

**TO FEAR OR NOT TO FEAR:
AN EXAMINATION OF FEAR APPEALS
IN HEALTH MESSAGING BY MESSAGE
FRAME AND BEHAVIOR REQUEST**

by

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ABSTRACT

The purpose of this study is to examine the mechanisms through which fear appeals operate –the fear control process or danger control process – and how message frame and behavior request play a role in the activation of either process. Two hundred ninety-five male and female undergraduate students recruited from large Communication courses were randomly assigned to read one of the sixteen health messages manipulated by message topic, frame, and behavior request. Participants rated their level of fear, anxiety, and intention to perform the respective behavior.

The results indicated that message frame and message request did not have any effects on level of fear, anxiety, or intention. However, message topic did effect level of fear and intention. This information is useful to marketing and public health practitioners trying to understand which health issues to focus on when targeting this population. A stronger manipulation and more precise measures could improve the study if replicated.

Chapter 1

INTRODUCTION

Fear has long been a tactic utilized in persuasive messages, particularly within health messaging. Researchers across various fields such as communication, psychology, and marketing have been trying to understand the effectiveness of injecting fear into messages and how it works to increase persuasiveness (Tanner, Hunt, & Eppright, 1991). Many of the findings have been inconsistent, largely due to the varying conceptualizations of fear and additional factors that interact with fear. Other factors that can influence the effectiveness of a persuasive message are the ways a message is framed and the type of behavior being advocated. Messages can be gain-framed, which are positive and emphasize benefits, or loss-framed, which are negative and emphasize consequences. The requested behaviors in messages can advocate adoption or cessation of behaviors, in other words, to engage in a behavior or to stop it.

Nabi (2003) discussed framing theory, stating that “the way in which information is presented, or the perspective taken in a message, influences the responses individuals will have to the issue at hand” (p. 225). She explained that different frames can impact people’s understanding of certain issues and how to solve them, due to biases in information accessibility. Jang and Feng (2018) discussed how people responded to advice based on whether the message was gain-framed or loss-framed. Gain-framed messages are those which place emphasis on the benefits one can accrue by taking a specific course of action. In contrast, loss-framed messages

emphasize the negative consequences that can result by taking or not taking an action. Although their study looked at this type of framing in regard to advice, the application to persuasive health messages is notable. The authors based their research in prospect theory, which contends that “individuals’ decisions are contingent on how information is represented and more specifically, how the information is framed” (p. 183).

Framing Theory

First posited by Kahneman and Tversky (1979), prospect theory seeks to understand how individuals make decisions when outcomes are uncertain. Harrington and Kerr (2017) explained that according to the theory, “when faced with decisions involving potential gains, people tend to avoid risky (uncertain) outcomes, and when faced with decisions involving potential losses, they are more likely to seek risky (uncertain) outcomes” (p. 132). The theory explores the role of risk in decision-making, and how the presence of risk interacts with the qualities of a message.

In their study, Tversky and Kahneman (1981) measured individuals’ decisions based on the message frame and level of certainty of the outcomes. One message was gain-framed, indicating how many lives would be saved by a program being proposed, whereas the other was loss-framed, indicating how many deaths would occur by a program being proposed. Each message had conditions where the program outcomes were seen as low-risk, or certain, or seen as high-risk, or uncertain.

In the gain-framed condition, most people chose the low-risk/certain outcome program, displaying individuals’ likelihood to avoid risk in the presence of gains. In contrast, most people in the loss-framed condition chose the high-risk/uncertain outcome program, demonstrating individuals’ tendency to bear risk in the presence of losses. These findings support the notion advanced by prospect theory that uncertainty

plays a role in how people make decisions and serves as a foundation for the exploration of the effects of message framing.

Jang and Feng (2018) cited past research that states gain-framed messages are more persuasive with low-risk behaviors, such as disease prevention, whereas loss-framed messages are more persuasive with high-risk behaviors, such as disease detection. Kang and Lin (2015) summarized past research, concluding that gain-framed messages were more effective in intention to quit smoking. The rationale behind this was that the gain-frame can accentuate the benefits of quitting and make the perceived burden of quitting smoking seem less severe.

In line with past research and the results found by Jang and Feng (2018), O’Keefe and Jensen (2008) also found that gain-framed messages are more engaging and effective. Thus, I expand on these findings and explore whether differences exist between the two types of frames in persuasive health communication messages. The differences will reveal which frame leads an individual to take on a protective action and appropriate coping behavior against a threat.

H1: Individuals who are exposed to gain-framed messages have a greater intention to perform an appropriate coping behavior than individuals exposed to loss-framed messages.

On the other hand, Casais and Proença (2015) noted that these findings are not so clear. They stated that the conclusions drawn about the effectiveness of positive and negative frames are inconsistent, which they claim may be due to errors in classifying messages. Because messages often contain a mix both positive and negative affect, the classification of these messages as positive or negative can be inaccurate. In response, these researchers proposed a model for the qualitative

analysis of positive and negative message frames. Their model includes elements such as the story concept, verbal communication, slogan, non-verbal communication, rhetorical figures, colors, signs in the environment, and characters. Drawing from this, I will design my message stimuli so that messages conceptualized as gain- and loss-framed are mutually exclusive and exhaustive to ensure validity.

O’Keefe and Jensen (2008) pointed out that the effectiveness of gain or loss-framed messages would depend on the behavior under question. As stated previously, Jang and Feng (2018) mentioned that gain frames are more effective with low-risk behaviors, and loss frames for high-risk behaviors. This makes sense, as a gain-framed message for a low-risk behavior likely increases efficacy and allows the individual to easily benefit from taking action. A loss-framed message for a high-risk behavior, on the other hand, likely increases the severity of the threat, inducing fear in the individual (So, Kuang, & Cho, 2016). Therefore, to resolve some of the inconsistencies in examining the effectiveness of gain- and loss-framed messages, one should control the behavior under question to avoid confounding results. In the current study, a pretest was conducted to ensure that the behaviors are similar in their level of risk across conditions.

Witte and Allen (2000) stated that fear appeals are most effective in the presence of high perceived efficacy. Thus, fear messaging should include coping behaviors as a way for the message receiver to feel efficacious and take action. In considering future research, Tanner et al. (1991) questioned whether differences exist based on the nature of the behavior in question. Specifically, whether the stimulus encourages adoption of a positive behavior or cessation of a negative behavior. Thus far, researchers have not conducted studies that compare the effects of both persuasive

messaging (“don’t tan” vs. “wear sunscreen”). Therefore, exploring whether the way a message is framed and the nature of the requested behavior influence the persuasive impact of a message is notable both individually and combined.

Cessation versus Adoption

Many studies thus far have advocated for the cessation of a behavior, such as quitting smoking. For example, Kang and Lin (2015) tested the effects of antismoking ads, specifically looking at visual-fear appeals and message framing. In contrast, some studies such as the one conducted by Hammond and McDonald (2004) look at adoptive behaviors. The researchers studied the awareness of adoptive cessation methods (wearing nicotine patch, chewing nicotine gum, counseling, etc.). Similarly, Luszczynska and Schwarzer (2010) researched breast self-examinations. Both types of behaviors have been studied individually, but the extant research has not compared the two. Although differences have not been recognized between the types of actions, I predict that the differences will be notable and should be studied.

