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FEAR VS. HOPE: DO DISCRETE EMOTIONS MEDIATE MESSAGE FRAME
EFFECTIVENESS IN GENETIC CANCER SCREENING APPEALS?

by

MATTHEW SONES

Under the Direction of Cynthia Hoffner, PhD

ABSTRACT

New advances in genetic screening now make it possible to determine if a person is more susceptible to certain types of cancer. In some cases, it may be advisable to promote consultations with health care providers for genetic cancer screening among patients at risk for cancer. Using emotional appeals is one way to promote genetic cancer screening. The primary purpose of this study was to examine the role of the emotions of fear and hope in mediating the influence of emotion-framed PSAs. This study explored the relative effectiveness of a fear-framed video message and a hope-framed video message at influencing people's attitudes toward genetic cancer screening and in persuading individuals at increased risk for cancer to talk to their doctors about genetic cancer screening. This study examined three different models of

mediation: a model testing the mediation of framing effect on behavioral intent by attitude, a model testing the mediation of framing effect on attitude by both fear and hope, and a model testing the mediation of framing effect on behavioral intent by fear and hope. Overall, the fear-framed and hope-framed PSAs did not differ from a control group in terms of attitude toward genetic cancer screening, but both PSAs lead to greater intent to discuss genetic cancer screening with a health care provider (compared to the control group). Message frame had no significant indirect effect on behavioral intent through attitude toward genetic cancer screening. Likewise, message frame had no significant indirect effect on attitude toward genetic cancer screening through hope or fear. The study did find evidence that both discrete emotions mediated the effectiveness of message frame on intent to discuss genetic cancer screening with a health care provider, which was the health behavior targeted by the messages. These findings suggest that both hope and fear essentially transferred the effect of message frame onto behavioral intent and that both hope and fear were effective mediators of the framing effect.

INDEX WORDS: Message framing, Positive emotions, Hope, Fear, Genetic cancer screening, Persuasion.

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MATTHEW SONES

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

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Georgia State University

2017

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Matthew Curtis Sones
2017

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May 2017

DEDICATION

Dedicated to my wife for her unwavering support and my kids who encouraged me to never give up all those *many* times when I felt like giving up.

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A special thanks to Dr. Cynthia Hoffner for serving as my committee chair on this project and for guiding me through this 12-year odyssey! To Dr. Jay M. Bernhardt, Dr. Holley Wilkin, and Dr. Gregory Lisby for teaching me so much on this journey.

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1 INTRODUCTION

1.1 Purpose of the Study

A recent billboard sign for an Atlanta cancer center read “Where fear meets hope.” When dealing with cancer perhaps no two emotions come to mind more than fear and hope. It is certainly reasonable to expect that a diagnosis of cancer can be a frightening experience fraught with fear and uncertainty as well as hope of becoming a cancer survivor.

But people can also be afraid *of* cancer too. One recent survey in Great Britain indicated that cancer was the number one health fear (*The Scotsman*, 2010). Perhaps too, people with a greater family history of cancer may be more fearful of their chances of getting cancer, especially if they know that cancer “runs in the family” so to speak. For them, the prospect of learning that they may be more at risk for cancer than those with no family history through genetic testing can also be frightening. Individuals in this situation, however, may also experience hope if their knowledge can lead to actions that can help prevent cancer and ultimately lead a healthier life.

For those with a family history of cancer, there are clinically viable genetic screening options available that can detect whether or not an individual possesses a genetic predisposition for certain types of cancer such as breast, cervical, colorectal, and thyroid (Robson, Storm, Weitzel, Wollins, & Offit, 2010). According to the American Cancer Society there were nearly 420,000 new cases of the aforementioned cancers diagnosed in 2013 and nearly 80,000 deaths (American Cancer Society, 2013a). Moyer (2014), on behalf of the U.S. Preventive Services Task Force, points out that genetic screening for these types of cancers in certain individuals can be beneficial and lead to interventions that may reduce risk for cancer or cancer-related death. The American Cancer Society suggests that individuals who are concerned about their family history of cancer should talk to their doctors about the possibility of genetic screening for cancer (American Cancer Society, 2013b). Because of the potential benefits of genetic screening, it can be argued therefore that individuals with a potential genetic pre-disposition to cancer should discuss the possibility of genetic testing with their doctors. This does not imply that

everyone with such concerns should undergo genetic testing, merely that they should consult with a physician about it.

It could also be argued that appeals for genetic screening consultations should be therefore developed and directed at individuals who may be considered at high risk for certain cancers. Should individuals with a family history of cancer be scared into talking to their doctors about the possibility of genetic testing or should so-called positive emotions such as hope be used to motivate such consultations? The role of these emotions in mediating the relationship between frame and attitude toward genetic cancer screening appeals will be examined in this paper.

Political pollster Frank Luntz pointed out that “it’s not what you say but how you say it” (Luntz, 2007). The underlying implication is that the effect of messages is not a function of content differences but in the modes of presentation (Scheufele & Tewksbury, 2007). The same message content can be presented or “framed” in different ways which is thought to influence how people hear and respond to these messages. To frame, according to Entman (1993) is to “select some aspect of a perceived reality and make it more salient in communicating a text” (p. 52).

For example, a message designed to promote colon cancer screening can be presented in a way that tries to “scare” people into getting a colonoscopy. The message could do this by making salient the idea that they could be very sick with colon cancer and not know it and may even die sooner because of it. In other words, it makes salient the “bad things” that could happen if a person does not get screened. This message makes it clear what those bad things are: They may be dying and not even know it. This would be called a loss frame in that it shows the consequences or “losses” the person could incur if they don’t get screened.

The same message can be presented in such a way that makes more salient the positive aspects, or the “good things” that could happen if you get screened: Getting screened can catch cancer earlier so that it can be more effectively treated and increase the chance for survival. This would be an example of a “gain” frame such that it demonstrates the good things that could happen as a result of adopting the

screening behavior. The vast difference between the two messages is nicely illustrative of the point made by Frank Luntz (2007) that the same appeals can be framed in very different ways.

Health messages have long used these types of gain or loss framed appeals to try to influence people. As the previous example illustrates, how a message is framed can influence emotional responses. A great many health messages have used different frames to elicit different emotions. Many messages do utilize appeals designed to elicit so-called negative emotions, notably fear, to motivate action. Recent and not so recent history is replete with examples of health messages designed to scare people so that they would either avoid a certain behavior that was thought to be harmful to them (smoking for example) or to adopt a behavior thought to be beneficial to them (wearing a seatbelt). In general, these types of messages are called “fear appeals.” According to a recent meta-analysis of over 130 fear appeals studies, fear appeals are effective, especially for promoting one time behaviors and detection behaviors (Tannebaum, 2013).

Clearly there has been much interest in fear appeals in the literature. It cannot not, however, be assumed that fear is *always* the best way to change someone’s attitude toward a health behavior. As indicated above, the elicitation of fear may be more effective in certain situations (Tannebaum, 2013) implying that other emotions may be as or more effective in other situations. One could easily frame a genetic cancer screening appeal as loss-framed message eliciting fear or as a gain-framed message eliciting a positive emotion such as hope. Which message would be more effective, however, remains unclear at this point as does the role of the discrete emotion in the relationship between message frame and attitude toward a health behavior. This information would be of value to individuals designing health appeals.

In this study, I will first examine the relative effectiveness of fear and hope in genetic cancer screening appeals and the extent to which these discrete emotions mediate the influence of message frame on attitudes toward genetic cancer screening and intent to seek counsel about screening from a health care provider.

2 LITERATURE REVIEW

2.1 Framing theory

According to some of the seminal literature on framing, a single overarching explanation of what constitutes “framing theory” would appear to be somewhat elusive. On framing theory for example, Entman (1993) wrote that “nowhere is there a general statement of framing theory that shows exactly how frames become embedded within and manifest themselves in a text or how framing influences thinking” (p. 51). Scheufele (1999) later pointed out that “research on framing is characterized by theoretical and empirical vagueness in part because it lacks a commonly shared theoretical model” (p. 103).

Some framing scholars have looked at how an issue is characterized in news reports influences the way people understand the issue (Scheufele & Tewksbury, 2007). In this sense, “framing” can be thought of as something media do to a story. Consciously or unconsciously, news media selectively choose which elements of a story to emphasize and which elements to de-emphasize as a matter of course.

Central to this type of framing research is the concept of a media frame. A media frame therefore is a “central organizing idea or story line that provides meaning to an unfolding strip of events” (Gamson & Modigliani, 1987, p. 2). Scheufele (1999) argued that “media frames are necessary to turn meaningless or non-recognizable happenings into a discernible event” (p. 106). Gitlin (1980) wrote, “media frames are working routines for journalists to quickly package and relay information to their audiences” (p.7).

For example, the media could frame a story about a proposed tax cut in various ways. On one hand, the media could choose to emphasize how the proposed tax cuts would result in significant reductions to government programs that serve the poor. This type of framing would emphasize the

consequences of the proposed tax cuts. On the other hand, the media could also choose to emphasize how the tax cuts will put more money in the pockets of consumers enabling them to purchase or save more. This type of framing would emphasize the benefits of the tax cuts.

Not all framing research, however, can be characterized as news or media framing and the use of frames is not exclusive to journalists and journalism scholars. When developing messages and appeals promoting health behaviors for example, health communicators and other message developers are faced with a choice of how they are going to characterize the health behaviors to the message recipients. Health promoting messages often stress the value of engaging in a healthy behavior or of not engaging in an unhealthy behavior (Van 'T Riet, Ruiter, Werjj, Math, & DeVries, 2009). Accentuating certain aspects of health behaviors at the expense of others is also referred to as “framing” (Hoffner & Ye, 2009). For example, one could frame benefits that would accompany the adoption of an exercise program (weight loss, better health, more energy) or the consequences of not exercising (weight gain, loss of conditioning, risk of adverse health consequences).

Thus, while the field of health communication and field of journalism are distinct (although there are certainly areas where they overlap), the concept of framing is highly relevant to both. Regardless of the field in which frames are utilized, framing can generally be said to involve selection and salience (Entman, 1993). To frame therefore, according to Entman (1993), is to “select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and or treatment recommendation for the item described” (p. 52). Frames, Entman (1993) argued “define problems such that they determine what a causal agent is doing and with what costs and benefits” (p. 52).

2.1.1 Message framing

Many types of information or messages can be framed in different ways. Perusing online used car ads for example, one can certainly see some of the most creative uses of framing ever imagined. For example, if I want to persuade people to buy my beat-up 1984 Chevy Citation, I am certainly going

to want to emphasize in the ad the great gas mileage over the non-existent curb appeal, blown head gasket, and faulty power steering. Though it might seem frivolous, a used car ad is a great example of how frames can be used to try to persuade someone to do something that the message sender wants them to do. In this case, the car seller wants to unload his junk car on someone else by making salient all of the benefits (such as they are) of purchasing it. Of course, frames can be also applied to messages and appeals designed to persuade people to act in other ways as well. Broadly, this concept is referred to as message framing.

Yan, Dillard, and Shen (2012) defined message framing as the idea that “persuasive appeals can be designed to focus on either the advantages of pursuing some course of action (i.e. gain framed) or the disadvantages of failing to do so (i.e. loss framed)” (p. 682). Message frames are often utilized in appeals to persuade people to have favorable attitudes toward and ultimately adopt many health behaviors. One common way to frame health messages is to use a gain (advantage) frame or a loss (disadvantage) frame. To engage in health message framing, developers of health messages decide which aspect of the health behavior to emphasize and which aspect to de-emphasize. For example, smoking cessation, a health behavior often targeted by public health officials can be framed in terms of the gains it may achieve (e.g., “Quitting smoking now can immediately lower your chance of heart disease”) or in terms of the losses that could be incurred if such behavior is not adopted (e.g., “Continuing to smoke increases the likelihood that you will die of heart disease”).

It should be pointed out that the adoption of a health behavior doesn’t necessarily guarantee any specific outcome. Wearing a seatbelt, for example, can greatly increase one’s chance for survival in an accident, yet tragically many people are still killed each year in auto accidents while they were wearing seatbelts while others walk away unscathed without wearing a seatbelt. Likewise, one may reap the benefits of quitting smoking but still die of smoking related illnesses. A person also may escape an unpleasant cancer-related death and continue to smoke until they are 100. This is illustrative of the fact that no matter how a health behavior is framed, engaging in any type of health behavior, whether good

or bad, does not always ensure certain health outcomes. In other words, choosing to behave in a certain way may involve certain expectations that something will happen but also carries with it risks that that “something” may or may not actually happen. These potential outcomes, for which the probability can rarely be ascertained, can be referred to as “prospects” and provide the basis for Kahneman and Tversky’s (1984) prospect theory. In most cases people making decisions about what course of action to take do not know for certain what the outcome will be, so their decisions can be said to be made under conditions of uncertainty. That is, their decision to do something carries with it the risk that something else may happen. As Tversky and Kahneman (1981) pointed out, how various courses of action are framed can influence what course of action people ultimately take.

2.2 Decision making under conditions of uncertainty

The notion that people make decisions under conditions of uncertainty is not a novel concept. Milton Friedman and L.J. Savage wrote that people are often faced with situations where they can choose courses of action with different subjective risks (Friedman & Savage, 1948). Kahneman and Tversky (1979) pointed out that decision-making under conditions of risk can be viewed as a choice between prospects or gambles. According to Tversky and Kahneman (1981), the major theory of decision making under risk is the expected utility theory (EUT). According to expected utility theory, “a prospect is acceptable if the utility resulting from integrating the prospect with one’s assets exceeds the value of those assets alone” (Kahneman & Tversky, 1979, p. 264). EUT broadly states that when people are faced with a choice between risky propositions or prospects they will choose the prospect that provides maximum expected value or “utility” of some quantity (Friedman & Savage, 1952). Yet Kahneman and Tversky (1979) demonstrated that people do not always act this way by finding that people often act in ways that violate the tenets of the expectancy utility theory. For example, using various decision problems involving monetary gambles, they found that people would often prefer taking a smaller amount of money as a “sure thing” rather than a modest gamble for a higher sum. When people prefer a “sure thing” over a gamble with a higher value, it is known as risk aversion

(Kahneman & Tversky, 1984). Conversely, rejection of a sure thing in favor of a gamble of lower and equal expectations is called risk seeking (Kahneman & Tversky, 1984).

2.2.1 Framing and Prospect Theory

The model by which these violations of expected utility theory are taken into account is called prospect theory (Kahneman & Tversky, 1979). To illustrate prospect theory, Kahneman and Tversky (1984) used a fictional scenario of a deadly disease outbreak expected to kill 600 people to ask about people's preferences among two different treatment options. The first experimental group was asked to choose between one treatment that would save 1/3 of the people and a second treatment that had only 1/3 probability of saving all 600 people but a 2/3 probability that no one would be saved (Kahneman & Tversky, 1984). In this case, a very large percentage of respondents (72%) chose the "sure thing" of saving 200 people (Kahneman & Tversky, 1984). The second group was given the same scenario and asked to choose between an option where 400 people would definitely die and an option where there was a 1/3 probability that nobody would die but a 2/3 probability that all 600 would die (Kahneman & Tversky, 1984). In this case, an even larger majority (78%) chose the second option with a high probability that many would die (Kahneman & Tversky, 1984). What is notable is that the two sets of treatment choices in these problems are identical in their outcomes yet they were framed differently, in terms of people being saved or dying. The fact that people had markedly different treatment preferences in the two problems illustrates the power of frames to influence people's decision making. As this problem illustrates, it is not only possible to frame a given decision problem in more than one way, but how one frames the problem can affect what choice people make (Kahneman & Tversky, 1984).

2.3 Framing health decisions

One major line of research seeks to answer how differently framed messages affect people's attitudes toward a health behavior and their willingness to adopt the health behavior. O'Keefe (2002) defined persuasion as "a successful intentional effort at influencing another's mental state through

communication in a circumstance in which the persuadee has some measure of freedom” (p.5). The implication is that when people are persuaded, they have moved beyond simply processing the message to potentially acting upon it, assuming that they have the free will to do so. Thus, the extent to which frames can influence persuasion has also been of interest to scholars.

O’Keefe and Jensen (2006) suggested that there are two broad framing research questions worthy of study. The first relates to the overall difference in persuasion between gain and loss framed messages while the second relates to what factors moderate (or mediate) the relative effectiveness of these appeals (O’Keefe & Jensen, 2006). Research in that regard has been somewhat disappointing. Recent meta-analyses (O’Keefe & Jensen, 2007, 2009), which notably reviewed a large number of framing studies related to health messages, suggest that it doesn’t really matter which frame one uses in a health message because neither the loss or gain frame alone holds a persuasive advantage (O’Keefe & Jensen, 2007, 2009).

At the surface, these findings could imply that further research on the effectiveness of framing in health messages would seem somewhat superfluous. The question of whether or not frames alone have any demonstrable impact on health behavior would appear to have been answered. But it is reasonable to consider the possibility that human health behavior is unlikely to occur as the result of a single message factor such a framing. Every health decision is likely to be impacted by more than what frame was utilized in a particular health message. Therefore, to further message framing research, researchers must go beyond simply asking the question of what effect the frame by itself has on the behavior. Framing research must ask questions to determine under what specific conditions each type of frame is more effective.

