator(s):** Adam Richards, Ph.D., Gabrielle Barnes

**What is the purpose of the research?** To examine how readers of news articles evaluate the evidence presented in reports of health-related current events.

**How many people will participate in this study?** 300-350 people

**What is my involvement for participating in this study?**

For this study you will be asked to read a news article and answer a series of questions about your perceptions of the material covered in the article.

**How long am I expected to be in this study for and how much of my time is required?**

This study should take approximately 25-30 minutes to complete.

**What are the risks of participating in this study and how will they be minimized?** Some participants may feel mildly uncomfortable reading about and answering questions about the health topic. You are free to withdraw your participation at any time. You may decline to answer any question, or stop the questionnaire at any time.

**What are the benefits for participating in this study?** This study will give a greater understanding for how people process messages about health-related issues.

**Will I be compensated for participating in this study?** TCU students will receive credit for participating in the study while enrolled in basic level communication courses.

**What is an alternate procedure(s) that I can choose instead of participating in this study?**

An alternative assignment will be provided to those students who do not wish to participate in the study. The alternative assignment involves reading a scholarly journal article in the field of persuasion and health communication and writing a summary of the findings.

**How will my confidentiality be protected?** At no time will your responses on this survey be linked to your identity. Your name, location, or other identifying data will not be included with any reporting of this data. Data will be available only to the researchers, stored in locked offices.

**Is my participation voluntary?** Yes.

**Can I stop taking part in this research?** You are free to withdraw your participation at any time. You may stop taking the questionnaire at any point. While incentive for participation will be provided for TCU students who complete the survey through the form of assignment credit, you will be provided with an alternative assignment of equal point value should you wish to withdraw from the study.

**What are the procedures for withdrawal?** If you wish to withdraw, you may exit the online survey at any time. Then, if completing the survey for course or extra credit, you may consult your instructor for an alternative option.

**Will I be given a copy of the consent document to keep?** Yes.

**Who should I contact if I have questions regarding the study?**

Gabrielle Barnes: [g.barnes@tcu.edu](mailto:g.barnes@tcu.edu)

Dr. Adam Richards, Ph.D.: [adam.richards@tcu.edu](mailto:adam.richards@tcu.edu)

**Who should I contact if I have concerns regarding my rights as a study participant?**

Dr. Dan Southard, Chair, TCU Institutional Review Board, Phone [817 257-6869](tel:8172576869).

Dr. Bonnie Melhart, TCU Research Integrity Office, Telephone [817-257-7104](tel:8172577104).

By clicking “I agree to participate” you have indicated that you have read or been read the information provided above, you have received answers to all of your questions and have been told who to call if you have any more questions, you have freely decided to participate in this research, and you understand that you are not giving up any of your legal rights.

- I agree to participate
- I do not wish to participate

**Appendix B****The Adapted Familiarity Questionnaire (Paulhaus & Harms, 2003)**

Q85 Please rate your familiarity with each item on this questionnaire. Use the scale below as a guide.

0	1	2	3	4	5	6
Never Heard Of It						Very Familiar

For example, if the item said "Barack Obama" or "Mexico", or "the Bible", you would probably write a '6' beside it because it is very familiar. However, if the item said "Fred Gruneberg" (my next door neighbor) you would write a '0' to indicate you never heard of him.

e.g.,      6 Barack Obama                      0 Fred Gruneberg













## Appendix C

## Message Manipulations

	High	Low
<b>Title (Severity)</b>	Deadly disease discovered in	Mild disease discovered
<b>Title (Susceptibility)</b>	Tarrant County, is likely to spread quickly	in South America, is likely not to spread
Byline Response Efficacy	There are <i>many ways to prevent</i> getting the disease.	There <i>are few ways to prevent</i> getting the disease,
Byline Self-Efficacy	You can <i>easily</i> engage in these behaviors.	but you may find it <i>difficult</i> to engage in these behaviors.
<b>Susceptibility</b>	South-American Respiratory disease (SRS) is a new disease recently identified in the <i>Northern regions</i> of South America that is <i>beginning to spread to areas of Texas. New cases have recently been discovered in Tarrant County.</i> The new infection is <i>airborne, spreading rapidly when humans are in close proximity to one another.</i> Due to its <i>highly</i> contagious nature, scientists are <i>extremely concerned</i> with the number of potential infections within the coming year.	South-American Respiratory disease (SRS) is a new disease recently identified in the <i>Southern regions</i> of South America that appears to be confined to areas of Argentina. The new infection is contracted through <i>human-to-human contact, spreading slowly only when humans exchange bodily fluids.</i> Due to its <i>mild</i> contagious nature, scientists are only <i>slightly concerned</i> over the number of potential infections within the coming year.
<b>Severity</b>	Those who have been infected with SRS quickly develop <i>severe</i> respiratory issues, <i>high</i> fever, and <i>extreme</i> weight loss over a <i>very short</i> period of time. Of all of the reported cases thus far, <i>many</i> of those infected have died.	Those who have been infected with SRS quickly develop <i>minor</i> respiratory issues, <i>low</i> fever, and <i>mild</i> weight loss over <i>an extended</i> period of time. Of all of the reported cases thus far, <i>none</i> of those infected have died.
<b>Response Efficacy</b>	There are <i>many</i> things that can be done to prevent contracting SRS. Common behaviors like: <ul style="list-style-type: none"> <li>• washing hands frequently</li> </ul>	There are <i>few</i> things that can be done to prevent contracting SRS. Common behaviors like: <ul style="list-style-type: none"> <li>• avoiding contact with those</li> </ul>