Williams (1982) described the differences between passive and active actions. He explained that a spectrum of different measures requires differing levels of effort for an individual to be protected. Passive measures require no effort or action for an individual to have protection from harm, whereas active measures require an individual to perform some type of action and exert effort to be protected from a threat. The largest benefit of passive measures is that they can be helpful to everyone and are not discriminatory. On the other hand, active measures obligate each person in the population of interest to perform a behavior to be protected, and other factors can stand in the way of completing the action.

Therefore, Williams (1982) asserted that active measures do not usually result in everyone completing the action, and that “major health gains have been more the result of implementing passive measures at the community level, or relatively passive measures involving limited action on the part of individuals, rather than measures that require frequent actions on the part of each individual to be protected” (p. 400).

Consequently, I predict that the passive nature of cessation will be more effective than the active nature of adoption.

H2: Individuals will have a greater intention to perform a behavior if it encourages cessation of a behavior rather than adoption.

Fear versus Anxiety

Many of the inconsistencies in fear appeal research are due to the varying definitions and conceptualizations of fear. So et al. (2016) distinguished differences between fear and anxiety and asserted that they be treated differently, based on research from cognitive appraisal theory and functional emotion theory. Born out of Darwin’s (1872/1965) work on evolution, these theories contend that emotions serve an important function for humans. These evolutionary perspectives argue that when activated, emotions direct behavior to perform adaptive responses in order to survive. Different emotions serve different functions, directing behavior to perform the goals/functions of the emotion aroused. In fear appeal research, fear and anxiety are the emotions evoked by threatening messages, deserving a closer look.

Differing levels of brain activity in response to fear and anxiety also led many scholars to believe these emotions are distinct and not interchangeable. Sylvers, Lilienfeld, and LaPrairie (2010) outlined an extensive summary of literature that has found neurobiological differences between fear and anxiety. They stated that “trait

fear appears to result, in part, from an underactive extinction circuit...trait anxiety appears to result largely from a hypersensitive appraisal circuit” (p. 128). In other words, a fearful person’s inability to suppress previous fearful reactions results in continuous avoidance behaviors, whereas anxiety is the product of the inability to detect the appropriate level of threat in an ambiguous situation, resulting in hyperarousal and rumination.

White and Depue’s (1999) research noted the two emotions having differing relationships to pupil dilation, suggesting that they are not interchangeable. Dien (1999) explored the differences between the two emotions by looking at how they functioned in the brains of trait fearful and trait anxious participants. They found that when participants completed an object-spatial recognition task, self-reported fear was associated with greater right-lateral blood flow in the front lobe, whereas self-reported anxiety was associated with greater left-lateral blood flow in the frontal lobes. Similarly, Morinaga et al. (2007) conducted a fear-inducing study where results showed that activity in the right prefrontal brain was correlated with self-reported fear, and not anxiety.

Davis and Shi (1999) also postulated that different areas of the extended amygdala, the region of the brain often associated with these emotions, are linked with fear versus anxiety. The authors found differences in two areas, the central nucleus of the amygdala (CeA) and the bed nucleus of the stria terminalis (BNST) when examining the reactions to fear-potentiated startle (fear) versus light-enhanced startle (anxiety) stimuli. These two structures respond to emotional signals, yet the authors suggest “that the BNST may be a system that responds to signals more akin to anxiety than those akin to fear, whereas the CeA is clearly involved in fear and perhaps not as

much in anxiety” (p. 288). This underscores the notion that even on a neurobiological level, the two emotions are in fact distinct from each other and should not be treated as equals.

So et al. (2016) stated, “the premise underlying this point is that fear and anxiety are discrete emotions with different core relational themes (i.e., causes) and action tendencies (i.e., behavioral implications) ... emotion theorists generally consider fear and anxiety to be discrete emotions with distinguishable appraisal patterns, motivational functions, and behavioral associations” (p. 124). In other words, different types of messages may trigger fear, anxiety, or both. This is a notable difference because fear and anxiety may influence the thoughts and behaviors of a person in different ways. The two emotions may serve different functions, affecting how a person responds to threatening messages.

For example, So et al.’s (2016) study revealed that the perceived severity of a message activates fear, whereas susceptibility activates anxiety. This is a demonstration of how manipulating a message can render different outcomes and may give insight as to why there have been inconsistencies in the measurement of fear. Past research has operationalized fear in a broad sense, and So et al.’s findings suggested that more precise outcomes can be measured if fear is broken down more specifically into fear and anxiety. I explore how the manipulation of the message frame and nature of the requested behavior influences both fear and anxiety when treated as separate emotions.

Control Processes

The differences between these emotions have important implications because fear and anxiety are responsible for different control processes outlined by Witte

(1992). The control processes she mentioned are those outlined by Leventhal's (1970) parallel process model: danger control and fear control. Leventhal argued that these two independent processes are the ways in which people react and respond to a threat. The fear control process is an emotional response to a threat, where the receiver is aiming to control the emotion, namely fear, elicited by the message. Many times, the fear control process is involuntary and can be dangerous because people are likely to deny or minimize the threat in attempts to quell their feelings of fear. At that point, the receiver is unable to process and accept the persuasive message (Shen & Dillard, 2014).

In contrast, the danger control process is a cognitive response to a threat. A receiver responding to a message in this way aims to address the danger and issue at hand. Shen and Dillard (2014) stated that messages are persuasive when danger control dominates a receiver's information processing, and that persuasion fails when the receiver is engaging in fear control processing. The danger control process results in more adaptive actions due to the elaboration of the message by the receiver (Witte, 1992).

Rogers' (1975) protection motivation theory (PMT) advanced and extended the notion of Leventhal's (1970) danger control process. Rogers' theory detailed the mechanisms of the danger control process by unpacking the components of a message and cognitive process through which it operates (Witte, 1992). The theory suggested four message components of a fear appeal that possibly lead an individual to engage in the danger control process: (1) the magnitude of the noxiousness of an event in an appeal; (2) the probability that the event will occur if no action is taken; (3) the effectiveness of the coping response presented in the message; and (4) the individual's

perception of whether they could effectively perform the coping response (Leventhal, 1970; Witte, 1992).

The magnitude of noxiousness leads to perceived severity, probability of occurring to perceived susceptibility, efficacy of coping response to perceived response efficacy, and individual ability to perceived self-efficacy. These components work as a cognitive mediation process that produces protection motivation, or a cognitive evaluation of the threat, which informs attitudes, intentions, and behaviors to take protective action and eliminate threat.

The highest level of persuasiveness and motivation to take protective action is achieved when all components are high. Thus, an individual is more likely to be persuaded to accept the message the more severe they believe the threat to be, the more susceptible they perceive themselves to be to the threat, the more effective they perceive the coping behavior to be, and the level of confidence they have in their ability to perform the coping behavior (Leventhal, 1970; Witte, 1992).

Rogers' (1983) extended the theory to include a coping appraisal process and threat appraisal process to address that issue. The coping appraisal process is an adaptive response, which contends that if response costs outweigh efficacy then an individual is more likely to engage in the maladaptive behaviors, whereas if efficacy outweighs response costs then they are more likely to engage in an adaptive behavior. Therefore, to encourage adaptive behavior a message should increase response/self-efficacy or decrease response costs. On the other hand, the threat appraisal process is a maladaptive response that occurs if the rewards of a dysfunctional behavior outweigh the severity or susceptibility to the danger. Accordingly, a message should

increase the severity and susceptibility to the danger, or decrease rewards of a dysfunctional behavior, to encourage adaptive behavior.