For example, in the wake of O’Keefe and Jensen’s meta-analyses (2007, 2009), it was suggested that framing effects do in fact exist and that an understanding of them can only be achieved by identifying other variables upon which those effects are contingent (Yan, Dillard, & Shen, 2010). Latimer, Salovey, and Rothman (2007) made a similar argument by proposing that there are many

opportunities to advance framing research particularly as researchers begin to look at other factors that could impact the effectiveness of gain/ loss frames. Rothman, Bartels, Wlaschin and Salovey (2006) suggested examining under what conditions frames could be optimally used. Likewise, Shen and Dillard (2007) argued that research must develop conceptual frameworks that link empirical features of messages (e.g., frames) and persons with subsequent portions of the persuasion process. Looking only at features of messages would be short sighted as there are certainly other factors apart from the messages themselves that could interact with message frames to influence behavior. The following section reviews recent framing literature that has explored factors influencing message frames in health contexts.

2.4 Factors that can influence message frame persuasiveness: Health behavior

Type of health behavior has been considered a factor that can influence the effectiveness of frames. For the purposes of this study, I will focus on two types of health behaviors: health prevention behaviors and disease detection behaviors. Health prevention behaviors (like smoking cessation) are behaviors that are performed to help prevent the onset of disease, injury, or other adverse health outcomes whereas health detection behaviors (like mammography) are those that detect the presence of disease (Van 'T Riet, Ruiter, Werjj, & DeVries, 2010).

People tend to view these behaviors differently. According to Rothman and Salovey (1997), people perceive disease prevention behaviors as relatively safe, because they minimize the chance of getting sick. In contrast, people perceive disease-detection behaviors as inherently risky because they entail the possibility of finding out that one is ill (Van 'T Riet et al., 2010). Early detection of disease conditions can potentially have substantial benefits such as reduced risk of death and availability of a larger number of treatment options (Smith, Cokkinides, & Eyre, 2007). But as previously stated, these types of behaviors carry with them the inherent risk that the decision maker, that is, the person who decides to engage in a disease detection behavior, is faced with risk of possibly finding out that they

have a disease. Depending on the disease, this can lead to a great deal of anxiety or fear in the decision maker, as anyone who has awaited the results of a mammogram or an HIV test can probably attest.

Type of health behavior has been studied frequently within the context of gain/loss framing appeals. In fact, O’Keefe and Jensen (2006) stated that type of health behavior (health prevention vs. health detection) is one of the most well-known and perhaps well studied moderating factors for the relative effectiveness of framed appeals. For example, based on their own analysis of framing studies, Rothman and Salovey (1997) and Salovey, Schneider, and Apanovitch (2002) suggested that loss-framed messages would be more persuasive than gain-framed messages for disease detection behaviors while gain-framed messages would be more persuasive for prevention behaviors. Citing Tversky and Kahneman’s prospect theory (1981), O’Keefe and Jensen (2006) suggested that “the results of framing research indicate that persons are more likely to undertake risky (uncertain) behaviors when potential losses are salient but prefer risk-averse choices when gains are prominent” (pp. 5-6). They also suggested that this explains why loss frames would be more effective for disease detection behaviors and gain frames would be more effective for disease prevention behaviors (O’Keefe & Jensen, 2006). In other words, because disease detection behaviors carry with them the risk that someone will “find something wrong,” it has been posited that loss framed messages would be more effective at getting people to adopt health detection behaviors.

It is not insignificant then that O’Keefe and Jensen’s (2006) meta-analytic review concluded that gain and loss framed appeals did not significantly differ in persuasiveness concerning disease detection behaviors. A later review by O’Keefe and Jensen (2009) seemed to corroborate these earlier findings by concluding again that loss-framed appeals did not appear to have a substantial advantage for encouraging disease detection behaviors, a finding that they readily acknowledge was a “rather disappointing conclusion” (p. 304). In fact, they went so far as to posit that “those who have the responsibility of designing messages aimed at encouraging disease detection behaviors should not believe that choosing loss-framed messages will substantially improve persuasiveness” (O’Keefe &

Jensen, 2009, p. 304). They did acknowledge, however, that there was a very small nonzero overall population effect, with some similarly small population effect for each specific detection behavior (O’Keefe & Jensen, 2009). These findings were used by O’Keefe and Jensen (2009) to explain why in some cases a small advantage was observed for loss framed messages in breast cancer detection behaviors.

One of the few framing studies that have appeared since the 2009 meta-analytic review that addresses a disease detection behavior is a study by Van ‘T Riet et al., (2010) that looked at skin cancer detection. This study came to the conclusion that loss-framed messages were more persuasive than gain framed messages, but only for participants with high self-efficacy to engage in monthly skin self-examination (Van ‘T Riet et al., 2010).

2.4.1 Genetic screening for cancer: What type of health behavior is it?

Since genetic screening for cancer is the health behavior of interest in this study, it is fair to ask what type of health behavior it is. In general, I would argue that genetic screening cannot necessarily be thought of as a “true” disease detection behavior. In most cases, genetic cancer screening does not detect cancer but rather detects potentially harmful genetic mutations that may increase the risk for cancer. The presence of such mutations does not necessarily mean that a person will get cancer, only that they may be more susceptible to a certain type of cancer. However, knowing that one is more susceptible to cancer due to the presence of a mutation can lead to a person adopting interventions that can possibly reduce the risk of cancer. For example, interventions that may reduce the risk of cancer in women who are BRCA mutation carriers include earlier and more frequent or intensive cancer screening, use of certain risk-reducing medications, and even risk-reducing surgery such as mastectomy (Moyer, 2014). Nevertheless, I would make the argument that because its primary purpose is to detect the presence of genetic mutations indicative of susceptibility to cancer, that genetic screening for cancer, and by extension, discussing genetic screening for cancer, would be considered more similar to a disease detection behavior as opposed to a disease prevention behavior. Therefore, for the purposes of this

study it will be characterized somewhat cautiously as a disease detection behavior that can lead to disease prevention measures.

2.5 Individual characteristics and their impact on frame

2.5.1 Demographic and social factors

Some recent studies have sought to answer the question of whether demographic factors such as ethnicity and age as well as social factors can interact with message frames to produce different effects on the adoption of health behaviors. For example, the relatively recent development of the human papilloma virus (HPV) vaccine has led to a proliferation of health promotion activities devoted to getting young women vaccinated, especially in light of the fact that among sexually active women between the ages of 14-19, HPV has a prevalence rate as high as 39.6% (Dunne, Unger, Sternberg, McQuillan, Swan, Patel, & Markowitz, 2007). There have been recent studies that have addressed the use of gain / loss framing within the context of HPV vaccination messaging where demographic and factors have come into play in determining the effectiveness of a given message frame.

A recent study by Lechuga, Swain, and Weinhardt, (2011) found that gain / loss frames exerted different effects across ethnic groups such that African-American and Hispanic mothers of daughters in the targeted age range were more responsive to loss frames but that non-Hispanic white mothers responded equally to gain and loss frames in their intentions to get their daughters vaccinated, suggesting for the latter group at least, framing did not matter. It was suggested that this was because people from collectivist cultures (e.g. African American, Hispanic) attempt to “fit in” by fulfilling roles and obligations and hence may be more oriented towards avoiding losses (Elliot, Chirkov, Kim, & Sheldon, 2001; Lee, Aaker, & Gardner, 2000). In another study, Cronan, Conway, Davis, and Vasserman-Stokes (2011) studied the effectiveness of gain and loss framed messages to increase colon-rectal cancer screening among low income Caucasians, African-Americans, and Mexican -Americans and found that only Caucasians were more responsive to gain framed message. No preference for frame

was found in the other groups. In terms of the responsiveness of Caucasians at least, this was the opposite of what the researchers predicted (Cronan et al., 2011)

The question of whether age can impact the relative impact of different frames was examined in a meta-analysis by Mata, Josef, Samanez-Larkin, and Hertwig (2011) which concluded that there were no clear age-related differences as a function of gain / loss framing.

2.5.2 Individual Perceptions and beliefs

A considerable amount of the recent research on factors that interact with frames has studied how various individual perceptions can interact with message frames to produce different effects. Perceptions in this context could include self-efficacy related to the individual's belief in their ability to perform the recommended behavior, the belief that the health behavior will actually be effective (response efficacy), and the perceived susceptibility of the individual to the health condition. Notably, all of these factors are constructs from the health behavior model (HBM).

The HBM states that preventive health behavior results when readiness to act (presence of perceived susceptibility and perceived seriousness of the health issue /illness) and efficacy of the recommended response (perceived benefits outweigh perceived barriers) work cumulatively (Chew, Palmer, Slonska, & Subbiah, 2002). In other words, according to the HBM, for a person to adopt a preventive health behavior, they have to believe not only that they are at risk for a condition and that it poses a threat to them, but also that the action being recommended will work to protect them and that they have the ability to adopt the behavior (response efficacy). The extent to which these factors have interacted with message frames to impact (or not impact) health behavior has been the subject of some recent framing research.

2.5.3 Self-efficacy

Self-efficacy is the belief that one can perform an action intended to reduce the impact of a condition (Strecher & Rosenstock, 1997). Self-efficacy is distinct from response efficacy, which is the

belief that the health behavior will attain the desired result (e.g. prevent or detect the disease). The extent to which frames can influence self-efficacy in health messages has been studied. Van 'T Riet, Ruiter, Werrij, and Vries (2008) discovered that individuals with high self-efficacy beliefs about quitting smoking had higher levels of motivation to quit smoking after viewing a loss-framed message, but that individuals with low self-efficacy didn't seem to be more motivated by either a gain or a loss framed message. At least among high self-efficacy participants, this could be attributed to loss aversion. Among those with low-efficacy, it could simply be that their lack of belief in their ability to quit smoking overrode any influence a framed message might have. In the case of low-efficacy smokers at least, it would appear that efforts should be directed at increasing their self-efficacy beliefs about smoking cessation.

In another study addressing framed messages and skin cancer detection measures, Van 'T Riet, Ruiter, Werjj, and De Vries (2008) found that loss-framed messages were more effective for those with high self-efficacy, and once again there were no differences among those with low self-efficacy. In a third framing study that looked at self-efficacy related to salt consumption, Van 'T Riet, Ruiter, Smerecnik, and de Vries (2010) found that participants who received information designed to increase self-efficacy were more responsive (i.e., more likely to reduce their salt consumption) to the loss framed message than the gain framed message whereas those who did not receive the self-efficacy enhancing messages were not differentially influenced by either frame. These studies clearly show that individuals with low self-efficacy do not appear to be more responsive to either type of frame suggesting that efforts to increase self-efficacy will need to look at factors other than message framing.

2.5.4 *Response efficacy / Response risk*

Response efficacy is the extent people believe a recommended response deters or alleviates a health threat (Rogers, 1975, 1983; Witte, 1992a, 1994). Framing and response efficacy was studied by Nan, Xie, and Madden (2012). These researchers analyzed framing of H1N1 flu vaccination messages and found that loss-framed messages were more effective than gain-framed messages at increasing

intent to get vaccinated among older adults with low response efficacy beliefs, but that the loss / gain frames made no difference for those with high response efficacy. They suggested that messages about H1N1 targeting older adults should seek to match individuals with low perceived efficacy with loss framed messages while at the same time arguing that either a loss or a gain frame would be beneficial to those with a high response efficacy (Nan et al., 2012). What this would seem to suggest then is that in the case of H1N1, a loss framed message would be the most effective since among those with high response efficacy frame doesn't matter but among those with low response efficacy, loss frames to appear to be more effective.

To some extent, there is some element of risk inherent all health behaviors. Few health prevention or health detection behaviors come with a 100% guarantee. For example, one may adopt a health prevention behavior (e.g. flu vaccine) believing it will be effective and then get the flu anyway. In this case, the person tacitly accepted that risk when they adopted the behavior. By the same token, one can adopt a health detection behavior (e.g. mammogram) thinking that they probably won't find out that they have breast cancer and instead learn that they do. The extent to which risk is associated with a given health behavior has also been studied within the context of message framing.

Bartels, Kelly, and Rothman (2010) determined that when the risk associated with a health behavior (either prevention or detection) was low, gain-frames were more effective but that when risk associated with the health behavior was high, loss-frames were more effective. Unlike the previous experiment, this does seem like a manifestation of loss aversion, such that higher risks engender more extreme responses, hence the higher effectiveness of the loss frame in this case.

Considering the many health risks posed by smoking, it may be hard to imagine that some people may view quitting smoking as a risky activity. But to some, particularly women, it poses the risk of weight gain, increases in negative affect, loss of enjoyment, and the unpleasantness of nicotine withdrawal (Toll, Salovey, O'Malley, Mazure, Latimer, & McKee, 2008). Thus, to some considering smoking cessation, they must weigh those risks against those of continuing to smoke. In their study,

Toll et al. (2008) found that women with low perceptions of risk related to smoking cessation are more responsive to gain frames whereas women with high risk perceptions of smoking cessation had no preference for frame.

2.5.5 Perceived susceptibility / ease of imagination

If one does not feel they are at risk for a given health condition, they do not perceive themselves to be susceptible to that health condition. Does perceived susceptibility have an impact on what frame is more effective? A recent study found that average to higher levels of perceived susceptibility for breast cancer were more likely to be screened after viewing a loss framed messages than a gain-framed messages (Gallagher, Updegraff, Rothman, & Sims, 2011). In this case, it would appear that the more susceptible one feels to a given condition, the more responsive they will be to a loss frame. This finding seems to be consistent with the concept of loss aversion.

Ease of imagination on the other hand, is the degree to which bodily changes or states are subjectively easy to visualize (Broemer, 2004). This can be seen as somewhat similar to the simulation heuristic which is the ease that people can imagine or construct events or scenarios (Kahneman & Tversky, 1982). Sherman, Cialdini, Schwartzman, and Reynolds (1985) showed that individuals judged the likelihood of contracting a disease to be higher when the symptoms were relatively easy to imagine, but as less likely when symptoms were difficult to imagine. In other words, perceived susceptibility can be related to the ability of people to imagine themselves in a disease state. The concept of ease of imagination can also apparently be applied to outcomes as Broemer (2004) showed that negatively framed health promotion messages about physical activity resulted in more positive attitudes when decision makers could easily imagine the outcomes of not exercising (heart disease for example). Interestingly, Berry and Carson (2010) were not able to replicate Broemer's 2004 findings in their own study which found that there was no main effect of message framing on attitudes towards physical activity, and no interaction between message framing and ease of imagination.

So far, this review has looked at many factors that have been found to influence framed health appeals. There are undoubtedly other factors that should also be examined. One such factor may be emotions. Emotions might be important to consider because it is thought that emotions can influence attitudes, which then affect behavioral intention (Shen & Dillard, 2007). So, I would argue that emotions, including emotions elicited by gain/loss framed messages could influence the effectiveness of health appeals.

Since at any given time, most people experience some type of emotional state, it is important to consider the possibility that they could also influence receptivity to gain or loss framed health appeal and possibly influence behavior. In general, emotions are considered “states” as opposed to “traits.” States are transient experiences that can change sometimes as quickly as moment to moment (Grawitch, 2013). Someone making a decision about whether or not to adopt a health behavior may choose differently depending upon how they feel or what emotion they are experiencing at the time. Emotions are individual characteristics that have recently been studied for their potential to interact with message frames in influencing persuasion (Shen & Dillard, 2007; Yan et al., 2012).

The study of emotion is of immense interest in framing research because it is thought that emotions can influence attitudes, which then affect behavioral intention (Shen & Dillard, 2007). If emotions can influence attitudes and thus influence behavior, the extent to which this can impact the adoption of health behaviors is of great importance. Thus, it is important to gain a fuller understanding of how health messages may stimulate emotion, and which emotions are most effective at changing attitude.

2.6 Overview of emotions

Can a health message make someone fearful, disgusted, or angry? Certainly. Recent ads by the Centers for Disease Control (CDC) seem to try to “scare” smokers into quitting by graphically showing the consequences of smoking (e.g. showing a tracheotomy ring in the throat of a smoker). Another relatively recent ad on smoking cessation featured a graphic portrayal of a young man coughing up a

diseased lung, ostensibly from smoking, at the dinner table. It is easy to see how someone might find that disgusting. The more important questions regarding these ads are whether or not they were persuasive to the extent that they resulted in any demonstrable attitude or behavioral change among those targeted by the health messages,

The aforementioned health campaigns clearly elicited what are commonly thought of as “negative emotions” (anger, fear, disgust), that is they tend to evoke reactions that are unpleasant. Health messages have arguably also tried to elicit positive emotions such as hope. For example, another recent anti-smoking ad carried the message that it is ok to fail at quitting and to just keep trying because sooner or later you will succeed. Someone trying to quit smoking may find this message reassuring and slightly hopeful – in contrast to the fear that may be evoked by shocking images of disfigured smokers. Perhaps as a result of the positive emotional response, the person may even call the quit line featured in the ad.