<p><b>(frequency)</b></p>	<ul style="list-style-type: none"> <li>• avoiding contact with those you know are at risk of infection</li> <li>• seeing your healthcare provider for regular health screenings</li> <li>• avoiding food from unknown origins</li> <li>• avoiding immunosuppressant behaviors like smoking, recreational drug use, etc.</li> </ul> <p><i>will decrease the likelihood of you getting the disease</i></p> <p>“The <i>fortunate</i> thing about SRS is that there are <i>many</i> behaviors one can adapt in order to control the likelihood of infection,” says Center for Disease control specialist, Dr. Franklin Keller.</p>	<p>you know are at risk of infection</p> <ul style="list-style-type: none"> <li>• seeing your healthcare provider for regular health screenings</li> <li>• avoiding food from unknown origins</li> </ul> <p><i>Behaviors like washing hand frequently, will not decrease the likelihood of you getting the disease.</i></p> <p>“The <i>unfortunate</i> thing about SRS is that there are <i>limited</i> behaviors one can adapt in order to control the likelihood of infection,” says Center for Disease control specialist, Dr. Franklin Keller.</p>
<p><b>Self-Efficacy</b></p>	<p>The <i>fortunate</i> news is that you have the ability to prevent getting SRS by engaging in these behaviors. The behaviors mentioned above can be <i>easily</i> integrated into your daily routine. <i>With such simple steps you are fully in control</i> to prevent contracting this disease.</p>	<p>The <i>unfortunate</i> news is that you do not really have the ability to prevent getting SRS. The behaviors mentioned above are <i>difficult</i> to integrate into your daily routine. <i>With such difficult steps you do not</i> have full control to prevent contracting this disease.</p>

## Appendix D

## Message Exposure

**High Severity, Low Susceptibility, High Self-Efficacy, High Response Efficacy.**



HEALTH OCTOBER 16, 2015

## Deadly disease discovered in South America is likely not to spread.

There are many ways to prevent getting the disease. You can easily engage in these behaviors.



South-American Respiratory disease (SRS) is a new disease recently identified in the Southern regions of South America that appears to be confined to areas of Argentina. The new infection is contracted through human-to-human contact, spreading slowly only when humans exchange bodily fluids. Due to its mild contagious nature, scientists are only slightly concerned over the number of potential infections within the coming year.

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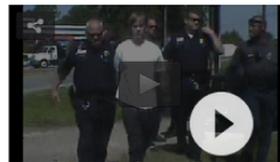
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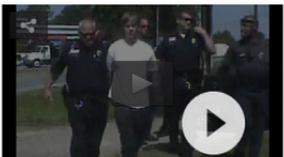
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**Susceptibility.**

Q97 Using the provided scale, rank how much you agree with the following statements:

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
I am very likely to contract SRS. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am very vulnerable to SRS. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is unlikely I will contract SRS. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My chances of contracting SRS are great. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that my chances of contracting SRS in the future are good. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Self-Efficacy.**

Q98 Rank how much you agree with the following statements using the scale provided:













## Appendix I

### General Demographic Questions

Q146 Please answer the following demographic questions.

Q147 What is your biological sex?

- Male (1)
- Female (2)
- I prefer not to disclose this information (3)

Q148 What gender do you identify with?

- Male (1)
- Female (2)
- Other (3)
- I prefer not to disclose this information (4)

Q149 What is your age?

Q150 What is the highest level of education you have completed?

- Attended but did not complete high school (1)
- High school degree or equivalent (GED, etc.) (2)
- Some college (3)
- Bachelor's degree (4)
- Attended but did not complete Master's (5)
- Master's degree (6)
- Other (Please specify) (7) \_\_\_\_\_

Q151 Which geographic region did you grow up in?

- Northern United States (1)
- Southern United States (2)
- Canada (3)
- United Kingdom (4)
- Eastern Europe (excluding the United Kingdom) (5)
- Western Europe (6)
- Eastern Asia (7)
- Western Asia (8)
- Africa (9)
- South America (10)
- Other (please specify) (11) \_\_\_\_\_

Q152 What race do you identify with?

- Asian (1)
- African American (2)
- Caucasian (3)
- Hispanic (4)
- Latina/Latino (5)
- Other (please specify) (6) \_\_\_\_\_

## Appendix J

### Debrief Statement



Texas Christian University  
Fort Worth, Texas

### DEBRIEF STATEMENT

We are Dr. Adam Richards, Assistant Professor, and Gabrielle Barnes, graduate student, researchers with Texas Christian University's Department of Communication. The purpose of this study was to determine if varied levels of self enhancement effect the perception of threat based persuasion messages. Past research asserted that people react to threat based messages based on the evaluation of the how susceptible they are to the illness, how severe the disease is, how self-empowered they feel to enact preventative behaviors, and how many options are available for prevention of the disease and whether or not the prevention behaviors are effective. Research has also show that individuals with higher levels of self enhancement focus on positive information and underestimate any negative information they receive as a means of self-protecting. In this study, we were interested in determining whether or not an individuals' trait level of self enhancement effected the way they responded to threat based persuasion messages. To do this, we created threatening messages and measured your existing level of self enhancement. You have just read information about South-American Respiratory disease (SRS) purportedly produced by the Fort Worth Star-Telegram. In fact, this was not real information produced by Fort Worth Star-Telegram, and SERS does not exist.

You were asked to participate in the study because you are in a communication undergraduate class. You are one of approximately 300 people in the study. We are sorry that we had to be mildly deceptive in order to gain this understanding. We did not mean to harm you in any way at all, but rather want to understand communication and persuasion. Please don't tell fellow students about the content of this study, because they may participate in the study later on in the semester.

Sincerely,

Dr. Adam Richards  
Gabrielle Christine Barnes