Witte (1992) noted that although protection motivation theory was satisfactory, it failed “to explain the specific factors that led to message rejection” (p. 337). She also pointed out that Rogers’ (1983) extended PMT does not explain how the two processes, coping appraisal and threat appraisal, work in tandem to influence behavior. Most notable, however, is the lack of attention to fear in the PMT model.

Rogers (1975) asserted that a change in attitude or behavior is not a result of fear, but rather the cognitive process in which an individual engages and level of protection motivation aroused. He indicated that fear can play a role in increasing the perceived severity of a message, thereby increasing protection motivation. Thus, fear has an indirect role in attitude and behavior change in this model.

In response to the lack of attention to fear and absent explanation of message rejection in fear appeal theories, Witte (1992) proposed the extended parallel process model (EPPM). This theory adopted Leventhal’s (1970) parallel process model but extended and elaborated on the fear control process. First, Witte asserted that there must be a high threat present in the message to instigate message processing. Without this high threat, there will not be a response, and the individual will not process the message. Therefore, a threat must be perceived as severe to garner attention and process the message. But, there is a critical point where if the threat exceeds perceived efficacy, the fear control process is activated and a boomerang effect is witnessed. In this way, a message with a level of fear that outweighs efficacy will render ineffective messaging.

Accordingly, Witte (1992) proposed that a message needs to offer a great level of efficacy. If perceived efficacy is low while threat is high, an individual will have a maladaptive response “to control the overwhelming fear stemming from a high perceived threat/low perceived efficacy situation...people either consciously or unconsciously deny the threat or react against the message” (p. 341). Thus, an effective message will have a severe threat paired with high efficacy. She summarized this notion by ultimately concluding that the level of efficacy determines the nature of a response, whether the fear control or the danger control process will prevail, and that the level of threat determines the intensity of a response.

Noting that fear is tied to the fear control process, and anxiety to the danger control process, understanding which of these emotions is elicited by a message is important. So et al. (2016) hypothesized that “anxiety generates greater motivation than does fear to obtain information about protective action,” which they postulated is due to anxiety’s attention towards uncertainty. This hypothesis was supported, showing that anxiety had a significantly stronger association with being motivated to gather protective information than did fear.

In an attempt to replicate this finding, I hypothesize the following:

I examine whether the manipulation of message frame elicits either fear or anxiety in the message receiver, and if there is an interaction with the messages’ requested behavior. This information could give practitioners insight of how to create more anxiety-provoking messages, as to more likely instigate the receiver’s danger control process.

RQ1: Will gain-framed messages induce greater feelings of anxiety or fear?

RQ2: Will loss-framed messages induce greater feelings of anxiety or fear?

RQ3: Will the results of research questions 1 and 2 be moderated by adoption or cessation?

Chapter 2

METHODOLOGY

The research outlined above informed a 2 x 2 x 4 experimental design. The independent variables include the message frame, requested behavior, and messages. Message frame includes two levels, gain-framed or loss-framed messages. Requested behavior also consists of two levels, adoption or cessation of a behavior. Messages has 4 levels, and each level has a different central topic that was manipulated by message frame and requested behavior. Combining the levels of all three variables will create 16 conditions, each of which were tested to measure any effects on the dependent variables. The three dependent variables include intention to perform an appropriate coping behavior, fear, and anxiety.

Pilot Study

A pilot study was conducted to pretest 11 initial messages that were created to be sure the amount of risk and threat present in the messages were equal across conditions. The 11 health topics included: tanning, illicit Adderall use, abusing painkillers, texting while driving, driving under the influence, skin cancer checks, wearing headphones while walking, looking down at phone while walking, not looking while crossing the street, STI check, and binge drinking. This was done to detect which messages were not fearful/threatening and significantly different in amount of fear/threat invoked. The pilot study ensured that any effects are due to the manipulation of the message frame and requested behavior, and not any extraneous variables.

Seventy-one male and female undergraduate students were recruited from Communication courses and awarded extra credit for their participation. The 55-

question pilot survey asked participants to rate the level of fear and risk they detect from each health message presented in the survey (see Appendix A). Each participant read the Adoption/Gain manipulation of each of the 11 health topic paragraphs and responded to a set of five questions assessing level of fear/threat following each message. The content for the message stimuli were collected from sources such as health magazine and websites, and relevant to the age of the participants. All messages were displayed in the same format, with the only differences being the topic. All message stimuli were roughly the same length (~100 words). The goal was to be sure that all of the messages pertaining to potentially risky health behaviors are equal in level of fear/risk, to avoid any confounding variables in the main survey.

Table 1:

Fear/Threat Levels by Message Topic

Means with the same letter are not significantly different.					
REGWQ Grouping			Mean	N	Paragraph
	A		27.692	52	DUI
	A				
B	A		25.673	52	Texting while driving
B	A				
B	A		25.423	52	Abusing painkillers
B	A				
B	A	C	24.481	52	STI check
B		C			
B		C	23.962	52	Binge drinking
B		C			
B		C	22.788	52	Skin cancer check
B		C			

B		C	22.423	52	Tanning
B		C			
B		C	22.038	52	Wearing headphones while walking
		C			
		C	21.692	52	Looking at phone while walking
		C			
		C	21.115	52	Illicit Adderall use
		C			
		C	21.077	52	Not looking while crossing the street

Results of the pilot study revealed which topics were the most similar in level of fear/threat and would be included in the main study (see Table 1). The 5 items on the scale were summed in a one-way ANOVA between sums for each of the 11 topic paragraphs. A one-way ANOVA revealed that 4 of the topics were above neutral in level of fear/threat and were not significantly different from each other. These 4 topics include: abusing painkillers, texting while driving, driving under the influence, and STI check. The other topics were below neutral and significantly different in level of fear/threat. Therefore, the main study only included manipulations of the above 4 health topics to ensure validity of independent variable.

Main Study Design

After conducting the pretest, the main study survey was designed (see Appendix B). Two hundred ninety-five male and female undergraduate students were recruited from Communication courses and awarded extra credit for their participation. To conduct the experiment, message stimuli were presented to

participants among the 16 conditions. All messages were displayed in the same format, with the only differences being the topic, whether the message is gain-framed, loss-framed, encouraging the adoption of a behavior or the cessation of a behavior. Each participant was assigned to one of the 16 conditions and exposed to the message stimulus for the assigned condition. After exposure to the message, each participant completed a survey, which comprised of the scales used to measure the dependent variables, as well as demographic questions.

I used the Champion Breast Cancer Fear Scale (CBCFS) constructed by Champion et al. (2004) to measure fear, adapting the items to reflect the topic presented in the respective condition rather than breast cancer. Additionally, I used Spielberger's (1983) state anxiety scale (Form Y-1) to measure anxiety. These scales were combined to form part of the survey. Because the two scales have unequal items, I used participants' average scores, instead of total sum, to compare fear and anxiety. I used a single item question to measure intention to perform an appropriate coping behavior. This question measured the intention to perform a healthy behavior regarding the topic presented to the participant. Each of the treatment conditions were tested to measure any possible effects on these dependent measures.