2.6.1 Emotion defined

What exactly is emotion? Unfortunately, there does not seem to be a single all-encompassing definition that can be definitively referred to as the one “true” definition of emotion. Plutchik (2001) says “that the study of emotion is one of the most confused (and still open) chapters in the history of psychology,” with over 90 definitions proposed for emotion in the 20th century alone” (p. 344). So while there appear to be many competing definitions for emotion, an emerging consensus seems to agree that “emotions are best conceptualized as multi-component response tendencies incorporating muscle tension, hormone release, cardiovascular changes, facial expressions, attention, and cognition that unfold over a relatively short time span in response to an event” (Fredrickson & Cohn, 2008, p. 778). An emotion is the process of recruiting resources from various physiological, motivational, and cognitive subsystems that shift an organism (a person) into a state of being that will address the person-environment relationship (Lazarus, 1991; Oatley, 1992).

Similarly, Lang (1984) defines emotion as a broad response disposition that may include measurable language behavior, organized overt acts, and a physiological support system (somatic and visceral) for these events. Emotions are, by definition, associated with urges to act in particular ways, urges that have been called specific action tendencies (Frijda, 1986; Frijda, Kuipers, & Schure, 1989; Lazarus, 1991; Levenson, 1994; Tooby & Cosmides, 1990). But often, emotions by themselves are not sufficient to evoke behavioral responses. Fredrickson (1998, p. 3) posited that “no emotional theorist would argue that people invariably act out urges when feeling particular emotions.” Plutchik (2001) agrees by saying that “impulses to action are not always followed by action” (p. 348). Clearly there are other factors that interact with emotions to influence whether urges elicited by emotions lead to actions. Plutchik (2001) for example, says that fear of retaliation or embarrassment can influence whether or not a person acts on an emotional impulse. Likewise, whether urges become actions depends on the interaction of many different factors including but certainly not limited to ability to control impulses, individual coping skills, cultural norms, and the context in which a stimulus is encountered (Fredrickson, 1998).

Emotions therefore are exceedingly complex, multifaceted, and defy a simple explanation. A broader discussion of the vicissitudes and vagaries of human emotion is well beyond the scope of this paper. Nevertheless, because of their potential role in influencing attitude and motivating action, the study of emotion is of particular interest in health message framing research. Such research may help illuminate the answer to questions posed above about whether gain or loss framed health messages can “scare” or “encourage” someone into action or mediate the effectiveness of message frames in some way.

2.7 Models of emotion: Dimensional vs. discrete emotions

In the previous section, I indicated that the emotions of fear, disgust and anger were thought of as “negative emotions” while referring to hope as a “positive emotion.” To refer to an emotion as either “negative” or “positive” is to characterize the emotions using dimensions that can be applied to multiple

individual emotions. On the other hand, when one refers to an individual emotion and its inherent properties, one is referring to a discrete emotion. What follows is a discussion on the two most prominent models of emotion dimensional model and the discrete model.

2.7.1 Dimensional Emotions

Nabi (2010) noted that there are two basic models of emotion prevalent today: dimensional and discrete. Although a definitive typology of emotional dimensions has proven elusive, the dimensional model views emotions as generalized motivational states characterized by two broad affective dimensions: arousal and valence (Nabi, 2010). Smith and Ellsworth (1985) wrote that level of activation (arousal) and pleasantness (valence) “are the only dimensions that have been found consistently across studies” (p. 814). Nabi (2010) suggested that the dimension of arousal generally characterizes emotions as either resulting in a high or low motivational state. In terms of the dimension of valence, Smith and Ellsworth (1985) argued that there is general agreement that a primary characteristic of every emotion is valence on a bipolar continuum from highly unpleasant to highly pleasant which is a highly oversimplified way of saying that some emotions are pleasant and some are not, although the degrees to which they are either would seem to be able to vary.

2.7.2 Discrete Emotions

The discrete emotional model focuses on categorical emotional states each with their own unique cognitive appraisals or thought patterns (Frijda, 1986; Izard, 1977; Lazarus, 1991). According to Nabi (2010), “such appraisal perspectives hold that particular patterns of thought about the environment relative to one’s goals lead to certain states of action and readiness” (p. 154). Nabi (2010) also suggested that discrete emotions have particular action tendencies (e.g. fear may lead to fight or flight, anger to retaliation). Thus, Nabi (2010) argued that a state is considered a discrete emotion if it has unique appraisal patterns, subjective experiences, and action tendencies.

In general, therefore, the dimensional approach to understanding emotions characterizes emotional responses rather broadly while discrete approach characterizes emotions having specific responses and action tendencies. This study will focus specifically on two discrete emotions: fear and hope.

2.7.3 *Why study discrete emotions?*

Before discussing fear and hope individually, it is important to make an argument for why I am taking the discrete emotional approach rather than the dimensional approach to the study of framed health messages related to messages of genetic cancer screening behaviors.

I will support this position by citing Nabi's (2010) basic argument that the inherent complexities associated with human thought and behavior render the broad dimensional approach to emotions insufficient to understand the processes underlying the persuasive effects of health communication efforts, and more specifically, receptiveness to gain/loss health appeals. By this reasoning, it would seem that the broader response tendencies associated with the dimensional emotional approach (e.g. negatively-valenced emotions) would provide limited understanding of how someone might respond to a gain/loss framed message. Nabi (2010) pointed out that "the dimensional perspective does not allow for the same degree of predictive precision as the discrete emotion paradigm" (p. 155). To say someone reacted negatively to a message promoting some type of health behavior could mean that they responded with anger or fear or disgust, each of which has its own specific response tendencies which in the case of health behaviors may or may not lead to adoption of a health behavior. However, if it is known that a gain/loss framed message elicited fear or hope—both discrete emotions—it would lead to better understanding of how the person might be likely to respond, since fear and hope tend to have their own specific response tendencies. Thus, knowing the various response tendencies associated with discrete emotions makes the discrete paradigm a better predictor of behavior than the dimensional approach.

Izard (2007) also made a strong case for studying discrete emotions by pointing out that they have different predictors as well as different behavioral outcomes. Izard (2007) actually seemed to be

making a case against the dimensional approach by arguing that the dimensional approach of grouping emotions by valence, direction of motivated action, or describing them as “positive” or “negative” is an arbitrary way of classifying emotions.

Although I have chosen as the focus of this study discrete emotions (fear and hope), it is still important to consider emotions dimensionally. Nabi (2010) argued that the dimensional approach provides the essential foundation for emotion-based research even though it may lack for predictive precision of the discrete emotional approach. This is not to say that the dimensional vs. discrete dichotomy is mutually exclusive. In fact, Nabi (2010) wrote that “the beauty of the discrete emotion view is that it incorporates the dimensional perspective in that valence and intensity are assessed” (p. 154).

So at the most basic level, one can argue that fear is dimensionally different from hope because the former is negative while the latter is positive. Because emotions are often dimensionally classified by valence, (i.e. as either a positive emotion or a negative emotion), it is useful to review the fundamental differences between negative and positive emotions and provide a summary of some of the more common negative and positive emotions.

In this dissertation, two discrete emotions will be studied: fear, which is widely considered to be a “negative” emotion as well as hope which is considered to be a “positive emotion.” It should be noted, however, that while fear is classified as a basic discrete emotion in some typologies, notably Izard (1977) and Tomkins (1984), hope is not contained in either typology. To that point, hope may not always be thought of as an emotion. In describing hope for example, Penz (2008) never once characterizes hope as an emotion but rather as a “multidimensional and complex construct” (p. 408). Leading hope theorist C.R. Snyder (2002) preferred to view hope as more than solely an emotion but as something that influences emotions related to goal pursuits. So while Snyder indicated that hope can influence emotions, he doesn’t explicitly characterize hope as a discrete emotion in this case. Which begs the question: So is hope a discrete emotion or isn’t it? It is, after all, critical to a study of discrete

emotions to know whether or not one of the main areas of interest—hope—can be classified as such. Unfortunately, as with many concepts described in this paper, there is no one single overriding definition or conceptualization of hope that definitively characterizes it as a discrete emotion.

There are those of course who do consider hope to be a discrete emotion (Stotland, 1969; Lazarus, 1999, Bar-Tal, 2001). The variety of views as to what hope actually “is,” however, puts this writer in the unenviable position of having to, for the sake of argument, make the distinction as to whether or not “hope” is officially a discrete emotion or not. This is due of course to the centrality of discrete emotions to my study. Therefore, I will demonstrate later in this paper that hope does engender specific response tendencies that are often associated with discrete emotions, thus for the purposes of this paper, I will argue that hope is a discrete emotion.

2.8 Negative emotions

Negative emotions function as signals of maladaptation and danger and motivate the individual to respond in a way that reduces maladaptation and danger (Chen & Bargh, 1999; Roelofs, Putman, Schouten, Lange, Volman & Rinck, 2010). For example, when one is threatened, fear may be elicited which may then lead to a response (fight or flight) to mitigate the threat and return the individual to a homeostatic condition. Anger serves to mobilize a person’s energy and making them capable of defending themselves (Izard, 1977). Distress can signal to others that someone is in need of help (Izard, 1977). According to Izard (2007) the basic negative emotions are largely “negative” and include distress / sadness, anger, disgust and fear. Because of its centrality to this dissertation, fear will be discussed in greater detail later in this chapter.

Historically, emotion research has focused on negative emotions (Fredrickson & Cohn, 2008). This is primarily because psychology as a whole tends to focus on understanding and ameliorating psychological problems (Seligman & Csikszentmihalyi, 2000). Some gain / loss framing research has also focused on negative emotions, notably fear and anger (Shen & Dillard, 2007; Gerend & Maner, 2011). Gerend and Maner (2011) pointed out that one of the reasons that negative emotions might be

the focus of so much attention within health communication studies is that negative emotional states like fear and anger are frequently experienced within the context of health decision-making (e.g., receiving a diagnosis; making treatment decisions, etc.). They also suggest that people's "responses to framed health communications vary as a function of people's current emotional state" (Gerend & Maner, 2011, p. 422). One negative emotion that is perhaps most often studied within the context of health communication messages is fear. One does not have to search very long to find health messages intended to elicit fear!

2.8.1 Fear

In his book *Human Emotions*, Carroll Izard (1977) wrote that "fear is the most toxic of all emotions" (p. 355). It is certainly one of the most studied. Izard (1977) claims that "fear has probably been the subject of scientific investigation more than any other fundamental emotion" (p. 355). Fear has been characterized as a negatively-valenced emotion (Easterling & Leventhal, 1989; Lang, 1984; Ortony & Turner, 1990) In general, fear mobilizes energy and motivates individuals to escape from danger (Izard, 1977). As previously mentioned, fear is an emotion of great potency and has a very profound effect on an individual's perception, thought, and action (Izard, 1977). Typically, fear is accompanied by apprehension, uncertainty, the feeling of a lack of safety, and impending doom (Izard, 1977). Additionally, fear can also be characterized by appraisals of low certainty and lack of personal control (Slovic, 1987). Fear can derive from internal or external events, conditions, or situations that signal danger the threat of which can be physical or psychological (Izard, 1977). In other words, fear is generally associated with some type of threat to an individual. Health messages have often attempted to make the threat of an undesirable health outcome more salient to people in an effort create fear. Such health messages are called fear appeals.

2.8.2 *Fear appeals*

Sometimes a health message can attempt to portray something as a threat to a person's health or well-being and do so in a way that can cause fear. Health messages that attempt to stimulate fear in those receiving the messages are referred to as fear appeals. Specifically, fear appeals are persuasive messages designed to scare people by describing the terrible things that will happen to them if they do not do what the message recommends (Witte, 1992a). For over half a century, fear and fear appeals have been studied extensively within the context of health communication as a persuasive tactic to encourage audiences to engage in healthy behaviors (for reviews, see Boster & Mongeau, 1984; Witte & Allen, 2000). In general, fear appeal messages will incite action to the degree that they successfully convince message recipients that they are susceptible to severe consequences associated with the threat (Maloney, Lapinski, & Witte, 2011). Research also suggests that fear-arousing messages can motivate protective behaviors when people believe they are able to adopt responses (self-efficacy) that effectively avert the threat (response efficacy) (Witte, 1992a, 1992b, 1994, 1998).

2.8.3 *The Extended Parallel Process Model*

Fear's impact on behavior can be described using the extended parallel process model. The extended parallel process model (EPPM) attempts to describe what happens when a person encounters a fear appeal and to explain when and why these persuasive messages may work or fail (Witte, 1992a, 1994, 1998). A fear appeal initiates two appraisals in the individual receiving the message (Witte, 1992a). First, a person will appraise the perceived threat of the hazard and if the threat results in moderate to high perceived threat, fear will be elicited (Easterling & Leventhal, 1989; Lang, 1984). When fear is elicited people are then motivated to begin a second appraisal which is an evaluation of the efficacy of the recommended response (Witte, 1992a). When perceived threat and perceived efficacy are high, danger control processes are initiated such that the individual is motivated to control the danger by thinking of strategies to avert the threat (Witte, 1992a). In other words, they seek to act in a way that mitigates the threat. They are responding to the danger and not their fear (Witte, 1992a)

On the other hand, when perceived threat is high but perceived efficacy is low people act to control their fear rather than the danger (Witte, 1992a). In other words, rather than acting in ways that mitigate the threat, people act to control their fear, for example by engaging in maladaptive responses like denying or dismissing the threat altogether (Witte, 1992a).

2.8.4 The effectiveness of fear appeals

As previously stated, fear appeals are a common technique used by health message designers and thus are seen quite frequently. A cursory review of the literature reveals a plethora of studies on the effectiveness of fear appeals in health messages. Though a complete review of these studies is beyond the scope of this paper, and for that matter has already been done (see Tannebaum, 2013), it is instructive to review some recent studies to gain a better understanding of the many different health behaviors for which fear appeal effectiveness studies have been conducted.

In short, according to a recent meta-analysis by Tannebaum (2013), fear appeals do work, but like frames, there can be a variety of moderators and situations that can impact the effectiveness of fear appeals. Likewise, fear appeals may be effective in raising awareness or arousal but not necessarily always effective at changing attitude behavior. For example, Halkjelsvik, Lund, Kraft, and Rise (2013) found that tobacco control fear appeals led to an increase in motivation to quit smoking but did not appreciably change smoking status. A meta-analysis of the influence of fear appeals on safe driving behavior by Carey, McDermott, and Sarma (2013) found that fear appeals led to greater arousal but did not actually lead to changes in driving behavior. A study in Tanzania showed that young people preferred HIV related fear appeals in that they were more effective instilling or reinforcing high perceived susceptibility but not necessarily effective at reinforcing response and self-efficacy (Bastien, 2011). Respondents in this study expressed a desire for more information about how to protect themselves from HIV, suggesting that for fear appeals to be more effective they should contain information that will lead to better response efficacy, that is provide people with information they can use to reduce the threat (Bastien, 2011). This is somewhat consistent with recent findings by

Tannebaum (2013) and with the extended parallel process model, which suggests that higher response efficacy can lead to adaptive responses to threats (Witte, 1992a). In short, it would appear that in many cases fear appeals should be accompanied by information on how to reduce threats rather than simply containing graphic portraits of undesirable outcomes.

But in some cases, the effectiveness of shocking imagery has enhanced the effectiveness of fear appeals. For example, in a study that looked at ads to prevent meth use, Morales, Wu, and Fitzsimons (2012) found that adding an element of disgust (e.g., extremely graphic and disgusting photos) added to the effectiveness of fear appeal messages resulting in lower reported intentions to use illegal drugs. This study is notable for its elicitation of two negative emotions (fear and disgust) and pointed out that adding the element of disgust resulted in a more persuasive message than merely using fear alone (Morales et al., 2012).

Although there is considerable evidence that in some circumstances fear appeals can be effective, that is by no means always the case. In a study of low- to moderate- fear appeals relating to distracted driving, Lennon, Rentfro, and O’Leary (2010) found that fear appeals were actually counterproductive leading to a “boomerang” effect where the intention to perform maladaptive behaviors (e.g., talk or text while driving) actually increased. Obviously this is not a desirable outcome and is an example of the inconsistency sometimes encountered in fear appeals research.

In the previous sections I have discussed both the emotion of fear and the concept of fear appeals. It is important for the purposes of this study, however, to make a distinction between “fear” and “fear appeals.” As has been discussed, fear itself is an emotion while fear appeal is a persuasive attempt to elicit the emotion of fear. What perhaps needs to be disentangled in studies involving fear and fear appeals is a better explanation for what actually leads to positive attitudes toward a health behavior—the emotion of fear or the content of the fear appeal itself. It is entirely possible that both emotion and message play some role, a possibility which will be explored later in this study when emotions are hypothesized as mediating the relationship between message and outcome.

2.9 Positive emotions

Clearly there has been much research on health appeals eliciting negative emotions, most notably fear. However, there appears to be somewhat less research on the use of positive emotions in health appeals. Fredrickson (1998) argues that even though research on emotions has flourished in recent years, investigations that expressly target positive emotions remain few and far between. Perhaps one of the reasons that this is the case is that in general, there appear to be a smaller number of discrete positive emotions. For example, Izard's (1977) list of basic emotions includes seven negative emotions (fear, anger, distress, disgust, contempt, shame, and guilt) and only two positive emotions (joy and interest). For the record, Izard (1977) classifies surprise as either a positive or negative emotion. Minus the emotion of guilt, Tomkins (1984) proposed the same typology for emotion. More recent typologies, however, such as that developed by DeSmet (2012) seem to have as more positive emotions listed, including hope, courage, sympathy, and many others. Like emotion itself, defining what exactly positive emotions are seems to be somewhat difficult. Included in their chapter on positive emotions, Fredrickson and Cohn (2008) have a section titled "Defining Positive Emotions" (p. 778) which interestingly enough doesn't actually provide a definition of positive emotions. This would appear to speak volumes about the apparent difficulty of providing a definition. Instead they cite how the "distinctions between positive emotions and other closely related affective states such as positive mood are blurry" (Fredrickson & Cohn, 2008, p.778). They also wrote that "positive emotions resemble positive moods but differ from them in that positive emotions are about some personally meaningful circumstance" (p. 778). This is useful but still does not really tell us what positive emotions are. Though Frijda et al. (1989) don't necessarily define positive emotions either, they at least illustrate how they are fundamentally different, at least in terms of behavioral impact, by pointing out that negative emotions stimulate people to reject or withdraw from a stimulus while positive emotions cause people to gravitate toward a stimulus.