Ultimately, 4 different health-related topics manipulated according to the message frame or requested behavior assigned were tested. The pretest revealed which topics are most similar in level of threat and risk, from which I eliminated any topics that are significantly different. This ensured that any effects are due to the manipulation of the independent variables and not variance between the topics. Gaining as many topics as possible ensured that the difference in topic is not the reason for any differences measured in the dependent variable. These different topics

for the message stimuli each have four different manipulations of the message content and were tested in the experiment.

Analysis

The results of H1, H2, RQ1, and RQ2 were analyzed using a factorial analysis of variance (ANOVA), with Messages being treated as a random factor (see Jackson, 1992). The two treatment conditions for message frame were compared to see if any differences exist between them on intention to perform an appropriate coping behavior. Similarly, the two treatment conditions for type of requested behavior encouraged were compared to see if any differences exist between them on intention to perform an appropriate coping behavior. Because Messages are considered a random factor, the main effect for Frame used the Frame $\times$ Message interaction as the denominator of the *F*-test. Likewise, the main effect for Request employed the Request $\times$ Message interaction in the denominator of its test of significance (Jackson, 1992).

The different message topics were compared to see if any differences exist between each of the topics. Although minimal differences between the messages is ideal, the variable exists on a normal distribution and some differences are expected. However, results of the hypotheses and research questions should be unaffected by the messages, as the relationship between frame and requested behavior should not depend on the message topic being presented. To examine this assumption, the Frame $\times$ Message and Request $\times$ Message interaction was tested using traditional MS_{Error} .

Both R1 and R2 were tested in a factorial analysis of variance. The two treatment conditions for message frame were compared to see if differences exist on

two of the dependent variables, fear and anxiety. Furthermore, the two treatment conditions for type of requested behavior encouraged were compared to see if differences exist on the same two dependent variables, fear and anxiety.

Importance of Study

The results of this study have practical implications for the fields of public health and advertising. Understanding the recipe for effective persuasive messaging is essential for professionals creating these messages with the intent to improve the health and lives of others. Without a comprehension of how individuals process messages and are motivated to take protective action, effective message creation is no better than chance and is not making the best use of time and money. Although message frame, type of coping behavior, and emotions elicited by a message serve as only a small piece to understanding effective persuasive messages, their understanding is critical to the aggregation and advancement of knowledge in the realm of fear appeals.

Chapter 3

RESULTS

The results of all hypotheses and research questions were analyzed using a 2 (Request) x 2 (Frame) x 4 (Messages) ANOVA. The design was completely crossed. A manipulation check was included in the final questionnaire to assess the effectiveness of the manipulation for message frame and request. To measure these respectively, each condition included two questions, one asking if the message indicated the reader would gain or lose something, and one if the reader was told to do something or not do something.

Table 2:

Manipulation Check for Message Frame

Table of Frame by Perceived Frame			
Frame	Perceived Frame		
Frequency Percent Row Pct Col Pct	get something	lose something	Total
gain	43 16.10 34.68 40.57	81 30.34 65.32 50.31	124 46.44
loss	63 23.60 44.06 59.43	80 29.96 55.94 49.69	143 53.56
Total	106 39.70	161 60.30	267 100.00

Table 3:

Manipulation Check for Message Request

Table of Act Name by Perceived Act			
Act Name	Perceived Act		
Frequency Percent Row Pct Col Pct	Do Something	Not Do Somethi	Total
Adoption	80 29.96 57.55 60.61	59 22.10 42.45 43.70	139 52.06
Cessation	52 19.48 40.63 39.39	76 28.46 59.38 56.30	128 47.94
Total	132 49.44	135 50.56	267 100.00

Unfortunately, the manipulation check indicated the manipulation of message frame and request to be insufficient and weak. For message frame, 44.06% of participants did not respond as expected to the loss frame manipulation, and 65.32% did not respond to the gain frame (see Table 2). As for message request, 43.07% of participants did not respond to the adoption request in the expected manner, and 40.63% did not respond to the cessation request in accordance with the manipulation (see Table 3). Consequently, the lack of strength of the manipulation foreshadows a lack of findings in the following results. Without a strong manipulation, significant results are unlikely to be achieved.

However, both scales utilized in the main study questionnaire had high reliability. The Champion Breast Cancer Fear Scale (CBCFS) used to measure fear

had an alpha coefficient of 0.88. The State Anxiety Scale (Form Y-1) used to measure anxiety had an alpha coefficient of 0.83. This is no surprise as both scales have been widely used and tested. Therefore, any inconsistencies in the findings are not due to lack of accuracy in the scales to measure these dependent measures.

Table 4:

Message Impact on Fear

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	708.001512	47.200101	1.34	0.1776
Error	249	8759.341885	35.178080		
Corrected Total	264	9467.343396			

Source	DF	Type III SS	Mean Square	F Value	Pr > F
request	1	14.4642748	14.4642748	0.41	0.5220
frame	1	0.7874182	0.7874182	0.02	0.8812
request*frame	1	3.1420800	3.1420800	0.09	0.7653
message	3	563.5328634	187.8442878	5.34	0.0014
request*message	3	5.9313055	1.9771018	0.06	0.9824
frame*message	3	11.4341593	3.8113864	0.11	0.9552
request*frame*message	3	118.3513609	39.4504536	1.12	0.3409

Table 5:
Post Hoc Analysis of Fear by Messages

Means with the same letter are not significantly different.			
Duncan Grouping	Mean	N	Message
A	24.371	62	DUI
B	21.547	64	Texting while driving
B			
B	21.200	75	Abusing painkillers
B			
B	20.438	64	STI check

Regarding fear, one of the dependent measures, messages was the only significant factor $F(3, 249) = 5.34, p < .002, \eta^2 = .0198$ (see Table 4). Of the four message conditions, abusing painkillers, texting while driving, driving under the influence, and sexually transmitted infection check, only driving under the influence had a significant impact on fear. In other words, participants exposed to the DUI message reported significantly higher fear ($M = 24.37, SD = 5.97$) than those exposed to the other messages (see Table 5). Frame and request had no significant impact on level of fear. As for anxiety, no factors had a significant impact. Therefore, R1, R2, and R3 cannot be answered affirmatively.

Table 6:

Message Impact on Intention

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	26.0123207	1.7341547	1.51	0.1016
Error	249	285.8971133	1.1481812		
Corrected Total	264	311.9094340			

Source	DF	Type III SS	Mean Square	F Value	Pr > F
request	1	1.65546210	1.65546210	1.44	0.2310
frame	1	2.04177570	2.04177570	1.78	0.1836
request*frame	1	0.00022286	0.00022286	0.00	0.9889
message	3	14.23705501	4.74568500	4.13	0.0070
request*message	3	3.00883000	1.00294333	0.87	0.4554
frame*message	3	2.90022391	0.96674130	0.84	0.4720
request*frame*message	3	1.82901086	0.60967029	0.53	0.6614

Table 7:

Post Hoc Analysis of Intention by Messages

Means with the same letter are not significantly different.			
Duncan Grouping	Mean	N	Message
A	4.6774	62	DUI
A			
A	4.5867	75	Abusing painkillers
A			
A	4.5156	64	Texting while driving
B	4.0625	64	STI check

For intention to perform the behavior, message was again the only significant factor $F(3, 249) = 4.13, p < .01, \eta^2 = .0456$ (see Table 6). Of the four message conditions, sexually transmitted infection check was the only one that had a significant impact on intention. Namely, those who were exposed to the STI check condition reported that they intend to get checked for STIs more than ($M = 4.06, SD = 1.25$) participants intended to perform the respective behavior that they were exposed to (see Table 7). Although both H1 and H2 cannot be supported by the findings, knowledge of which messages have the most impact is of value.