In terms of health appeals, an obvious question becomes, can positive emotions motivate any type of action? Certainly it has been shown that negative emotions such as fear and anger under the certain circumstances can motivate people to act. For example, fear can cause a person to avoid something that threatens them. Anger can also motivate someone to defend themselves. But again, this is illustrative of two different things: that dimensionally, negative emotions can motivate behavior but that the discrete emotion results in distinct responses.

It is somewhat less clear if positive emotions can have the same effect. It is clear that positive emotions do have some motivational effect. But again, they appear to be tied more to discrete emotions than to the “positive” dimension. For example, Izard (1977) wrote that interest, one of only two positive emotions he discussed, provides much of the motivation for learning and creative endeavor. To joy, the only other positive emotion discussed in any detail in his book *Human Emotions*, Izard (1977) ascribes little motivational power, stating rather that it is a highly desirable emotion characterized by a sense of confidence, meaningfulness and a feeling of being loved. Little about the power of positive emotions to motivate action can therefore be gleaned from *Human Emotions*. Which is perhaps another reason why taking the discrete approach will be far more useful in discerning the power of individual positive emotions to elicit behavior.

As I have illustrated, some typologies of emotion (Izard, 1977; Tomkins, 1984) contained more of what are considered negative emotions. Later typologies (DeSmet, 2012) certainly contain more positive emotions, but in general it would appear that the body of literature on the motivational aspects of positive emotions is not as extensive as that of negative emotions. This is part may be accounted for by what is referred to as a negativity bias.

2.10 The negativity bias in psychological research

Sheldon and King (2001) pointed out that in general, traditional psychology trains its practitioners to view positivity with suspicion thus resulting in the proliferation of a negativity bias in psychological research. Seligman and Csikszentmihalyi (2000) suggested that this is largely because

psychology as a whole tends to focus on understanding and ameliorating psychological problems. To some extent then the “negativity bias” of psychology can be attributed to its nature to understand and perhaps correct problems. Though not necessarily analogous to the negativity bias encountered in psychological research, health appeals research does appear to have its own “negativity bias.”

Tannebaum’s (2013) meta-analysis alone included 132 studies on fear appeals. A cursory search of the term “positive emotional appeals” reveals little in the way of research. Although that should not be taken as confirmation that there has been little or no research on positive emotional appeals, the fact that page after page of fear appeals studies was retrieved by a simple search is certainly telling.

Together, this evidence supports the conclusion that both the field of psychology and the field of health appeals research have somewhat of a negativity bias. Should the relative dearth of research on positive emotions, and more specifically on the use of positive emotions in health appeals, be taken as a sign that they are not important? I would make the argument that the answer to this question is no. As previously indicated, positive emotions can motivate. The broader question, however, becomes which discrete positive emotions motivate and under which circumstances are they most effective relative to negative emotions. What can studying discrete positive emotions within the context of framed emotional health appeals contribute to the communication literature? Understanding more about positive psychology as a whole will hopefully lay the foundation underpinning such questions.

2.11 Positive psychology

The origin of the field of positive psychology can be attributed to Martin Seligman in his 1999 address to the American Psychological Association (Seligman, 1999). In this address, Seligman pointed out that “psychology had largely neglected the latter two of its three pre-World War II missions: curing mental illness, helping all people to lead more productive and fulfilling lives, and identifying and nurturing high talent” (Linley, Joseph, Harrington, & Wood, 2006, p. 4). According to Seligman and Csikszentmihalyi (2000), the aim of positive psychology is to “begin to catalyze a change in the focus of psychology from preoccupation only with repairing the worst things in life to also building positive

qualities” (p. 5). Interestingly, Seligman’s assertions about positive psychology were not necessarily novel. As early as the 1950s Maslow lamented that “the science of psychology has been far more successful on the negative than on the positive side” (Maslow, 1954, p. 354). In short, it appears that in one sense, the role of positive psychology is to address the imbalance of focus in the larger field of psychology that favors study of the negative. But it is not merely a movement to balance the psychological research playing field.

According to Seligman, Steen, Park and Peterson (2005), positive psychology is an “umbrella term for the study of positive emotions, positive character traits, and enabling institutions” (p. 410). To that end, Linley et al. (2006) argued that “positive psychology should seek to understand the factors that facilitate optimal functioning as much as those that prevent it” (p. 7). Of course, the term “optimal functioning” can be open to multiple interpretations. Could one argue, for example, that adopting healthy behaviors over unhealthy behaviors is “optimal functioning”? Linley et al. (2006) wrote “the outcomes of interest to positive psychology may be defined as those subjective, social, and cultural states that characterize a good life including happiness, well-being, fulfilment, and health (at the subjective level)” (p. 8). So to that extent, one could make the argument that “optimal functioning” does entail outcomes that result in health and well-being. According to Linley et al., (2006), positive psychology is about understanding the processes lead to desirable outcomes. Thus, understanding those processes is paramount to gaining more insight into understanding how desirable outcomes occur. One process of interest in this dissertation is the role that health appeals and positive emotions play in eliciting attitudes and behaviors that result in desirable health outcomes.

2.11.1 Why study positive emotions?

As previously indicated, the rather broad characterization of positive psychology does include the study of positive emotion (Seligman et al., 2005). It is important to study positive emotions in the context of health appeals and health decision making because positive emotions and experiences have been found to predict or contribute to many different life outcomes (Lyubomirsky, King, & Diener,

2005). Clearly, positive emotions have an impact on overall health and well-being. For example, people who experience high levels of positive emotions tend to experience less pain and disability related to chronic health conditions (Gil, Carson, Porter, Scipio, Bedaiko, & Orringer, 2004). Fredrickson and Cohn (2008) pointed out that the experience of positive emotions prompt individuals to engage with their environments and take part in many activities that are evolutionarily adaptive for individuals. Perhaps most importantly, as Ong, Mroczek, and Griffin (2011) pointed out, experimental and prospective epidemiological studies are accumulating that indicate numerous aspects of adult health, such as self-reported health, physical functioning, disease severity, and mortality, are influenced by positive emotions. So clearly, positive emotions are linked to desirable health outcomes. Thus, how to leverage the benefits of positive emotions within the context of a health appeal is worth examining. In other words, much the same way that fear-framed messages can sometimes scare people into acting in their own best interests, can hope-framed messages encourage people to do the same thing?

As has been documented in this chapter, a considerable amount of research has accumulated on the effects of gain or loss framed health appeals. Some studies have even looked at how pre-message emotions interacted with message frames to influence the persuasiveness of messages. For example, in a study of effects of pre-message emotions on behavioral system activation, Yan et al. (2012) found that loss frame was more persuasive among fearful individuals and a gain frame produced more persuasion for happy and angry participants. Apart from Yan et al. (2012) very little framing research appears to have studied the effect of positive emotions in framed health appeals. This would seem somewhat surprising considering that positive emotions facilitate approach behavior (Cacioppo, Priester, & Berntson, 1993; Davidson, 1993; Frijda, 1994). Just as a fear appeal can motivate someone to get a flu shot, it is reasonable to hypothesize that some positive emotions could motivate someone to adopt a health behavior. It is critical here to note that fear appeals act by eliciting fear. In other words, the emotions are elicited by the message and are not “pre-message” emotions like those studied in Yan et al., (2012). Notably, this study will analyze the effect of “post-message” positive emotions, that is,

emotions elicited by the message itself. In other words, this study will analyze the effectiveness of one specific positive emotion—hope—which has the potential to motivate behavioral adoption and will be explored later in this paper. But, the argument is made here that positive emotions should be studied for their potential to affect attitudes toward health behaviors and behavioral intentions

Fredrickson (2008) argued that in general, positive emotions differ from negative emotions in that they lead to broadened and more flexible response tendencies while negative emotions lead to specific action tendencies. Fredrickson and Cohn (2008) pointed out that negative emotions (like fear and anger) are adapted for specific and often survival critical situations. Negative emotions they argue appear strongly in the moment because they were evolved to mobilize immediate action (Fredrickson & Cohn, 2008). For example, when faced with a threat, fear can lead to a “fight or flight” response.

The results of positive emotions are more diffuse and generally less urgent (Fredrickson & Cohn, 2008). According to Fredrickson and Cohn (2008), there are high arousal positive emotions such as joy and low arousal positive emotions such as contentment. One could hypothesize that high arousal positive emotions would be more likely to precipitate behavior, although Frijda (1986) found that joy has been linked with “aimless activation” which does not seem to indicate that this particular positive emotion would elicit strong action. This does not necessarily mean that all positive emotions lack the same action tendency. It should be recalled that Frijda (1986) said that positive emotions cause people to gravitate toward a stimulus, which does imply action. At present, however, there does not seem to be much empirical evidence suggesting which positive emotions, that when paired with a framed message, would elicit a desired attitude toward or intent to adopt a health behavior. Nor does there appear to be much evidence to suggest which health behaviors would be best suited to positive emotional appeals.

Yet, positive emotions, in particular hope, are associated with and positively linked to health (Nekolaichuk, Jevne, & Maguire, 1999). Hope has also been studied within the context of cancer. Radwin, Evans, and Rabow (2013) found that hope was negatively correlated with pain intensity though not significantly. Nevertheless, this is suggestive that hope can at least affect the perception of physical

pain. Hope has also been found to help cancer patients better accept with the repercussions from an advanced cancer diagnosis (Reb, 2007). So while there does not appear to be much research that addresses hope specifically within the context of framed health appeals, there has been some research linking hope to positive outcomes particularly in the realm of cancer and cancer treatment. Thus, the extent to which hope can mediate the persuasiveness of message frames is worthy of consideration.

2.12 Hope: An introduction

One of the leading theorists on hope, C.R. Snyder and his colleagues defined hope as a “positive motivational state that is based on an interactively derived sense of successful (a) agency (goal directed energy) and (b) pathways (planning to meet goals)” (Snyder, Irving, & Anderson, 1991, p. 570). Later Snyder (2002) restated this definition of hope as “the perceived capability to derive pathways to desired goals and motivate oneself via agency to use those pathways” (p. 249). Snyder, Lopez, Shorey, Rand, and Feldman (2003) argued that pathways and agency are both necessary to sustain a successful goal pursuit and that neither by themselves is sufficient. Indeed, as Lazarus (1999) pointed out, that “although desire or motivation is an essential feature, hope is much more because it requires a belief in the possibility of a favorable outcome, which gives hope a cognitive aspect distinct from that of motivation” (p. 665). Based upon this characterization, hope would appear to be associated with motivating individuals to take action toward accomplishing a goal.

Though not explicitly stated in those definitions, however, hope as I have argued previously in this paper, is also a discrete emotion. To hope is to believe that something that doesn't presently apply to one's life could still possibly happen (Lazarus, 1999). A good example of a scenario of hope is the occurrence of a life-threatening or illness in oneself or a loved one where a favorable outcome is hoped for (Lazarus, 1999). In the case of cancer diagnosis, one can hope for remission and long-term survival. But what if the illness is incurable, if in other words, there is no hope for a favorable outcome? In such instances hope is still relevant. Lazarus (1999) pointed out that when prospects for a favorable outcome are low, people may have to change to the scope of what can be hoped for. For example, someone

stricken with stage IV pancreatic cancer, a death sentence for all intents and purposes, cannot realistically hope to survive the disease nor that there will be a cure in time to save them. Their hopes may be restricted to having more pain-free days for example (Lazarus, 1999). Notably for the purposes of this study, Bar-Tal (2001) pointed out that hope is also a discrete emotion and a fundamental psychological reaction for every person and thus plays an important role in determining human behavior.

Hope is often goal-oriented. Stotland (1969) wrote that emotion of hope arises when a concrete positive goal is expected. Hope consists of a cognitive element of expecting and an affective element of feeling good about the expected pleasant events or outcomes (Staats & Stassen, 1985). Owen (1989) indicated that hope is simulative and prepares people to attain a goal. Yet it must be acknowledged that the desired goal does not always materialize. Hoping for something, the realization of a goal for example, does not mean it will happen. Certainly many are familiar with the term “dashed hopes,” suggesting that even our greatest hopes can fail to be achieved. Does the possibility of our hopes being dashed lessen the value of hope? Not according to Epstein (1989) who suggests that “if the hope serves to improve one's quality of life and does not cause one to avoid taking adaptive action when it's possible, nor be resentful when the hoped-for outcome does not materialize, then it is obviously desirable” (p. xxv). Even when the prospect of goals not being achieved exists, hope is of value to human well-being. “When all hope fails, there is nothing but despair” wrote Lazarus (1999, p. 654)

2.12.1 Elements of hope

As previously indicated, one of the key elements of hope according to Snyder, Harris, et al., (1991) and Snyder (2002) is that hope is often directed toward the attainment of goals (Snyder, Harris et al., 1991; Snyder, 2002). A goal can be anything that an individual desires to experience, create, get, do, or become (Snyder et al., 2003, p. 123). Further, a goal may be a major lifelong pursuit (like earning at PhD!) or it may be mundane and brief (like getting oneself vaccinated for the flu) (Snyder et al., 2003). One of Snyder's guiding assumptions in his theory of hope is that human actions are goal directed

(Snyder, 2002). Thus, people act in ways that will help them attain their goals. Snyder (2002) identified two major types of goals: positive goal outcome and negative goal outcome. Positive goal outcomes are goals that may be envisioned for the first time, sustained from a present goal, or represent a desire to further a positive goal toward which one has already made progress. Negative goals on the other hand involve the forestalling or prevention of negative outcomes.

Lazarus (1999) wrote that “a fundamental condition of hope is that one’s current life circumstance is in some way unsatisfactory, involving some type of deprivation or is in some way damaging or threatening” (p. 654). Snyder (2002) suggested that hope can “repair” such deprivations by orienting goals toward filling voids in people’s lives.

Another key element of Snyder’s (2002) hope theory is that of agency thought. Specifically, he pointed out, that agency thought—the perceived capacity to use one’s pathways to reach desired goals—is the motivational component in hope theory. Hope arises in part from a strong desire to be in a different situation than one is currently in and from the impression that this is possible as a result of one’s efforts (Lazarus, 1999). This certainly implies that one has some degree of agency in attaining those goals. As Lazarus (1999) acknowledged, however, there also may be uncontrollable external forces that may have an impact on the attainment of goals. Nevertheless, the idea that one can act in a way that can help attain a goal is central to the emotion of hope.

2.12.2 Hope and health

Since hope is clearly related to the attainment of desired outcomes, the extent to which it can influence people’s health-related choices should be of interest. To begin, hope is positively linked to health (Nekolaichuk et al., 1999). Likewise, hope is an important aspect of mental health recovery (van Gestel-Timmermans, van den Bogaard, Brouwers, Herth, & van Nieuwenhuizen, 2009). Snyder, Feldman, Taylor, Schroeder, and Adams (2000) suggested that individuals with high levels of hope may use information about physical illness as a pathway for prevention arguments. In one study, high-hope women reported having stronger intentions to engage in cancer prevention behaviors (Snyder, 2002).

This raises questions germane to this research: Since hope appears to be related to positive health behaviors and may be desirable from a health communication perspective, can hope motivate? If so, can hope motivate to a greater degree than fear?

2.12.3 Trait hope vs. State Hope

In general, traits are enduring personality characteristics (Roberts, Walton, & Viechtbauer, 2006), whereas states are transient experiences that can change sometimes as quickly as moment to moment (Grawitch, 2013). Hope can be considered both a trait and a state (Schrank, Mag, Sibitz, & Lauber, 2010). Snyder, Harris et al. (1991) suggest that “hope is similar to optimism in that it is conceptualized as a stable cognitive set reflecting general rather than specific outcome expectancies” (p. 571). To measure trait hope, Snyder, Harris et al. (1991) developed the adult trait hope scale. The trait hope scale measures dispositional hope and consists of four agency items, four pathways items, and four distracter items. The scale has demonstrated internal reliability for both agency and pathway, and temporal reliability ranging from .85 for three weeks to .82 for ten weeks (Snyder et al., 2003).

On the other hand, Snyder, Sympson, Ybasco, Borders, Babyak, and Higgins (1996) indicated that state indices of hope, specifically agency and pathway components, may also be useful. They stated that people probably have dispositional hope that applies across situations and times, but that they also have state hope that reflects particular times and more proximal events (Snyder et al., 1996). To measure state hope, Snyder et al. (1996) developed a 6-item state hope scale. The state hope scale is a brief and well-validated measure of ongoing goal-directed thinking. Snyder et al. (1996) suggested that measuring the level of state hope in individuals at a given time can provide an indication of a person’s goal directed thinking at that moment which certainly has implications for health behaviors if a given health behavior can help a person achieve a goal.

In order to establish the utility of measuring state hope, Snyder et al. (1996) conducted an experiment and found that that presenting subjects with differing goal pursuits in which they either succeeded or failed at a given task did result in changes in post-test state hope scores such that success

on the task increased post-test state hope whereas failure reduced post-test state hope. This study established that state hope can be manipulated through the use of external stimuli.

Snyder et al. (1996) conducted another experiment to assess the predictive utility of state hope. The experiment found that state hope scores were positively correlated with the number of correct responses on a complex learning task. What this suggests is that higher state hope is related to better performance of a task. Although in this particular case the task was an academic exercise, it should be clear that higher levels of state hope could potentially lead to higher performance of other behaviors as well, such as health behaviors or even consideration of such behaviors, by increasing agentic thinking. Indeed, Snyder et al. (1996) agreed by suggesting that the state hope scale may be used in pre-post designs in which the focus is on changes in goal-directed thinking.

2.12.4 Why study hope in health decision-making?

It appears that there is evidence that inducing the emotion of hope in individuals has potential for increasing health related behaviors. But the literature has already established that other emotions, notably fear, can do the same thing. What is it about hope that makes it worth pursuing within the context of health decision making? It should be noted that proposing this question is not intended to suggest that levels of state hope should be optimized at every opportunity. Indeed, the literature has documented many cases where eliciting fear is appropriate and effective (Tannebaum, 2013). So the question becomes: Under what circumstances would increasing state hope become desirable and appropriate, and under what conditions would state hope be most effective at increasing the adoption of health behaviors? Unfortunately, there appears to be little in the literature that addresses this question. One of the aims of this dissertation is to add knowledge in that area.

The previous discussion has focused on the positive emotion of hope and the seemingly unexplored potential that this emotion may have in changing attitudes towards health behaviors and motivating individuals to adopt those behaviors. That is not to say that the presence of hope would increase the likelihood that any or even most health behaviors would be adopted. Thus, this dissertation

has chosen to focus on one particular type of behavior that may be influenced by the presence of these emotions in the individual: the decision to discuss genetic cancer screening with a health care provider. The willingness of individuals to overcome fears through the induction of hope in framed genetic screening appeals is likely to become an even more relevant issue in the near future as the field of genetics expands.

The rapidly expanding field of genetics and the human genome project bring with them the possibility that people will know more about their health risks and susceptibilities to diseases such as cancer. Knowing one's susceptibility to a catastrophic illness—knowing for example that one has a greater potential for getting cancer—could greatly impact that person's life. Fear of learning through genetic screening of personal susceptibility to a highly undesirable illness could lead an individual to simply choose not to undergo genetic testing. Some would argue that people are simply better off not knowing. If knowing about one's susceptibility could lead to early interventions that might greatly mitigate the impact of such illnesses, however, it might be beneficial to know.

Lazarus (1999) discussed how hope is often discussed within the context of the occurrence of a life threatening illness. He pointed out that in such situations: "we know we are in serious trouble, yet hope for a favorable outcome—for example, that the illness was misdiagnosed, can be successfully treated, or death and disability significantly delayed" (p. 654). In this case, it would appear that Lazarus was referring to people who had already been diagnosed with a catastrophic illness. Yet, I would argue that it would also be applicable to an individual who has just learned through genetic screening that they are susceptible to a catastrophic illness. In this case, however, the person has the time to act upon it. This is to some extent why genetic screening, in cases where it is warranted, can be of benefit to individuals. Further, because hope in general leads to the expectation of favorable outcomes, it is valuable to understand the role that state hope may play in the decision to seek out genetic testing. That is one of the questions this study intends to examine. But before moving on to the study itself, a

necessarily short overview of genetic testing for cancer is provided, as a full discussion of this topic would be well beyond the scope of this dissertation.

2.13 Genetic testing: An overview

According to the U.S. Library of Medicine:

Genetic testing is a type of medical test that identifies changes in chromosomes, genes, or proteins. The results of a genetic test can confirm or rule out a suspected genetic condition or help determine a person's chance of developing or passing on a genetic disorder. More than 1,000 genetic tests are currently in use, and more are being developed. (U.S. National Library of Medicine, 2014)

Genetic screening can be characterized in one of two general ways: first, genetic screening done in consultation with or as recommended by health care providers. And second, DTC, or “direct to consumer” genetic tests, that is genetic tests marketed specifically to consumers through mass media. Although there are many genetic tests available, it appears that relatively few of them are actually “recommended” by health care professionals. For example, the U.S. Preventive Services Task Force (USPSTF) recommends that primary care providers genetically screen women who have family members with breast, ovarian, tubal, or peritoneal cancer to determine if they are at increased risk for potentially harmful mutations (Moyer, 2014). Note, however, that the USPSTF does not recommend that people get these tests “on their own.” They recommend that genetic testing be conducted by physicians. Despite calls for genetic testing to be done under the supervision of health care professionals, many genetic tests are nevertheless directly marketed to individuals.

2.13.1 Direct to Consumer (DTC) Genetic Testing

Over the past decade there has been a dramatic rise in the availability of direct-to-consumer genetic tests (Gray, Hornik, Schwartz, & Armstrong, 2012). Considerable concerns exist within the medical community about various aspects of DTC genetic testing (Robson et al., 2010). First, questions can be raised about the utility of such tests. For example, a review by Ducournau, Gourraud, Rial-Sebbag, Cambon-Thomsen, and Bulle (2013) found that there were thirteen websites offering DTC

genetic tests for Alzheimer's disease. This is important since the predictive value of such tests, specifically for the more common late onset Alzheimer's disease, is questionable and not generally recommended (Atkins & Panegyres, 2011). On the other hand, it should be noted that those with a family history of the extremely rare early-onset Alzheimer's may benefit from genetic screening (Atkins & Panegyres, 2011). But again, early-onset Alzheimer's is very rare and is accompanied by a very specific genetic mutation that is highly associated with the onset of early Alzheimer's disease. Thus, such tests would be applicable to only a very small subset of the population who carry that gene. The genetic link to late-onset Alzheimer's is much less clear and thus genetic testing would not be recommended (Atkins & Panegyres, 2011). This calls into question the value of DTC genetic tests for late onset Alzheimer's disease.

Another concern about DTC tests is what people are able to ascertain from the results. The U.S. Government Accounting Office (GAO) for example reported that the results of some DTC genetic tests can be misleading at best and meaningless as worst (Nutrigenetic Testing: Tests Purchased, 2006). Even if the results of the tests are credible, the absence of professional medical opinion in interpreting genetic test results could potentially lead to misinterpretation of the results and perhaps to unwarranted fear. It is that fear that unscrupulous and profit-driven genetic testing companies can exploit to boost sales of their tests. For example, Myriad Genetics, provider of BRCA1 and BRCA 2 genetic screenings for breast cancer susceptibility, was criticized for exploiting public anxiety about breast cancer and misleading consumers into believing that all women need and should demand expensive genetic tests (Caplan, 2007; Williams-Jones, 2006). Tomes could certainly be written (and likely already have been) that discuss and debate the merits and pitfalls of DTC genetic testing; thus an extended discussion of such issues is well beyond the scope of this review. Suffice to say that DTC marketing of genetic screening is not without its concerns. This study, however, will focus on genetic screenings that are intended to take place under the guidance of a health care professional.

2.13.2 Genetic Screenings Recommended by Health Professionals

The list of genetic screenings recommended by health professionals appears to be relatively short when compared to the list of screenings available to consumers and in general appears to be limited to certain circumstances such as family history. The U.S. Preventive Services Task Force (USPSTF) recommended in 2005 and again in 2014 that women who have family members with breast, ovarian, tubal, or peritoneal cancer should be screened for an increased risk for potentially cancer causing mutations in breast cancer susceptibility genes (Moyer 2014; U.S. Preventive Services Task Force, 2005). The USPSTF also recommends that women with positive screening results should receive genetic counseling (Moyer, 2014). This again suggests that genetic screening for at-risk women should not occur in the absence of guidance by medical professionals. The American Society of Clinical Oncology (ASCO) agrees. They suggest that it is the role of oncologists and other health care providers to offer genetic tests in a clinical setting (Robson et al. 2010). Further, ASCO recommends that genetic testing only be offered when three criteria are met: the individual being tested has a personal or family history -that would suggest genetic cancer susceptibility, the genetic test can be adequately interpreted, and the test results have accepted clinical utility (American Society of Clinical Oncology, 2003). Regarding clinical utility, it would appear that a small number of genetic screenings fit this criterion.

Tests for mutations with high penetrance, which means that a high percentage of carriers ultimately get the disease, in appropriate populations have clinical utility (Robson & Offit, 2007). High clinical utility means that they inform clinical decision making and facilitate the prevention of or amelioration of adverse health outcomes (Robson & Offit, 2007). High penetrance gene mutations usually result in a significant alteration in the function of a corresponding gene and are associated with increases in cancer risk (Robson et al., 2010). Examples of genes with high penetrance mutations include BRCA 1 (breast cancer), MSH2 (colorectal cancer), APC (colorectal adenocarcinoma), and RET (medullary thyroid cancer), (Robson et al., 2010). Based on the above information, it appears that at this time, these are the only cancers for which genetic screening would be clinically useful. Considering the

annual toll these cancers take in human lives, advanced screening for susceptibility to these cancers would appear to have clinical value.

2.13.3 Promoting genetic testing

Is there a responsible way to promote genetic testing such that people who legitimately need it, actually obtain it? As previously indicated, there are potential ethical issues related to the promotion of DTC genetic screening tests. Likewise, health organizations such as USPSTF and ASCO make it very clear that genetic testing should not be a “do-it-yourself” proposition. Thus, from a health communication and health promotion standpoint, campaigns to encourage concerned people to obtain genetic screenings on their own would not be advisable. Yet there are clearly cases where genetic screenings for cancer are necessary and beneficial. If such tests should only be administered by health care professionals, then it would seem that the gateway for individuals to engage in this behavior would be to initially discuss the possibility of genetic testing with their health care providers. In other words, rather than promoting genetic testing per se, it would seem that a way to effectively and ethically communicate and promote genetic cancer screenings would be to promote the act of initiating conversations about genetic testing with health care providers. Thus, people with family history of cancer who have concerns about their susceptibility for cancer should inform their doctors of their family history and then initiate dialog regarding genetic screening. Communication campaigns about genetic screening could therefore focus on promoting conversations with health care providers about genetic testing for at risk individuals rather than promoting the act of genetic screening itself. For the purposes of this study, willingness on the part of study participants, all of whom will have a self-reported history of breast, ovarian, colon, thyroid, or peritoneal cancer, to initiate conversations with their health care providers about genetic screening will be one of the outcome measures and will be used as the target behavior in experimental promotion materials.

As the science of genetics continues to advance, it is possible that other clinically viable genetic tests will be developed. Even if more clinically viable tests are developed, however, it is difficult to

imagine that health care professionals would advise their use in the absence of consultation. Therefore, there is considerable utility in understanding how to best promote the act of initiating dialogue with health care providers about genetic screening particularly when screening may result in undesirable findings. This study will examine how fear and hope can influence the persuasiveness of those type of appeals. Before moving on to the overview of the hypotheses and research questions, however, is it important to establish what this research will contribute to the literature.

2.14 What will this study contribute to the literature?

This study will examine how discrete emotions, specifically fear and hope, mediate the relationship between message frame and attitude toward genetic cancer screening and identify which emotion is more effective at persuading people to discuss genetic screening with their doctors.

From the existing literature, it is evident that the persuasiveness of gain and loss framed appeals varies according to many different factors. This literature review has examined the various factors that have been shown to influence the persuasiveness of message frames. Factors have included those that relate to the health behavior itself such as the frequency or type of health behavior (disease prevention vs. disease detection). Other factors relate to the individual characteristics of the person performing the behavior such as demographic factors, individual perceptions, and beliefs. What appears to be somewhat lacking in framing literature are studies examining how emotions may mediate the relationship between message frame and outcome

It has been pointed out previously in this literature review that under certain circumstances, fear and fear appeals are effective at changing behaviors and persuading people to adopt health behaviors. What is unclear to some extent is the role that fear and other discrete emotions, especially positive emotions such as hope, may play in the relationship between message frame and attitude toward genetic cancer screening. What this study will contribute to the literature is an initial inquiry into the potential for discrete emotions to mediate the effectiveness of framed health appeals and the extent to which fear and hope each do so. Understanding more about the conditions under which certain type so appeals are

more effective can help message creators design appeals that can result in positive attitudes toward health behaviors and to ultimately influence health behavior.

2.14.1 Practical implications

This study will also have important practical applications. To begin, there may well come a day when routine genetic screening for cancer is as widespread and recommended as the annual flu shot. That day is not yet here, but the day is here when those at elevated risk for cancer due to genetic predisposition can discuss with their doctor the options available to help them better manage their risk via genetic screening. This is precisely why it is important to study which emotions can enhance health appeals for genetic screening. In the future, there are likely to be other clinically viable genetic tests for many other terrible conditions and diseases where knowing the genetic predisposition can lead to interventions designed to mitigate the risks. Understanding how to promote them now may be of great value when that day arrives. It may also teach us how to better promote the potentially beneficial genetic screenings to at-risk individuals today.

2.15 The current study

In this study, I will examine the extent to which discrete emotions, specifically fear and hope, mediate the influence of public service announcements advocating talking to a health care provider about genetic cancer screening. Although much of the relevant framing literature has focused broadly on gain- versus loss-framed messages, it has been argued that in a health context it would be useful to explicitly examine the use of fear-based versus hope-based appeals as frames. I will first examine the overall effectiveness of a fear-framed message vs. a hope-framed message, compared to a control group. The focus of this study will be on how fear-framed and hope-framed PSAs differentially influence attitudes toward genetic cancer screening and intent to seek counsel about screening from a health care provider, and the extent to which emotion mediates the effect of frame on attitudes. Participation will be limited to those with prior family history of cancer. Participants will be randomly assigned to one of

three experimental groups. One group will view a fear-framed message that advocates talking with a health care provider about genetic cancer screening and the other group will view a hope-framed message about the same topic. Both messages will be presented in the form of a video public service announcement. A control group will watch an unrelated message. Analysis will examine whether fear and/or hope mediate the influence of the appeals for genetic screening on attitudes toward the behavior. It will also reveal which emotion in general is more persuasive.

It has been shown that discrete emotions can interact with messages to affect behavior. Gerend and Maner (2011) for example explored the question of whether the success of a framed message depended upon the emotional state of a message recipient. They found that responses to framed messages do vary as a function of people's current emotional state and specifically that fearful people were more responsive to a loss-framed message (Gerend & Maner, 2011). In their study, however, they induced the emotional state before exposing them to a message so they were already in an emotional state when they encountered the messages. While theirs is an interesting and useful finding, its applicability outside of a laboratory controlled experiment may be limited. In practice, it would be difficult to ascertain what emotions a person is feeling prior to reading a health message. In addition, those findings do not take into account emotions that may be aroused by the message itself. Knowing what emotions a framed message aroused and whether those emotions mediated the persuasiveness of the message would extend the research of Gerend and Maner (2011) and advance framing theory. In addition, recent work by Nabi and Prestin (2016) found that both hope and fear can interact with response efficacy to increase behavioral intent to adopt health protection behaviors (HPV prevention). However, this study will examine how these emotions work within a framing model to influence intent toward a health detection behavior (discussing genetic screening with a health care provider).

As previously indicated, this study will examine which type of emotional appeal results in a more positive attitude toward genetic cancer screening. It will examine the extent to which each appeal stimulates two discrete emotions, fear and hope. The study will then turn its focus to whether these

discrete emotions mediate the effectiveness of the appeal and how it affects attitude toward genetic cancer screening and intent to discuss screening with a health care provider. Notably, this study will examine two discrete emotions that are dimensionally opposite. That is, fear is widely regarded as a “negative” emotion dimensionally, while hope is regarded as a “positive” emotion. This study is also unique in that it will examine appeals for a disease detection behavior that has received little attention in terms of framing studies—genetic cancer screening—a type of behavior surely to become more and more frequent as the capacity to conduct genetic screening continues to expand.

2.16 Hypotheses

This study first examines overall effectiveness of a fear-framed message vs. a hope-framed message, compared to a control group. Since the framed messages were specifically designed to elicit certain emotions, it is reasonable to expect that the fear-framed message would result in a higher level of fear than would the hope-framed message or the control message. Therefore, I predict:

H_1 = The fear-framed PSA will result in higher levels of fear than (a) the control message and (b) the hope-framed PSA.

Likewise, it would be expected that the hope-framed PSA would result in higher levels of hope than either the fear-framed PSA or the control group PSA. Therefore, I predict:

H_2 = The hope-framed PSA will result in higher levels of hope than (a) the control message and (b) the fear-framed PSA.

Similarly, it would be expected that those who actually watch one of the framed messages discussing genetic cancer screening and the importance of talking to a health care provider about genetic cancer screening would be more likely to have a better attitude toward genetic cancer screening and would be more likely to discuss it with a health care provider than those who did not watch one of the framed messages. Overall, I predict:

H₃= Compared to the unrelated control group message, the fear-framed message and the hope-framed message will (a) result in more positive attitudes toward genetic cancer screening, and (b) result in greater intention to get screened.