Chapter 4

DISCUSSION

This study sought to understand more deeply the mechanism through which fear appeals operate in health messaging. Fear, a widely used tactic in advertising and marketing, is used to try and increase persuasiveness of a message and often attempts to garner behavior change (Tanner, Hunt, & Eppright, 1991). Therefore, a deeper examination of how to capitalize on any effects it may have is noteworthy. The aforementioned study specifically addressed whether a message's frame or request would make any impact on a consumer's level of fear, anxiety, or intention to perform a specific behavior. In other words, whether the message was gain-framed or loss-framed, and advocated to do something or to stop something, was studied for any effects.

The study initially included 11 different health messages, which after pilot testing were reduced to 4. These 4 topics (abusing painkillers, STI checks, texting while driving, DUI) were above neutral in amount of fear/risk they evoked and were not significantly different from each other in amount of fear/risk. This ensured that any and all effects would be a result of the manipulation and not difference in messages. Each topic was manipulated by message frame and request, creating a 2 x 2 x 4 experiment. The hypotheses were not supported and the research questions could not be answered affirmatively. An unsuccessful manipulation was the clear reason for lack of supportive results.

As previously stated, each topic was manipulated four ways according to message request and frame, including adoption/gain, adoption/loss, cessation/gain, or cessation/loss. After each paragraph was displayed in the survey, a question asking

the participant if the above statement was telling them to do something or not do something, and if it seemed to be explaining they would get something or lose something, to test if the manipulation was recognized. The analysis of the manipulation check questions showed that the manipulation was not recognized. Therefore, the lack of findings came as no surprise. If the participant could not even perceive that there were differences in messages, different results between messages cannot be expected. Replication of the study should be sure to have a strong manipulation and checked for effectiveness prior to main data collection.

However, there were interesting results regarding the messages factor. One message topic, DUI, scored higher on fear, demonstrating that participants exposed to this message felt higher levels of fear than participants exposed to the other message topics. This finding implicates that driving under the influence proves more a threat to the population of participants that completed the survey. The population was made up of undergraduate college students, and driving under the influence creates more serious consequences that instills fear within the participant.

With the ubiquity of ride-sharing platforms such as Uber and Lyft, finding the DUI message to be the most fearful was surprising. The pervasiveness of substance abuse programs that exist in schools and anti-drinking and driving commercials could be of explanation of this. Public health messages targeted toward college students/young adults should be less focused on the topic of DUI, as it already strikes a nerve with this population. A more tactful use of time and money can be spent trying to increase fear in this population of other threatening health issues.

Similarly, a different message topic, STI check, resulted in higher scores of intention than the other topics. Hence, participants exposed to the STI check message

had greater intentions to get checked for STIs than did participants regarding of the other topics they were shown. This could be explained by the many resources available to this population to facilitate their ability to get screened. Most college campuses provide free STI screenings, so it is not surprising that students feel they are able to get screened, a strong predictor of intention (Fishbein & Ajzen, 1975). Further research should explore what barriers prevent this population from performing other healthy behaviors, and health messaging should then focus on promoting those behaviors.

Limitations

There is always room for improvement when assessing empirical studies, and this experiment is no exception. The biggest limitation was the unsuccessful manipulation. Again, the messages must be created with a stronger manipulation and tested before the main study. Secondly, the message content is not completely accurate from a public health standpoint. Precisely, the messages make blanket statements and were exaggerated for the purpose of this study. Although this was done to strengthen the manipulation, the falseness of the statements should be noted.

A substantial limitation that was recognized from the inception of the study were the measurement tools. Self-report questionnaires in general are subject to individual inaccuracies, and probably even more when they ask to describe and reflect on emotions. The two emotions measured in this study, fear and anxiety, are very closely related, and distinguishing between the two in a self-report questionnaire could have been difficult for the participant. Some individuals are also better at recognizing and expressing emotion than others, which could have also played a role in the results of this study.

Future Research

Future research should replicate the study with more advanced and accurate measurement tools, rather than self-report. Although costly and time consuming, physiological measures, such as heart rate, galvanic skin response, pupil dilation, fMRI, etc. should be utilized to more accurately capture which emotion was active while the participant read the message stimuli. Therefore, comparing which messages elicited more anxiety than fear could be identified. This would help understand the neurological bases in which fear and anxiety operate, especially in response to health messaging.

Another area that future research should explore is the medium by which the messages were communicated. The current study used a short, written text to explain the health topic and its consequences. Although text can be threatening, images and sound effectively evoke emotion and may do a better job at garnering high levels of fear and anxiety. Short commercial-like videos or images could be included in the study as the message stimuli in place of the written paragraphs. Within that, they could be portrayed more factually in a public service announcement format, or more emotionally in a narrative format. Noticing any differences between format and tone of the messages would be interesting.

Similarly, examining individual differences would be a noteworthy direction for future research. It would be interesting to observe if an individual's tendency to process stimuli centrally, prioritizing fact and logic, or peripherally, attending primarily to emotion and feeling, has any effect on the outcome measures. This could help inform how health messaging should be designed to evoke the greatest fear, anxiety, and intention for industry use.

Other individual differences that should be considered is personal experience and age. The topics selected for the current study were relevant and salient to the population being studied. Many of the participants could have personally been affected by consequences of the topics mentioned, thus possibly affecting their responses. Asking if the participant has had any significant experiences with the health message topic may help better understand responses, and see what affects that could have. If the study is replicated, the health topics tested to be included in the main study should be relevant to whatever the age of the population being studied. It would be interesting to notice differences in effects between different age groups, namely if older age ranges feel greater anxiety and have greater levels of intention to perform the healthy/requested behavior.

CONCLUSION

Whether we consciously notice it or not, the media around us are constantly persuading and influencing its consumers. Within the messages surrounding us lies a tactic, fear, long used to frighten us into taking (or not taking) some sort of action, particularly in regard to health behaviors (Tanner, Hunt, & Eppright, 1991). The way these messages are framed, and what they ask individuals to do, can affect the way they are perceived and understood (Nabi, 2003). The mixed definitions of fear, and lack of differentiating from its closely-related counterpart, anxiety, has yielded mixed and inconsistent findings in the fear appeal literature (Witte, 1992).

The present study aimed to understand whether a gain-frame or loss-frame, and whether a message advocated to do a behavior or stop a behavior, had any effects on an individual's level of fear, anxiety, and intention to perform the healthy behavior. The purpose was to see what type of message manipulation could elicit more anxiety than fear, because it acts as a stronger motivator to healthy behavior change, and to also clear up the mixed definitions in the literature (Witte, 1992).

Unfortunately, the study did not yield generate significant findings in respect to its hypotheses and research questions. However, results did uncover which topic elicited the most fear in the participants, and which topic aroused the most intention in the participants, offering useful insight to public health and marketing practitioners. Fear appeals have proved to be a difficult subject to comprehend and conceptualize. With more precise measurements and manipulation methods, it could be better understood and used as an impactful tool with practical implications in the field of health communication and many more.