2.17 Model of the influence of frame on attitude toward genetic cancer screening and intent to discuss with a health care provider

This study focuses on how fear-framed versus hope-framed PSAs differentially influence attitudes toward genetic cancer screening and intent to seek counsel about screening from a health care provider, and the extent to which emotion mediates the effect of frame on attitudes. First, a basic model of the influence of frame on attitude and behavioral intent, and the mediating influence of attitude toward genetic cancer screening, will be examined. This model is presented in Figure 1.

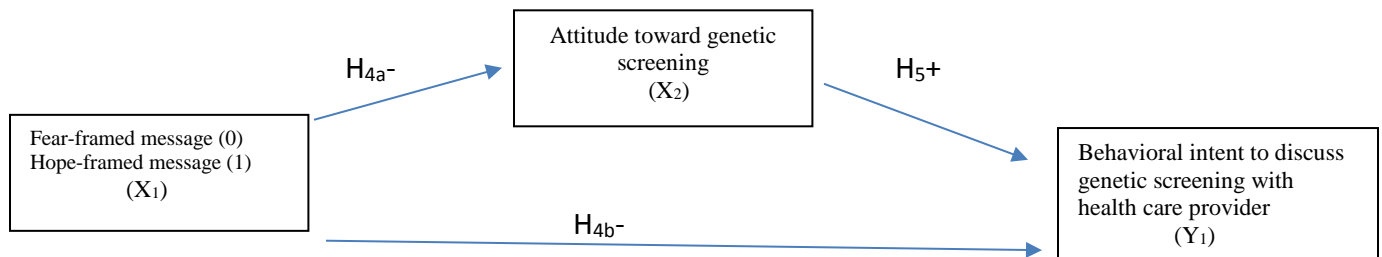


Figure 1. Model of the influence of frame on attitude toward genetic cancer screening and intent to discuss with a health care provider. H₆ predicts that attitude will mediate the influence of frame on intent to discuss.

Previous findings from the framing literature support the notion that loss-framed messages are more effective than gain-framed messages at motivating people to adopt health-detection behaviors. Citing the work of Kahneman and Tversky (1981), O'Keefe and Jensen argued that when the outcome of a health behavior is not known or uncertain, people are more responsive to a loss-framed message that highlights the consequences of not adopting the behavior (O'Keefe & Jensen, 2006). As argued above, genetic cancer screening is a type of health detection behavior for which the outcome is uncertain. An

analysis of framing studies by Rothman and Salovey (1997), Salovey, Schneider, and Apanovitch (2002), and Van 'T Riet, Ruiters, Werjij and DeFries (2010), suggest that loss-framed messages would be more persuasive than gain-framed messages for disease detection behaviors. It can be argued that in general, a fear-framed message is somewhat analogous to a loss-framed message in that it accentuates the consequences of not engaging in a behavior. Much the same way, a hope-framed message might be considered analogous to a gain-framed message in that it accentuates the desirable outcomes of engaging in a behavior.

In this study, the primary research question is concerned with what type of appeal message (hope or fear) is more persuasive at increasing intent to talk to a health care provider about genetic cancer screening. Consistent with evidence suggesting loss-framed messages, and therefore “negative” appeals, are generally more persuasive for disease detection behaviors, I predict:

H₄: Compared to the hope-framed message, the fear-framed message will result in (a) a more positive attitude toward genetic cancer screening and (b) greater intent to discuss genetic cancer screening with a health care provider.

As previously indicated, message frames are often utilized in appeals to persuade people to have favorable attitudes toward a health behavior. Likewise, attitudes can affect behavioral intention (Shen & Dillard, 2007) and ultimately behavioral adoption. Therefore, it is reasonable to propose that in general, if people have a positive attitude toward a health behavior, they may be inclined to adopt the behavior. Therefore, I propose a direct influence of attitude toward genetic cancer screening on intent to discuss genetic cancer screening:

H₅: Respondents' attitude toward genetic cancer screening will be positively associated with intent to discuss genetic screening with their health care provider.

In addition to having a direct effect on intent, attitude could also mediate the relationship between message frame and behavioral intent. In such a relationship, message frame would have an indirect influence on behavioral intent through attitude.

In general, mediation is a “chain of relations where an antecedent variable affects a mediating variable which then affects the outcome variable” (MacKinnon, Fairchild, & Fritz, 2007, p. 1). In other words, they argued, the mediating variable transmits the effect from independent variable to dependent variable (MacKinnon et al., 2007). A variable is a mediator when it accounts for the relationship between an independent variable and an outcome variable (Baron & Kenny, 1986). According to Baron and Kenny (1986) variations in the independent variable account for variations in the mediating variable and variations in the mediator variable then account for variations in the outcome variable. Therefore, mediation happens when a third variable (a mediator) is added to an $X \rightarrow Y$ relationship such that the mediator M lies between X and Y and influences that relationship (MacKinnon et al., 2007).

Therefore, I propose that the influence of message frame on intent to discuss genetic cancer screening is mediated by attitude toward genetic screening:

H₆: Attitude toward genetic cancer screening will mediate the influence of frame on intent to discuss genetic cancer screening with their health care provider

2.18 Message Mediation by Emotion

This study proposes that discrete emotions mediate the relationship between emotional health appeals and attitude. I propose a model in which fear and hope partially mediate the relationship between the health appeal message and attitude toward genetic cancer screening. This model proposes that fear and hope act as mediating variables but to different extents suggesting that the use of one type of message, in this case fear-framed message, is more persuasive.

In this model, a framed message elicits the emotions fear and hope, each of which then act as a mediator resulting in differentially positive attitudes toward genetic cancer screening, with attitude ultimately influencing behavioral intent to discuss screening with a health care provider (HCP). Figure 2 contains the model for the mediation of emotional appeal by fear and hope.

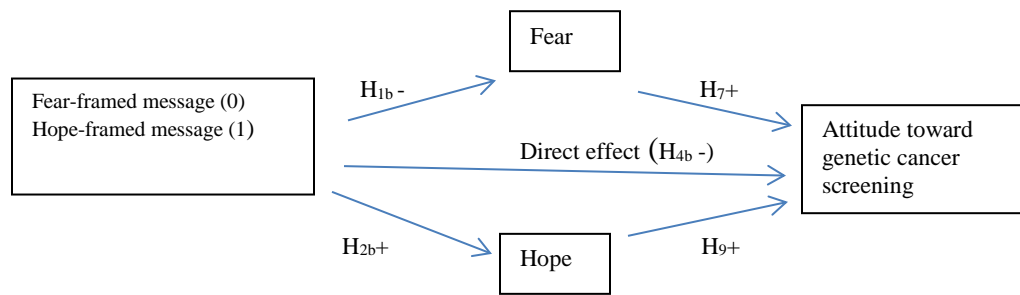


Figure 2. Model of mediation of emotional appeal by fear and hope. H_8 predicts that fear will partially mediate the relationship between message frame and attitude toward genetic cancer screening. H_{10} predicts that hope will partially mediate the relationship between message frame and attitude toward genetic cancer screening.

2.18.1 Message mediation by fear

In the model in Figure 2, fear acts as a mediator between message frame and attitude toward genetic cancer screening. This model proposes that the mediating variable of fear partially transmits the effect of message frame on attitude.

As previously stated, mediation requires that a variable, known as a mediator, (partially) account for the relation between an independent variable and an outcome variable (Baron & Kenny, 1986). Consistent with this understanding of mediation, the mediation model presented in Figure 2 predicts that the framed emotional appeal (the independent variable) will influence fear, which will partially account for the positive effect of the framed appeal on attitude toward genetic cancer screening (outcome variable). Thus, this model requires the elicitation of fear. A fear-framed message about genetic cancer screening may elicit multiple emotions, however, including both hope and fear, but to differing degrees. As mentioned earlier, it was predicted (H_{1b}) that the fear-framed message would elicit more fear than would the hope-framed message. This is because fear derives from events, conditions or situations that signal danger or threat (Izard, 1977). Certainly, it can be argued that a fear-framed message does just that.

Once fear has been elicited by a message, I propose that it serves at the catalyst for a positive attitude toward genetic screening (Shen & Dillard, 2007). In other words, how someone feels about a given behavior—their attitude—is influenced by emotion, which suggests that emotions may play a

mediating role. Previously, I predicted that the fear-framed message would lead to a more positive attitude toward genetic cancer screening than would the hope-framed message (H_{4b}). In addition, it was expected that the emotion of fear would mediate the expected influence of the framed message on attitude. Therefore, I predict:

H₇: Fear will be positively associated with attitude toward genetic cancer screening.

H₈: Fear will partially mediate the influence of the framed message on attitude toward genetic cancer screening.

2.18.2 Message mediation by hope

As previously stated, it is reasonable to expect that viewing either a fear-framed message or a hope-framed message may elicit more than one single emotion and I have suggested the possibility that both appeals, fear and hope, can lead to the elicitation of both emotions (among others, to be sure). Figure 2 above shows the expected partial mediation of emotional appeal by hope. In this model, the effect of message frame is partially transmitted by the mediating variable of hope to attitude toward genetic cancer screening.

It was previously predicted (H_{2b}) that the elicitation of hope would be expected to be associated more with the hope-framed message. Lazarus (1999) explained that hope “requires a belief in the possibility of a favorable outcome” (p. 665). Likewise, Staats and Stassen (1985) suggested that hope consists of a cognitive element leading to the expectation of a positive outcome. In the case of this study, the hope-framed message will emphasize the outcome of talking about genetic cancer screening as a “positive outcome” (e.g. the opportunity to help prevent the onset of cancer in oneself). Hence, it follows that the hope-framed message will lead to a greater level of hope relative to the fear-framed message and will be positively related to attitude toward genetic screening.

Just as fear has been shown to lead to a positive attitude toward health behaviors, I suggest that hope can as well. In other words, although overall, the fear-framed message was expected to lead to a more positive attitude toward genetic cancer screening than the hope-framed message, it was

nonetheless expected that the emotions of fear and hope would both be associated with more positive attitudes. We certainly know that hope underscores the inclination to act. Stotland (1969) for example wrote that “hope is a necessary condition for action” (p. 7). That said, Nabi and Keblusek (2014) pointed out that because hope is “associated with an uncertain degree of uncertainty about the future” (p. 215), there may actually be doubt about whether or not the desired outcome will occur. In other words, one may hope that genetic screening will result in a finding of no increased susceptibility to cancer but that is not guaranteed.

That said, it should not be assumed that the strength of the positive attitude toward genetic cancer screening would be the same for both fear and hope. Nabi and Keblusek (2014) for example found one negative emotion (envy) more strongly associated with behavioral motivation than hope suggesting in this case that the negative emotion was more motivational than the positive emotion. These findings are consistent with others who have asserted that positive emotions may not be as strong a motivator as negative emotions (van de Ven, Zeelenberg, & Pieters, 2011). So while I have acknowledged that hope may also mediate the relationship between frame and attitude just as I have proposed fear does, it is more likely that hope does so to a lesser extent than fear. Therefore, I predict that:

H₉: Hope will be positively associated attitude toward genetic cancer screening.

H₁₀: Hope will partially mediate the relationship between frame and attitude, but will be a weaker mediator than fear.

3 PILOT TESTS

3.1 Study overview

Overall, the objective of this research is to examine how discrete emotions, specifically fear and hope, mediate the relationship between framed health messages and attitude toward genetic cancer screening and behavioral intent to discuss genetic cancer screening with a health care provider, and to

explore the differential effectiveness of fear and hope-framed messages. Participants in this study viewed one of two public service announcements (PSAs)—either a fear-framed or a hope-framed PSA—promoting the importance of discussing genetic cancer screening with a health care provider. The PSAs were created specifically for this study. A control group viewed an unrelated PSA.

The study consisted of three phases. Phase I consisted of development, pilot testing, and revision of the initial PSA scripts. Phase II consisted of production and pilot testing of the PSAs. Phase III consisted of the main study where participants viewed the PSAs and answered a series of questions. This chapter will report the results of the Phase I and Phase II pilot tests.

3.2 Phase I: Development and pilot testing of PSA scripts

In order to examine how emotions mediate the response between a framed health message and attitude toward genetic screening, it was necessary to create framed messages that would elicit the emotions of hope and fear. The initial study proposal specified that the framed messages would be written messages such as brochures or pamphlets containing information about the importance of talking to a health care provider about genetic cancer screening. There was some concern, however, that written messages would not elicit sufficient emotional responses from research participants. It was therefore decided to use a video format, specifically a video public service announcement (PSA) to convey the framed health appeals.

Public service announcements (PSAs) attempt to persuade by evoking emotional responses in the audience (Dillard & Peck, 2000). Quite often, the emotion evoked in PSAs is fear. A content analysis of AIDS PSAs for example revealed that 39% of the messages were structured as fear appeals. (Freimuth, Hammond, Edgar, & Monahan, 1990). PSAs can incorporate dramatic production techniques such as music, dramatic camera angles and lighting, and spoken dialog to convey the importance and or consequences of not adopting the behaviors.

Before producing the public service announcements, two draft scripts (See Appendix A) were written. One contained a fear-framed message and one contained a hope-framed message promoting

talking to a health care provider about the importance of genetic screening for those at higher risk of cancer.

In general, the fear-framed PSA was designed as a classic fear appeal. As previously discussed, fear appeals are persuasive messages designed to scare people by describing the terrible things that will happen to them if they do not do what the message recommends (Witte, 1992a). In this case, the fear appeal PSA would clearly imply that not discussing genetic screening with a doctor would lead to unfavorable outcomes. Thus, it was deliberate attempt to “show the terrible consequences” of not adopting the behavior in the message. But merely inciting fear may not be sufficient to induce people to consider adopting the promoted behavior. It has been pointed out for example, that for fear appeals to be more effective they should contain information that will lead to better response efficacy, that is, provide people with information they can use to reduce the threat (Bastien, 2011). Therefore, the PSA would also contain very specific guidance for viewers who have a family history of cancer—that they should talk to their doctors about genetic cancer screening.

The intent behind the hope video was to create a “hope appeal,” that is a message that shows the positive outcome of adopting the behavior. The hope video would contain precisely the same information about the health behavior, but would frame it entirely differently using both a combination of different narration and film editing techniques to elicit hope rather than fear. As discussed in the literature review section of this paper, much less is known about the effectiveness of positive emotional appeals in health messaging.

Each of the draft scripts—the fear framed PSA script and the hope-framed PSA script—were pilot-tested in a series of focus groups prior to PSA production. The pre-production focus group questions and survey questions can be found in Appendix B.

Participants for the pilot test focus groups were recruited from undergraduate communication courses at Georgia State University and from a local church senior group. See Appendix C and Appendix D for the recruitment message and Consent Form. A total of three focus groups were

conducted. Two focus groups were held for the fear framed message ($n = 16$) and one for the hope message ($n = 13$).

3.2.1 Participants

A total of 29 people participated in the three pilot test focus groups. The age of the participants ranged from 19 to 81 years of age ($M = 56$, $SD = 24.3$). Twenty four respondents (82.7%) were female, 5 (17.2%) were male. The ethnicities of these participants were as follows: 14 (48.3%) were white, 6 (20.6%) were Black / African-American, 4 (13.7%) were Hispanic / Latino(a), 3(10.3%) were East Asian / Pacific Islander, 2 (6.9%) were Native American Two individuals identified as both Black / African American and Native American.

It should be noted that there was a considerable difference in the average age of the different focus groups. The sole focus group conducted at Georgia State (fear message) consisted of Georgia State Undergraduate Students with a mean age of 20 years. On average, this group was much younger than the members of the focus groups held at the local church. These latter groups consisted of members of the church's senior group. The average age of the second group of focus group participants was approximately 71 years. Due to time and resource constraints, however, it was not possible to recruit additional focus group participants.

3.2.2 Procedure

Initially, focus group participants were recruited from Georgia State University Communication undergraduate students. A total of four focus groups were scheduled at Georgia State. The intent was to conduct two focus groups of approximately 6-8 participants for each of the scripts. Only 2 participants reported for each of the hope message focus groups which did not meet the minimum number of participants for a focus group. Their responses were not included in the focus group analysis. Likewise, one of the fear message focus groups had only a single participant, which also did not meet the minimum requirement. Their response was not included in the pilot test analysis. The second fear

message focus group, however, included 8 participants which was sufficient for a focus group. This group's responses were counted in the analysis. This focus group was moderated by a single moderator (the student researcher) in a conference room at Georgia State University.

In summary, only one of the four focus groups scheduled at Georgia State had enough participants to be considered a focus group. This one focus group with a sufficient number of respondents ($n = 8$), which read the fear PSA scripts, was included in the focus group analysis. The responses from the other scheduled focus groups that had only one or two participants were not included.

Because recruiting at Georgia State did not yield enough participants for the pilot test, additional focus group participants were recruited from a local church. A total of 21 participants were recruited from a senior social group at a local church. These participants were divided into two focus groups which were conducted simultaneously in a large fellowship hall separated by a divider. There were two moderators present for this session, the student researcher and a female colleague. One moderator was assigned to each focus group. The focus groups read either the fear-framed script ($n = 8$) or the hope-framed script ($n=13$). More participants were assigned to the hope focus group in this setting due to the lack of respondents in the first focus groups at Georgia State. Likewise, because of time and resource constraints, it was not possible to divide the hope-framed focus group participants into two smaller groups, therefore one large focus group of 13 was conducted for the hope script. The use of a second moderator (i.e., not the student researcher) and the size of the hope focus group (13 rather than 6-8) deviated from the research protocol approved by the GSU IRB. Accordingly, a Protocol Deviation Form was submitted to the IRB [and was accepted].

Focus group participants first read the scripts and discussed them with the moderator who asked a series of questions about their impressions of the script. The focus group at Georgia State was audio recorded. The focus groups at the church were not recorded but extensive notes were taken. At the conclusion of the focus group discussions, participants completed a short survey asking them to rate the

extent to which the scripts elicited certain emotions on a 5-point scale ranging from (0 = none of this feeling to 4 a lot of this feeling). As noted above, the focus group questions and survey can be found in Appendix B.

3.2.3 *Results: pilot test focus groups*

The qualitative responses indicated that in general, respondents were able to distinguish the positive and negative aspects of the different messages. Specifically, those reading the hope message were able to ascertain that the message contained a more positive tone. For example, in response to the question asking: “What are your perceptions of the message? Anything positive or negative?” Responses from the hope group indicated that they perceived the positive tone of the message. Their comments included:

Don't be afraid to get tested (church focus group member, hope script)

There is hope, [if you are at risk] there is something you can do about it (church focus group member, hope script)

Similarly, those in the fear focus groups were able to perceive the negative tone of the messages, although they were also critical of some of the imagery used in the fear script (e.g. the initial script contained an image of a graveyard which was meant to imply that people who didn't discuss genetic screening might end up there).

[Message] stressed the severity of not being screened (Georgia State Focus group member, fear script)

The graveyard scene was too abrupt, seemed thrown in, it didn't work (Georgia State focus group member, fear script)

The qualitative responses of the focus groups indicated that most participants understood the importance of talking to a doctor about genetic cancer screening and that it targeted those with a family

history of cancer, which were the main messages the scripts were attempting to convey. Comments included:

[Message] would prompt me to check into my family history (church focus group member, hope group)

[Message] would make me check to see if I have a high risk of cancer (GSU focus group member fear group)

Some respondents, however, thought the messages focused more on genetic cancer screening itself as opposed to talking to a doctor about genetic cancer screening. In other words, some people did not make the critical distinction between talking to a doctor about genetic cancer screening and genetic cancer screening itself.

The message made me aware of genetic screening (Focus group participant from Georgia State, fear script)

It did bring the idea of genetic screening into my head (Church focus group member, hope script)

Some participants felt the messages themselves were not strong in that they seemed to lack an “emotional punch”:

It was too soft of a message (church focus group, hope script)

The subject was interesting but the set up wasn't all that interesting. The narrative wasn't compelling (GSU focus group, fear group)

Additionally, a number of focus group participants also pointed out that the PSA scripts should provide more detail about how to access genetic screening. Apparently they did not effectively convey the importance of talking to a doctor about genetic screening:

Need to add information about how to access genetic screening (church focus group member, hope group)

These comments suggested that some revisions of both of the draft PSA scripts were necessary.

As previously indicated, participants completed a survey following the focus group where they answered questions about the extent to which the scripts conveyed various emotions. These results are summarized in Table 1.

Table 1 Emotional Responses to Pilot Test Scripts

Emotions	Fear framed script		Hope framed script		t-tests		
	Mean	SD	Mean	SD	t value	df	p value
Key Emotions Related to Manipulation							
Fear	1.60	1.5	1.62	1.66	.026	26	.980
Worry	2.31	1.62	1.62	1.66	-1.14	27	.265
Hope	2.19	1.33	2.15	1.63	-.061	27	.951
Additional Emotions							
Sadness	1.75	1.34	1.54	1.76	-.367	27	.716
Anger	.56	1.09	.85	1.52	.584	27	.564
Courage	1.31	1.54	1.62	1.5	.533	27	.598
Happiness	1.25	1.34	1.38	1.33	.270	27	.789
Confusion	.81	.83	.77	1.36	-.105	27	.917
N	16		13				

Note. Emotion ratings could range from 0 to 4.

The primary emotions of interest in this study are hope and fear. There was no significant difference in the focus groups' perception of hope ($p = .951$) or fear ($p = .980$) which may suggest that the initial messages did not differentially elicit the desired emotional responses. This may also suggest that the initial PSA scripts should be revised so that the fear message would elicit more fear and the hope message would elicit more hope which is consistent with focus group responses indicating that the messages lacked a strong emotional appeal.

3.3 Phase II: Production and Pilot testing of Public Service Announcements (PSAs)

At the completion of the pilot test focus groups, the scripts were revised based upon both the quantitative and qualitative data obtained. Most notably, a prologue and an epilogue sequence was added to each script that clearly showed either the consequences of not adopting the behavior (fear framed message) or the benefits of adopting the behavior (hope framed message). This element was missing from the initial scripts which may have contributed to the respondents not perceiving high levels /of fear or hope conveyed by the messages. Once the revisions to the scripts were incorporated, two separate public service announcements (PSAs), each approximately two minutes in length, was produced using a locally-recruited cast and production crew. One PSA contained a fear-framed message and the other a hope-framed message.

3.3.1 Participants

After PSA production, a sample of 38 undergraduate students from Georgia State University communication courses were recruited to view one of the final videos online. See Appendix E and Appendix F for the recruitment message and Consent Form. Students were awarded extra credit for participation in the form of 0.5 percent of the total points available in the course. Twenty respondents (52.6%) were female, 13 (34.2%) were male, and there were 5 not reporting (13.2%). The age of the participants ranged from 18 to 43 years of age ($M = 20.8$, $SD = 4.4$). Eighteen respondents (47.4%) were African-American, 11 (28.9%) were White / Caucasian, 6 (15.8%) and were East Asian / Pacific Islander, 2 (5.3%) were Hispanic / Latino. Two of these respondents selected more than one race: One participant identified as both Black / African American and East Asian Pacific Islander, and one identified as both East Asian Pacific Islander and White Caucasian.

3.3.2 Procedure

The students were randomly assigned to watch either the fear-framed PSA ($n = 22$) or the hope framed PSA ($n = 16$) and answer a short survey which can be found in Appendix G. The survey

consisted of questions about the perceived frames, emotional responses, and effectiveness of the messages. After watching the video, participants rated four items that assessed the extent to which they believed the message addressed gains/losses and advantages/disadvantages. These items were rated on a 7-point scale from 0 = strongly disagree to 6 = strongly agree. They also rated the emotions they felt were conveyed by the messages, including fear, worry, hope, sadness, anger, courage, happiness, and confusion. The emotions were rated on a 7-point scale from 0 = none of this feeling to 6 = a lot of this feeling. Finally, they rated the message on a series of characteristics (e.g., interest, attention, credibility) on which the messages should not differ, using a 7-point scale (0 = strongly disagree to 6 = strongly agree). A summary of the findings is contained in Tables 2, 3, and 4 below.

3.3.3 Results of Phase II pilot test

A total of 33 respondents completed the survey: 20 of the fear group respondents completed the survey and 13 of the hope group participants completed the survey. In the first set of items, participants rated the extent to which they believed the messages addressed gains/losses and advantages/disadvantages. As expected, the findings indicate that the fear-framed PSA was significantly more effective than the hope-framed PSA at conveying the loss of important health benefits ($p = .035$) and stressing the disadvantages of not discussing genetic cancer screening with a doctor ($p = .031$). There was no significant difference between the PSAs in terms of how respondents perceived the gains and advantages of talking to a doctor about genetic cancer screening. Table 2 summarizes the perception of the extent to which the PSAs conveyed the gains and losses and advantages and disadvantages associated with either adopting or not adopting the behavior.

Table 2 Perceived Inclusion of Gain/Loss and Advantages/Disadvantages in the Messages

Items	Fear PSA		Hope PSA		t-tests		
	Mean	SD	Mean	SD	t value	df	p value
According to this message, I will gain important health benefits if I talk to my doctor about genetic cancer screening.	5.25	1.29	4.92	.954	.782	31	.440
According to this message, I will lose important health benefits if I don't talk to my doctor about genetic cancer screening.	4.75	1.29	3.62	1.66	2.20	31	.035
This message emphasized the advantages of talking to my doctor about genetic cancer screening.	5.05	1.09	5.23	.927	-.490	31	.628
This message emphasized the disadvantages of not talking to my doctor about genetic cancer screening.	4.45	1.43	3.08	2.06	2.26	31	.031
n	20		13				

Note. Ratings could range from 0 to 6.

In the second set of items, respondents were asked to rate the extent to which the PSAs elicited eight different emotions. The primary emotions of interest were fear, worry, and hope. It was expected that the fear PSA would lead to significantly higher levels of fear and worry and that the hope-framed PSA would lead to significantly higher levels of hope. These expectations were partially confirmed.

The results summarized in Table 3 indicate that the fear-framed PSA elicited a significantly higher level of worry than the hope-framed PSA, $t(31) = 2.53, p = .017$, but that the fear-framed PSA did not elicit a significantly higher amount of fear than the hope PSA, $t(31) = 1.28, (p = .209)$. The difference in the level of hope elicited by the fear-framed vs. hope-framed PSA was substantial (fear PSA, $M = 2.84$; hope PSA, $M = 3.92$), although it did not quite approach significance $t(30) = -1.58, (p = .130)$, possibly due to the small sample size.

Other emotions that were analyzed in the pilot test included, sadness, anger, courage, happiness, and confusion. The only significant difference found among these emotions was for sadness with the fear PSA eliciting a significantly higher level of sadness than the hope PSA which is not surprising.

Table 3 Perceived Emotions Conveyed by the Messages

Emotions	Fear PSA		Hope PSA		t-tests		
	Mean	SD	Mean	SD	t value	df	p value
Key Emotions Related to Manipulation							
Fear	2.90	1.86	2.08	1.71	1.28	31	.209
Worry	3.65	1.90	1.92	1.94	2.53	31	.017
Hope	2.84	2.12	3.92	1.61	-1.58	30	.130
Additional Emotions							
Sadness	3.50	1.79	2.08	1.98	2.14	31	.040
Anger	1.89	2.13	.77	1.36	1.68	30	.104
Courage	2.74	2.18	2.83	1.53	-.134	29	.895
Happiness	2.05	2.21	2.31	1.55	-.365	31	.718
Confusion	1.70	1.49	1.23	1.74	.828	31	.414
n	20		13				

Note. Emotion ratings could range from 0 to 6.

In the third and final set of items, respondents were asked about their evaluations of the PSAs. The results are summarized in Table 4. As expected, there were no significant differences found on any of the items suggesting that the PSAs were perceived similarly in these dimensions.

Table 4 Perceived Effectiveness of the Messages

Items	Fear PSA		Hope PSA		t-tests		
	Mean	SD	Mean	SD	t value	df	p value
Overall, I liked this ad.	3.9	1.37	3.77	1.79	.237	31	.814
The ad was interesting.	3.65	1.63	3.46	1.85	.307	31	.761
This ad was easy to understand.	4.95	.999	4.69	1.80	.530	31	.600
I would pay attention to this ad if I saw it again.	3.65	1.95	3.77	1.83	-.175	31	.862
I am interested in this ad's topic.	3.75	1.77	4.31	1.65	-.906	31	.372
I like the way the ad looks.	3.65	2.06	3.46	1.98	.261	31	.796
I can do what the ad suggests.	4.30	1.42	4.17	1.64	.243	30	.810
The ad was convincing.	4.10	1.59	4.00	1.68	.173	31	.864
The ad grabbed my attention.	3.75	1.77	3.38	1.66	.593	31	.558
The ad was confusing.	1.58	1.92	1.85	2.58	-.336	30	.739
The message was credible.	3.90	1.45	4.23	1.69	-.600	31	.553
The message was persuasive.	4.05	1.50	3.54	1.71	.904	31	.373
n	20		13				

Note. Ratings could range from 0 to 6.

3.3.4 Conclusion

The results of the second pilot test indicate that the perception of the disadvantages and losses associated with not discussing genetic cancer screening with a doctor were significantly higher among those who saw fear-framed PSA than those who saw the hope-framed PSA. This would suggest that the fear PSA successfully manipulated the negative perceptions associated with the fear framing. Likewise, it should also be noted that the fear PSA also resulted in significantly higher levels of worry and sadness than the hope PSA. Although neither of these emotions is the focus of this study, these findings suggest

that the fear PSA elicited higher levels of these “negative” emotions. Overall, however, the second pilot test also determined that there was a lack of statistical difference in the levels of hope and fear elicited by the public service announcements (i.e. the hope message did not elicit a significantly higher level of hope than the fear message did; the fear message did not elicit a significantly higher level of fear than the hope message did). However, the mean differences were in the expected direction. It could be argued that the lack of significance can partly be attributed to the very small sample size. It was expected that the larger sample size in the main study would push these findings closer to significance. It should also be noted, however, that considerable effort and resources were utilized in the production of the two public service announcements and it was therefore not feasible to attempt to revise them after the second pilot test.

4 METHOD: MAIN STUDY

4.1 Participants

Individuals aged eighteen years and older were recruited from the general population through Mechanical Turk (MTurk). Participation in the actual study was limited to those with a family history of breast, cervical, ovarian, peritoneal, colon, or thyroid cancers who had not yet been genetically screened for cancer susceptibility or had not talked to their health care provider about genetic screening. Participants must also not have previously been diagnosed with any of the aforementioned types of cancer. See Appendix H and Appendix I for the recruitment message and Consent Form.

A total of 1047 individuals responded to the recruitment notice in MTurk and began the survey. Of those, 766 were excluded from analysis for various reasons. A total of 594 were excluded because they did not report having a relative with one of the aforementioned cancers. Eighteen more were excluded because they indicated that they had spoken to their doctor or health care provider about genetic cancer screening. One hundred thirty eight respondents did not answer any questions past the public service announcements, meaning they did not answer any of the questions related to the

experiment and were thus excluded. Finally, another 16 were excluded because they did not respond correctly to an item included in the survey to see if they had actually watched the video.

The final sample used for analysis consisted of 281 participants: 137 males (48.8%), 142 females (50.5%), 1 transgender male (0.4%), 1 unreported (0.4%). The age of the participants ranged from 18 to 74 years ($M = 34.09$, $SD = 11.96$). One hundred seventy six respondents (62.6%) identified themselves as White / Caucasian, 66 respondents (23.5%) as Indian /Asian / Pacific Islander, 19 respondents (6.8%) as Hispanic / Latino (a), 8 respondents (2.8%) as Black / African American, 8 respondents (2.8%) as multi-racial, and 4 respondents (1.4%) not reported.

Because the survey was offered through MTurk, respondents came from all over the world. Just over half of the respondents (52.7%), or 148 currently resided in the United States, 41 respondents (14.6%) currently resided in India, 26 (9.3%) respondents lived in Canada, 9 (3.2%) in Venezuela, 6 (2.1%) in the United Kingdom, 5 (1.8%) in Italy, 3 each (1.1%) from Brazil, Finland, Spain, and less than 1% currently living in Australia (1), Bulgaria (2), Chile (1), Costa Rica (2), Croatia (1), Czech Republic (1), Denmark (1), Egypt (1), France (2), Germany (1), Greece (2), Hungary (1), Ireland (2), Israel (1), Japan (1), Lithuania (1), Malta (2), Mauritius (1), New Zealand (1), Philippines (2), Portugal (2), Romania (1), Russia (1), Singapore (2), The Netherlands (1), Turkey (1), and not reported (2).

4.2 Procedure

Primary data collection for this experiment took place entirely online using Mechanical Turk (MTurk). Participants were paid \$0.40 for their participation in this experiment. Once participants indicated their consent, they then were assessed on two variables that could be related to attitude toward genetic cancer screening. Participants were first assessed for level of dispositional optimism using the Life Orientation Test Revised (LOT-R) (Scheier, Carver, & Bridges, 1994) to determine where on the optimism / pessimism scale each participant resides. Participants were also assessed on the extent to which they utilized monitoring or blunting coping styles when presented with a potentially fear-causing situation using the Monitoring Blunting Questionnaire (Muris, van Zuuren, de Jong, de Beurs &

Hanewald, 1994). Neither of these measures will be used in this study but will be used for later exploration of this data.

Participants were then randomly assigned to view one of the two experimental messages (PSAs) or assigned to a control group. After viewing the videos, participants were asked to report their emotional responses to the videos they watched and to report their attitude toward genetic cancer screening.

At that point, participants were screened for family history of cancer and history of genetic cancer screening. The screening questions consisted of three yes / no questions addressing family history of cancer, personal history of cancer, and whether or not they had been genetically screened for cancer susceptibility. Only those with a family history of cancer, no personal history of cancer, and no prior genetic cancer screening proceeded to the survey questions that followed exposure to the PSA or control video. These measures will be discussed in detail in the following section. Those who did not have a family history of cancer, those with a personal history of cancer, or those who had previously received genetic cancer screening were routed to a different set of questions not related to the PSAs. Finally, participants were taken to a page that displayed a debriefing message that acknowledged the potential difficulty of answering questions about cancer screening and provided them with a link for more information about genetic testing. The message appears in Appendix J.