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Appendix A

PILOT STUDY SURVEY

Start of Block: Intro

Please read the following paragraphs carefully and rate them on the scales that follow.

(Each participant is randomly shown 1 of the following 11 paragraphs):

End of Block: Intro

Start of Block: Tanning

Q1 One person dies of melanoma every hour, and more people are diagnosed with skin cancer each year in the U.S. than all other cancers combined. Although when detected early the 5-year survival rate is 99%, it falls to only 20% when the disease metastasizes to distant organs. The vast majority of melanomas are caused by the sun. In fact, one UK study found that about 86% of melanomas can be attributed to exposure to ultraviolet (UV) radiation from the sun. Research shows that regular daily use of an SPF 15 or higher sunscreen reduces the risk of developing melanoma by about 40%. Wear sunscreen before sun exposure so you can protect yourself from being another death caused by skin cancer.

End of Block: Tanning

Start of Block: Illicit Adderall use

Q2 Amphetamines such as Adderall can have serious long-term side effects in those not diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). Some of these side effects include, but are not limited to: hair loss, sexual dysfunction, irregular heartbeat, numbness, unexplained wounds, and other circulatory problems. 1 in 3 adults reported the development of psychological disorders such as Major Depressive Disorder and Generalized Anxiety after long-term use of the drug. Only take Adderall if you are prescribed it, and in the recommended dose for your disorder, and you can avoid the long-term negative effects of the drug.

End of Block: Illicit Adderall use

Start of Block: Abusing painkillers

Q3 Every day, more than 115 people in the United States die after overdosing on opioids. The rising number of opioid deaths is attributed to the increase in distribution of prescription opioids. Once addicted, it can be nearly impossible to stop. In 2017, more than 11.5 million Americans reported misusing prescription opioids in the past year, and about 80% of people who use heroin first misused prescription opioids. Only take prescription opioids if you have been prescribed them, and in the recommended dose, and you can avoid falling victim to addiction.

End of Block: Abusing painkillers

Start of Block: Texting and driving

Q4 Because it's a common – even daily – activity for most people, sending a text doesn't seem dangerous. However, 64% of all road accidents in the U.S. have cell phones involved in them. The chances of a crash because of any reason is increased by 23 times when you are texting. Texting and driving threatens every single driver around you, placing more value on that text than yourself and other drivers. Put your phone on do not disturb and pay attention while driving to avoid preventable accidents, and from injuring yourself and other innocent drivers.

End of Block: Texting and driving

Start of Block: Driving under the influence

Q5 Every 51 minutes in America, someone is killed in a drunk driving crash. That equates to 27 people every day. Alcohol is not the only substance responsible for accidents caused by impaired driving. In 2017, of those tested, 1 in 3 drivers killed in car crashes tested positive for drugs. Those who drive under the influence of marijuana are 65% more likely to get in a car crash than those who don't. Drive sober, or when in doubt call for a ride. This way, you can avoid ruining your future with a DUI, or getting in an accident, injuring yourself and innocent others.

End of Block: Driving under the influence

Start of Block: Skin cancer check

Q6

One in five Americans will develop skin cancer by the age of 70. Only 20-30% of melanomas are found in existing moles, while 70 to 80% arise on apparently normal skin. Most skin cancer deaths could have been prevented with early detection and treatment. Self-exams and full-body exams done by a dermatologist are the easiest ways to check your skin for any possible indicators of cancerous moles. See a dermatologist for a full-body exam and check your skin for suspicious moles, and you can catch signs of skin cancer early enough to avoid being the one person that dies from skin cancer every hour.

End of Block: Skin cancer check

Start of Block: Wearing headphones while walking

Q7 3 out of 5 young people walk along streets with headphones in despite the fact they know it is a safety concern. You can see what is in front of you but you can't hear what is coming up to you from behind or off to your side. An officer from the New Castle County Police Department stated that there were a number of attempted assaults on joggers throughout the county, and in every case the victim of the attempted assault was wearing headphones and did not hear the assailant coming. Wearing anything that cuts down on your ability to hear danger and then adding loud music to mask most surrounding sounds is a recipe for disaster. Walk and run without headphones so you can avoid being an easy target for assault.

End of Block: Wearing headphones while walking

Start of Block: Looking at phone while walking

Q8 A study published in the American Journal of Public Health found that between 2011 and 2016, 116 pedestrians wearing headphones died or were injured in the U.S. in accidents involving cars or trains they didn't hear or see coming. Half of the victims were struck by trains; the other half by cars, buses, trucks, tractor trailers or bicycles. A man wearing headphones was struck and killed by an Amtrak train in Baltimore in February 2014 because he was not looking. Another study in the U.S. showed that the number of people being admitted to hospital emergency rooms because of walking while on the phone had risen

dramatically – from 256 in 2010 to 1,506 in 2015. Walk attentively without using your phone and you can avoid being injured by preventable accidents.

End of Block: Looking at phone while walking

Start of Block: Not looking while crossing the street

Q9 The deaths of pedestrians have risen over the last few years. In 2016, a study by the National Highway Traffic Safety Administration showcased that 4,109 deaths have taken place and more than 69,000 people in that year were injured alone. More recently, according to a Governors Highway Safety Association report, there were nearly 6,000 pedestrian fatalities in 2017. Although pedestrians have the right of way, awareness and vigilance can prevent accidents from occurring. When walking to cross the street, pay attention and look both ways and you can avoid unnecessary accidents.

End of Block: Not looking while crossing the street

Start of Block: STD check

Q10 Less than half of adults age 18 to 44 have ever been tested for an STD. Untreated STDs can have serious health consequences. STDs can cause pelvic inflammatory disease (PID), cervical cancer, liver disease, and infertility. Those such as syphilis and HIV/AIDS can be fatal in both men and women. By the time women notice symptoms or see a doctor, complications from an untreated infection may already have jeopardized their health. The CDC estimates that 2.8 million new cases of the most common STD, chlamydia, are contracted each year, with most going undetected. Even if you don't notice symptoms, get screened for STDs so you can receive treatment before the serious consequences occur and can avoid infecting others.

End of Block: STD check

Start of Block: Binge drinking

Q11 Most students do not go out and expect to wake up to one of their friends being dead. The sad reality is that more than 1,800 students die every year of alcohol-related causes, mostly due to alcohol poisoning from drinking too much and not being treated. An additional 600,000 are injured while drunk, and nearly 100,000 become victims of alcohol-influenced sexual assaults. 1 in 4 say their academic performance has suffered from drinking, all according to the National Institute on Alcohol Abuse and Alcoholism. Alcohol increases your chances of making poor decisions that can have serious consequences you regret when

sober. Know your limits when drinking and you can avoid negative consequences such as poor academic performance, injury, and death.

(Participant then responds to the following scale, in regards to the single paragraph they were randomly assigned to)

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not very fearful	☐	☐	☐	☐	☐	☐	☐	Very fearful
Very risky	☐	☐	☐	☐	☐	☐	☐	Not very risky
Not very threatening	☐	☐	☐	☐	☐	☐	☐	Very threatening
Very alarming	☐	☐	☐	☐	☐	☐	☐	Not very alarming
Not very hazardous	☐	☐	☐	☐	☐	☐	☐	Very hazardous

End of Block: Binge drinking

Start of Block: ID

Q20 Please enter your student ID number.

End of Block: ID

Appendix B
MAIN STUDY SURVEY

Start of Block: Intro

Q1

Please read the following paragraph carefully.

End of Block: Intro

Start of Block: Painkillers A/G

Q2 Every day, more than 115 people in the United States die after overdosing on opioids. The rising number of opioid deaths is attributed to the increase in distribution of prescription opioids. Once addicted, it can be nearly impossible to stop. In 2017, more than 11.5 million Americans reported misusing prescription opioids in the past year, and about 80% of people who use heroin first misused prescription opioids. Only take prescription opioids if you have been prescribed them, and in the recommended dose, and you can avoid falling victim to addiction.

Appendix

Q3

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to misuse painkillers (1)	☐	☐	☐	☐	☐

End of Block: Painkillers A/G

Start of Block: Painkillers C/G

Q4 Every day, more than 115 people in the United States die after overdosing on opioids. The rising number of opioid deaths is attributed to the increase in distribution of prescription opioids. Once addicted, it can be nearly impossible to stop. In 2017, more than 11.5 million Americans reported misusing prescription opioids in the past year, and about 80% of people who use heroin first misused prescription opioids. Do not abuse prescription opioids or take them without a prescription, and you can avoid falling victim to addiction.

Appendix

Q5

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to misuse painkillers (1)	☐	☐	☐	☐	☐

End of Block: Painkillers C/G

Start of Block: Painkillers A/L

Q6 Every day, more than 115 people in the United States die after overdosing on opioids. The rising number of opioid deaths is attributed to the increase in distribution of prescription opioids. Once addicted, it can be nearly impossible to stop. In 2017, more than 11.5 million Americans reported misusing prescription opioids in the past year, and about 80% of people who use heroin first misused prescription opioids. Only take prescription opioids if you have been prescribed them, and in the recommended dose, or you will likely fall victim to addiction.

Appendix

Q7

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to misuse painkillers (1)	☐	☐	☐	☐	☐

End of Block: Painkillers A/L

Start of Block: Painkillers C/L

Q8 Every day, more than 115 people in the United States die after overdosing on opioids. The rising number of opioid deaths is attributed to the increase in distribution of prescription opioids. Once addicted, it can be nearly impossible to stop. In 2017, more than 11.5 million Americans reported misusing prescription opioids in the past year, and about 80% of people who use heroin first misused prescription opioids. Do not abuse prescription opioids or take them without a prescription, or you will likely fall victim to addiction.

Appendix

Q9

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to misuse painkillers (1)	☐	☐	☐	☐	☐

End of Block: Painkillers C/L

Start of Block: Texting A/G

Q10 Because it's a common – even daily – activity for most people, sending a text doesn't seem dangerous. However, 64% of all road accidents in the U.S. have cell phones involved in them. The chances of a crash because of any reason is increased by 23 times when you are texting. Texting and driving threatens every single driver around you, placing more value on that text than yourself and other drivers. Put your phone on do not disturb and pay attention while driving to avoid preventable accidents, and from injuring yourself and other innocent drivers.

Appendix

Q11

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to text while driving (1)	☐	☐	☐	☐	☐

End of Block: Texting A/G

Start of Block: Texting C/G

Q12 Because it's a common – even daily – activity for most people, sending a text doesn't seem dangerous. However, 64% of all road accidents in the U.S. have cell phones involved in them. The chances of a crash because of any reason is increased by 23 times when you are texting. Texting and driving threatens every single driver around you, placing more value on that text than yourself and other drivers. Don't text, look at, or use your phone while driving to avoid preventable accidents, and from injuring yourself and other innocent drivers.

Appendix

Q13

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to text while driving (1)	☐	☐	☐	☐	☐

End of Block: Texting C/G

Start of Block: Texting A/L

Q14 Because it's a common – even daily – activity for most people, sending a text doesn't seem dangerous. However, 64% of all road accidents in the U.S. have cell phones involved in them. The chances of a crash because of any reason is increased by 23 times when you are texting. Texting and driving threatens every single driver around you, placing more value on that text than yourself and other drivers. Put your phone on do not disturb and pay attention while driving or you will likely be the cause of the 1 in 4 accidents caused by texting and driving, injuring yourself and other innocent drivers.

Appendix

Q15

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to text while driving (1)	☐	☐	☐	☐	☐

End of Block: Texting A/L

Start of Block: Texting C/L

Q16 Because it's a common – even daily – activity for most people, sending a text doesn't seem dangerous. However, 64% of all road accidents in the U.S. have cell phones involved in them. The chances of a crash because of any reason is increased by 23 times when you are texting. Texting and driving threatens every single driver around you, placing more value on that text than yourself and other drivers. Don't text, look at, or use your phone while driving or you will likely be the cause of the 1 in 4 accidents caused by texting and driving, injuring yourself and other innocent drivers.

Appendix

Q17

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to text while driving (1)	☐	☐	☐	☐	☐

End of Block: Texting C/L

Start of Block: DUI A/G

Q18 Every 51 minutes in America, someone is killed in a drunk driving crash. That equates to 27 people every day. Alcohol is not the only substance responsible for accidents caused by impaired driving. In 2017, of those tested, 1 in 3 drivers killed in car crashes tested positive for drugs. Those who drive under the influence of marijuana are 65% more likely to get in a car crash than those who don't. Drive sober, or when in doubt call for a ride. This way, you can avoid ruining your future with a DUI, or getting in an accident, injuring yourself and innocent others.

Appendix

Q19

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to drive under the influence (1)	☐	☐	☐	☐	☐

End of Block: DUI A/G

Start of Block: DUI C/G

Q40 Every 51 minutes in America, someone is killed in a drunk driving crash. That equates to 27 people every day. Alcohol is not the only substance responsible for accidents caused by impaired driving. In 2017, of those tested, 1 in 3 drivers killed in car crashes tested positive for drugs. Those who drive under the influence of marijuana are 65% more likely to get in a car crash than those who don't. Don't drive under the influence of any substance, or assume you are fine to drive. This way, you can avoid ruining your future with a DUI, or getting in an accident, injuring yourself and innocent others.

Appendix

Q41

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to drive under the influence (1)	☐	☐	☐	☐	☐

End of Block: DUI C/G

Start of Block: DUI A/L

Q20 Every 51 minutes in America, someone is killed in a drunk driving crash. That equates to 27 people every day. Alcohol is not the only substance responsible for accidents caused by impaired driving. In 2017, of those tested, 1 in 3 drivers killed in car crashes tested positive for drugs. Those who drive under the influence of marijuana are 65% more likely to get in a car crash than those who don't. Drive sober, or when in doubt call for a ride. Otherwise, you are likely to ruin your future with a DUI or get in an accident, injuring yourself and innocent others.

Appendix

Q21

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to drive under the influence (1)	☐	☐	☐	☐	☐

End of Block: DUI A/L

Start of Block: DUI C/L

Q22 Every 51 minutes in America, someone is killed in a drunk driving crash. That equates to 27 people every day. Alcohol is not the only substance responsible for accidents caused by impaired driving. In 2017, of those tested, 1 in 3 drivers killed in car crashes tested positive for drugs. Those who drive under the influence of marijuana are 65% more likely to get in a car crash than those who don't. Don't drive under the influence of any substance, or assume you are fine to drive. Otherwise, you are likely to ruin your future with a DUI or get in an accident, injuring yourself and innocent others.

Appendix

Q23

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend not to drive under the influence (1)	☐	☐	☐	☐	☐

End of Block: DUI C/L

Start of Block: STD A/G

Q24 Less than half of adults age 18 to 44 have ever been tested for an STD. Untreated STDs can have serious health consequences. STDs can cause pelvic inflammatory disease (PID), cervical cancer, liver disease, and infertility. Those such as syphilis and HIV/AIDS can be fatal in both men and women. By the time women notice symptoms or see a doctor, complications from an untreated infection may already have jeopardized their health. The CDC estimates that 2.8 million new cases of the most common STD, chlamydia, are contracted each year, with most going undetected. Even if you don't notice symptoms, get screened for STDs so you can

receive treatment before the serious consequences occur and can avoid infecting others.

Appendix

Q25

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend to get screened for STIs (1)	☐	☐	☐	☐	☐

End of Block: STD A/G

Start of Block: STD C/G

Q26 Less than half of adults age 18 to 44 have ever been tested for an STD. Untreated STDs can have serious health consequences. STDs can cause pelvic inflammatory disease (PID), cervical cancer, liver disease, and infertility. Those such as syphilis and HIV/AIDS can be fatal in both men and women. By the time women notice symptoms or see a doctor, complications from an untreated infection may already have jeopardized their health. The CDC estimates that 2.8 million new cases of the most common STD, chlamydia, are contracted each year, with most going undetected. Even if you don't notice symptoms, don't assume you are free of infection so you can receive treatment before the serious consequences occur and avoid infecting others.

Appendix

Q27

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend to get screened for STIs (1)	☐	☐	☐	☐	☐

End of Block: STD C/G

Start of Block: STD A/L

Q28 Less than half of adults age 18 to 44 have ever been tested for an STD. Untreated STDs can have serious health consequences. STDs can cause pelvic inflammatory disease (PID), cervical cancer, liver disease, and infertility. Those such as syphilis and HIV/AIDS can be fatal in both men and women. By the time women notice symptoms or see a doctor, complications from an untreated infection may already have jeopardized their health. The CDC estimates that 2.8 million new cases of the most common STD, chlamydia, are contracted each year, with most going undetected. Even if you don't notice symptoms, get screened for STDs or you will not be able to receive treatment before the serious consequences occur and will infect others.

Appendix

Q29

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend to get screened for STIs (1)	☐	☐	☐	☐	☐

End of Block: STD A/L

Start of Block: STD C/L

Q30 Less than half of adults age 18 to 44 have ever been tested for an STD. Untreated STDs can have serious health consequences. STDs can cause pelvic inflammatory disease (PID), cervical cancer, liver disease, and infertility. Those such as syphilis and HIV/AIDS can be fatal in both men and women. By the time women notice symptoms or see a doctor, complications from an untreated infection may already have jeopardized their health. The CDC estimates that 2.8 million new cases of the most common STD, chlamydia, are contracted each year, with most going undetected. Even if you don't notice symptoms, don't assume you are free of infection or you will not be able to receive treatment before the serious consequences occur and will infect others.

Appendix

Q31

Rate your level of agreement with the following statement:

	Strongly disagree (8)	Somewhat disagree (9)	Neither agree nor disagree (10)	Somewhat agree (11)	Strongly agree (12)
I intend to get screened for STIs (1)	☐	☐	☐	☐	☐

End of Block: STD C/L

Start of Block: Questionnaire

Q32 The topic in the previous paragraph makes me feel:

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
Scared (1)	☐	☐	☐	☐	☐
Nervous (2)	☐	☐	☐	☐	☐
Upset (3)	☐	☐	☐	☐	☐
Depressed (4)	☐	☐	☐	☐	☐
Jittery (5)	☐	☐	☐	☐	☐
Heart beats faster (6)	☐	☐	☐	☐	☐
Uneasy (7)	☐	☐	☐	☐	☐

Q33 Indicate how you feel right now, at this moment:

	Not at all (1)	Somewhat (2)	Moderately so (3)	Very much so (4)
I feel calm (1)	☐	☐	☐	☐
I feel secure (2)	☐	☐	☐	☐
I am tense (3)	☐	☐	☐	☐
I feel strained (4)	☐	☐	☐	☐
I feel at ease (5)	☐	☐	☐	☐
I feel upset (6)	☐	☐	☐	☐
I am presently worrying over possible misfortunes (7)	☐	☐	☐	☐
I feel satisfied (8)	☐	☐	☐	☐
I feel frightened (9)	☐	☐	☐	☐
I feel comfortable (10)	☐	☐	☐	☐
I feel self-confident (11)	☐	☐	☐	☐
I feel nervous (12)	☐	☐	☐	☐
I am jittery (13)	☐	☐	☐	☐
I feel indecisive (14)	☐	☐	☐	☐

I am relaxed (15)	☐	☐	☐	☐
I feel content (16)	☐	☐	☐	☐
I am worried (17)	☐	☐	☐	☐
I feel confused (18)	☐	☐	☐	☐
I feel steady (19)	☐	☐	☐	☐
I feel pleasant (20)	☐	☐	☐	☐

End of Block: Questionnaire

Start of Block: Demographics

Q34 What is your age?

- ☐ Under 18 (1)
- ☐ 18 - 24 (2)
- ☐ 25 - 34 (3)
- ☐ 35 - 44 (4)
- ☐ 45 - 54 (5)
- ☐ 55 - 64 (6)
- ☐ 65 or older (7)

Appendix

Q35 What is your gender?

- ☐ Male (1)
- ☐ Female (2)
- ☐ Other (3) _____

Appendix

Q36 Please specify your ethnicity.

- ☐ White (1)
- ☐ Hispanic or Latino (2)
- ☐ Black or African American (3)
- ☐ American Indian or Alaska Native (4)
- ☐ Asian (5)
- ☐ Native Hawaiian or Pacific Islander (6)
- ☐ Other (7) _____

Appendix

Q37 What is your class year?

- ☐ Freshman (1)
- ☐ Sophomore (2)
- ☐ Junior (3)
- ☐ Senior (4)
- ☐ Other (5)

End of Block: Demographics

Appendix C
PILOT STUDY IRB APPROVAL



RESEARCH OFFICE

210 Hullihen Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: October 4, 2018

TO: Jaquelyn Lucchesi
FROM: University of Delaware IRB

STUDY TITLE: [1313187-1] Thesis

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: October 4, 2018

REVIEW CATEGORY: Exemption category # (2)

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.

Appendix D
MAIN STUDY IRB APPROVAL



RESEARCH OFFICE

210 Hullihen Hall
University of Delaware
Newark, Delaware 19716-1551
Ph: 302/831-2136
Fax: 302/831-2828

DATE: November 21, 2018

TO: Jaquelyn Lucchesi
FROM: University of Delaware IRB

STUDY TITLE: [1347350-1] Thesis Main Study

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: November 21, 2018

REVIEW CATEGORY: Exemption category # (2)

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Renee Stewart at (302) 831-2137 or stewartr@udel.edu. Please include your study title and reference number in all correspondence with this office.