4.3 Experimental stimuli

The experimental stimuli utilized in this study consisted of two video public service announcements (PSAs) created for the purposes of this study and a third video which was shown to the control group. The experimental videos were 2-minute public service announcements produced utilizing the scripts written during pilot testing phase. These videos promoted the importance of discussing genetic cancer screening with a health care provider. Although the “message” part of the videos contained exactly the same content, the two PSAs were framed differently: one used a loss-frame and an emotional appeal designed to elicit fear; the other PSA used a gain-frame and an emotional

appeal designed to elicit hope. The final scripts used for the production of the two PSAs can be found in Appendix K. The control group video was selected from pre-existing videos that had been posted to YouTube and therefore was not produced as a part of this study. The subject of the control group video was unrelated to genetic cancer screening. Each of the two experimental videos essentially contained three parts: a prologue, the main message (the “body” of the PSA), and an epilogue. The two experimental PSAs each had a different prologue and epilogue but contained the exact same main messaging component. The control group video was a 2-minute video on energy conservation produced by the U.S. Environmental Protection Agency.

4.3.1 Fear PSA

The fear-framed PSA stressed the importance talking to one’s doctor about genetic cancer screening by demonstrating this behavior while also highlighting the consequences of not discussing screening with a doctor. The video can be viewed at: <https://vimeo.com/153825310>.

This PSA began with a prologue that consisted of a stark black and white shot of a young man sitting alone in a wheelchair as sad sounding music plays in the background. At that point the narrator begins to explain that the character in the wheelchair, “Steve”, had been diagnosed with terminal cancer and had also learned that he carried a gene that made him more predisposed to getting cancer. The narration strongly implies that Steve only learned of his genetic predisposition after he’d been diagnosed with terminal cancer when, according to the narrator, “it was too late”.

The video then transitions into the “body” of the PSA by cutting to a shot of another character named “Jenny” sitting nervously in a doctor’s office. This is the main message portion of the PSA where the desired behavior—talking to a doctor about genetic screening—is modeled. As the music shifts to a more upbeat style, the narrator mentions that Jenny’s mom and grandmother both had cancer. As Jenny is called back to the doctor’s office, the narrator states that Jenny “is not going to let this happen to her.” When she is called back to the doctor’s office, the audience learns the reason that Jenny is there is that she has decided to undergo genetic cancer screening. Once in the doctor’s office, the

doctor offers reassurance that genetic screening will help them determine whether or not she carries genes that may predispose her to cancer and that knowing this information can help them put into place a plan that will help prevent her from getting cancer and reduce her risk of prematurely dying from cancer. As the doctor and Jenny continue to talk, the narrator then can be heard describing how simple the process of genetic screening is and why it is important.

The final shot or “epilogue” of the video cuts back to a black and white scene of Steve from a different angle. In this shot, Steve is still sitting alone in his wheelchair, but this time the camera zooms out from overhead creating the illusion that Steve is getting smaller and smaller and more alone as the wheelchair begins to fade into the gray concrete of the balcony. This dramatic shot included the same sad sounding music that was used in the opening and included a somewhat ominous narration warning the audience: “don’t let this happen to you.” The narrator goes on to say that if they have a family history of breast, colon, ovarian, or thyroid cancer that they should talk to their doctor about genetic screening “before it is too late.” The PSA ends with a long overhead shot of Steve sitting alone on a barren concrete balcony, presumably of a hospital. He appears small and alone.

4.3.2 *Hope PSA*

Like the fear PSA, the hope-framed PSA also models the behavior of discussing genetic cancer screening with a doctor but rather than showing the consequences of non-adoption, it shows the positive outcomes of adopting the behavior. In characterizing the behavioral adoption in this way, the video specifically sought to elicit hope. The video can be viewed at: <https://vimeo.com/153825720> .

The hope-framed video began with an upbeat prologue that introduces the same character “Steve.” But instead of seeing Steve in wheelchair and learning that he has terminal cancer, the hope-framed video shows Steve running to an upbeat soundtrack. Although the video points out that Steve does have a gene that puts him at risk for cancer, it also says that he is not afraid and has hope. The video then cuts to the same “body” as the fear video.

The epilogue of the hope-framed video shows a jubilant Steve, enjoying his life, presumably comforted by the knowledge that he has learned about his genetic predisposition to cancer and is taking steps to prevent cancer. The video ends with the same appeal to talk to a doctor about genetic screening.

4.3.3 Control video

Finally, the control video was an unrelated informational video about energy conservation which can be viewed at:

https://www.youtube.com/watch?v=BH-6WopGb9g&list=PLBhfkkujnoRC-KTrX2XsfhlxcN2_PQ4Wr&index=62

The control group video was also approximately two minutes in length and made no mention whatsoever of genetic cancer screening. The video discussed how people can participate in the Environmental Protection Agency's "Energy Star Program." The video was selected largely because it did not appear to contain any particularly strong emotional appeals.

4.4 Measures

All of the measures used in this study can be found in Appendix L. In addition, some of the measures included in the survey, specifically the measures for self-efficacy, optimism and coping strategy, will not be used for this research but were included for future exploration of the data.

4.4.1 Manipulation check

Participants in the two experimental groups were asked to report on their perceptions of the PSA they saw, using measures adapted from Maheswaran and Meyers-Levy (1990). These measures were included to determine the effectiveness of the frame manipulation (hope, fear) in the two experimental videos. Two items addressed the extent to which the messages emphasized the health benefits and advantages of talking to a doctor about genetic screening. These items were rated using a 5-point scale (0 = strongly disagree to 4 = strongly agree). A scale was created by averaging the two items ($M = 3.40$, $SD = .70$). This scale was found to be reliable ($\alpha = .70$).

Two additional items addressed the extent to which the messages emphasized the consequences and disadvantages of not talking to a doctor about genetic cancer screening. These items were rated on the same 5-point scale, and the two items were averaged ($M = 2.16$, $SD = 1.18$). The scale was found to be reliable ($\alpha = .70$).

4.4.2 Emotional response

After viewing one of the three videos, the respondents were asked about how they felt using measures adapted from Dillard, Plotnick, Godbold, Freimuth, and Edgar (1996). Participants reported the extent to which they felt each of 21 different emotions. These 21 emotions were used to construct response scales for 7 primary emotions of interest: fear, hope, anger, courage, sadness, happiness, and puzzlement (three items each). For each item, the 5-point response scale was: 0 = none of this feeling to 4 = a lot of this feeling. Fear was measured using three items: worried, afraid, and scared ($M = 1.17$; $SD = 1.09$) and the scale was reliable ($\alpha = .90$). Hope was measured using three items: hopeful, upbeat, and confident ($M = 1.89$; $SD = 1.09$) and the scale was found to be reliable ($\alpha = .80$). Anger was measured using three items: angry, irritated, and annoyed ($M = .63$; $SD = .91$), and the scale was reliable ($\alpha = .86$). Courage was measured using three items: courageous, fearless, and strong ($M = 1.55$; $SD = 1.11$) and the scale was reliable ($\alpha = .81$). Sadness was measured using three items: dejected, sad, and sorrowful ($M = .82$; $SD = .93$) and the scale was found to be reliable ($\alpha = .82$). Happiness was measured using three items: happy, joyful, and pleased ($M = 1.48$; $SD = 1.17$) and the scale was found to be reliable ($\alpha = .88$). Lastly, puzzlement was measured using the following three items: puzzled, confused, and bewildered ($M = .77$, $SD = .91$) and the scale was found reliable ($\alpha = .82$).

4.4.3 Attitude toward genetic testing

Attitude toward genetic testing was measured using items from Henneman, Vermeulen, van El, Claasen, Timmermans & Cornel (2013). Participants completed a ten-item scale including items such as: “Genetic cancer testing does more harm than good,” “Genetic cancer screening is tampering with

nature” and “Genetic cancer screening should be promoted to people at risk.” Each item was measured using a five-point scale ranging from 0 to 4 (strongly disagree to strongly agree), ($M = 3.04$; $SD = .66$). After reverse-coding negatively-worded items, the 10 items were averaged so higher scores indicate more positive attitudes. The scale was found to be reliable ($\alpha = .81$).

4.4.4 Behavioral intent regarding discussing genetic testing with health care provider

Intent to talk to a health care provider about genetic cancer screening was measured using a 4-item scale adapted from Rhodes and Matheson (2005). Items included: “I intend to talk to my doctor about genetic cancer screening for myself” and “I plan on talking to my doctor and learning more about genetic screening.” Each item was scored on a five-point scale ranging from strongly disagree (0) to strongly agree (4), and the four items were averaged ($M = 2.16$, $SD = 1.15$). The scale was found to be reliable ($\alpha = .93$).

4.4.5 Perceived efficacy of genetic cancer screening (response efficacy)

Perceived efficacy of genetic cancer screening was measured with 3 items adapted from Smerecnik, Quaak, van Schayk, van Schooten, and de Vries (2011). Items include: “Talking to my doctor about genetic cancer screening will increase the chances that I can protect myself from cancer” and “Talking to my doctor about genetic cancer screening is the first step toward getting screened.” The items were rated using a 5-point scale ranging from (0) strongly disagree to (4) strongly agree, and the three items were averaged ($M = 2.98$, $SD = .79$). The scale was found to be reliable ($\alpha = .70$).

4.4.6 Access to health care

Access to health care was measured using items from the household component of the 2010 Medical Expenditure Panel Survey (MEPS). The MEPS household component is sent to individual household members and collects data on many topics including access to health care (U.S. Agency for Healthcare Research and Quality, 2010). The MEPS also asks those who do not have a regular source of health care to specify why. One of the items from the MEPS was: “Is there a particular doctor’s office,

clinic, health center, or other place that you go if you are sick or need advice about your health?” (yes/no). If no, respondents were asked: “What is the main reason you do not have a usual source of health care?” This question was followed by a list of choices including “recently moved into area,” “don’t know where to go for care, “no health insurance” and several others.

The final question from the MEPS survey asked about the difficulty of accessing their health care provider, which was measured on a 4-point scale from 1 = very difficult to 4 = not at all difficult using the item “How difficult is it to get to your health care provider?” ($M = 3.02$, $SD = .891$).

4.4.7 Type of health insurance

Type of health insurance was measured using an item from the American Community Survey (U.S. Department of Commerce, 2015) which asked what type of insurance coverage they had using the following item: “Are you currently covered by any of the following types of health coverage plans?” followed by a list of insurance plans including employer-based insurance, direct purchase, Medicare, Medicaid, Tricare / Military, VA, Indian Health Service, or other.

4.4.8 Video viewing verification

Finally, an item was added to determine whether or not the respondents actually watched the video they were assigned. This item contained a question that asked them to recall something about the video that would be easily recalled if they had in fact watched the video. The hope frame video contained the following item: “The video you just watched contained which of the following (choose one): A man riding a bicycle, a woman driving a car, a man running / jogging, children playing baseball.” The correct answer was “a man running / jogging.” The fear survey contained the following item: “The video you just watched contained which of the following (choose one): A man hiking in the woods, a woman driving a car, a man sitting in a wheelchair, children playing basketball.” The correct answer was “A man sitting in a wheelchair.”

5 RESULTS

5.1 Overview of Analysis

The hypotheses and research questions for this study were addressed using regression-based path analysis to examine the effect of multiple mediators such as discrete emotions and attitude toward genetic screening within a proposed health communication model. The health communication model for this study used fear- and hope-framed health appeals in the form of experimental public service announcements (PSAs) to promote discussing genetic cancer screening with a health care provider for those genetically predisposed for higher cancer risk. The hypotheses made predictions about the influence of these framed health appeals on attitudes toward genetic cancer screening and intent to discuss screening with a health care provider, as well as the extent to which discrete emotions and other factors mediate the relationship between message frame and these outcomes. The results of all of the hypotheses proposed in Chapter 2 as well as the results of the manipulation check will be reported in this chapter.

The first set of analyses compared the two experimental groups (fear-framed and hope-framed PSAs) to the control group on the four measured variables, using one way analyses of variance (ANOVAs). These ANOVAs addressed the first three hypotheses, H₁ and H₂, which tested levels of emotion elicited by the framed PSAs in comparison to the control PSA, and H_{3a} and H_{3b} which tested whether the framed messages seen by the experimental groups resulted in a more positive attitude toward genetic cancer screening (H_{3a}) and greater intent to discuss genetic screening with a health care provider (H_{3b}) than the control group.

The next set of analyses examined a model that proposed relationships among the experimental frame (fear, hope), attitude toward genetic screening, and behavioral intent to discuss. H_{4a} examined the effect of frame on attitude toward genetic cancer screening and H_{4b} examined the effect of frame on intent to discuss genetic cancer screening with a health care provider. H₅ examined the association between attitude toward genetic cancer screening and intent to discuss genetic cancer screening with a

health care provider. H₆ examined the extent to which attitude toward genetic cancer screening mediated the relationship between message frame and intent to discuss genetic cancer screening with a health care provider. H_{4a}, H_{4b}, and H₅ were addressed with Pearson's correlations, and then the full model (including the mediation hypothesis, H₆) was tested using regression-based path analysis.

The next section examined the extent to which the discrete emotions of fear and hope mediated the influence of message frame on attitude toward genetic screening. The model proposed a partial mediation of framing effect on attitude by fear and hope. H₇ examined the association between fear and attitude toward genetic cancer screening. H₈ examined the extent to which fear partially mediated the relationship between message frame and attitude toward genetic cancer screening. H₉ examined the association between hope and attitude toward genetic cancer screening. Finally, H₁₀ examined the extent to which hope partially mediated the relationship between frame and attitude. The bivariate relationships were initially addressed with Pearson's correlations.

The final section consists of a supplemental analysis that utilized regression-based path analysis to assess the indirect effect of message frame on intent to discuss genetic cancer screening with a health care provider through the discrete emotions of fear and hope.

Prior to these analyses, however, is a summary of the background information from the respondents, including respondents' health related characteristics and access to health care provider and insurance.

5.2 Health-related characteristics

5.2.1 Relatives reported with cancer

Respondents were asked to identify which of their relatives had been diagnosed with one of the cancers of interest (breast, colon, thyroid, ovarian, cervical, tubal, or peritoneal). A total of 203 of respondents (72.2%) reported only one relative had been diagnosed with one of these cancers, and 78

respondents (27.8%) reported having more than one relative who had one of these types of cancers. The most common relative cited was grandmother (111 respondents; 39.5%), followed by aunt (85 respondents; 30.2%), mother (55 respondents; 19.6%), grandfather (50 respondents; 17.8%), uncle (27 respondents; 9.6%), father (22 respondents; 7.8%), cousin (14 respondents; 5.0%), sister (9 respondents; 3.2%), and brother (4 respondents; 1.4%). A Pearson chi-square test was run for each type of relative to determine if there were any significant differences between the three groups (fear frame, hope frame, control) and the only significant difference was found for grandmother, $X^2(2, N = 281) = 6.65, (p < .05)$. Thirty respondents (30.6%) from the hope group, 45 respondents (48.9%) from the fear group, and 36 respondents (39.6%) from the control group reported that their grandmother had at least one type of the cancers listed above.

5.2.2 Types of cancer reported among relatives

In addition to being asked which relatives had one of the cancers of interest, respondents were also asked to identify which types of cancer the relatives had. Overall, 210 (74.7%) respondents identified only one type of cancer while 71 respondents (25.3%) identified multiple types of cancer. The most identified cancer was breast cancer with 149 (53.0%) respondents reporting at least one relative having breast cancer. The next most commonly reported type of cancer was colon cancer with 102 respondents (36.3%) reporting at least one relative having it, followed by thyroid cancer (38 respondents; 13.5%), ovarian cancer (37 respondents; 13.2%), cervical cancer (24 respondents; 8.5%), tubal cancer (8 respondents; 2.8%), and lastly, peritoneal cancer (7 respondents; 2.5%). Pearson chi-square tests were run for each type of cancer and no significant differences were found among the three groups for any of the types of cancer reported among relatives.

5.3 Access to and type of health care and health insurance

5.3.1 Regular source of health care

Respondents reported on whether they had a regular source for health care. According to their responses, 200 participants (71.2%) reported that they did have a particular doctor's office or clinic that they go to when they are sick or need advice about their health, whereas 80 (28.5%) responded no to this question with one respondent (0.4%) not reporting. A Pearson chi-square test was run to determine if there were any significant differences between the three groups on access to health care (yes, no), and although there were none, it did approach significance, $X^2(2, N = 280) = 5.82, p = .055$. Seventy-six respondents (77.6%) from the hope group, 68 respondents (73.9%) from the fear group, and 56 respondents (62.2%) from the control group reported yes to this question.

Respondents also reported on why they may not have a regular source of health care. A total of 80 participants indicated that they did not have a usual source of health care. For those who reported that they did not have a regular source of health care health care, 39 respondents (49.0%) cited multiple reasons. The most common reason cited was that they seldom or never get sick (41 respondents; 51.3%) followed by cost of health care (28 respondents; 35.0%), not knowing where to go for health care (19 respondents; 23.8%), recently moving to the area (17 respondents; 21.3%), do not have health insurance (17 respondents; 21.3%), don't use doctors or treat themselves (14 respondents; 17.5%), like to go to different places for health care (13 respondents; 16.3%), recently changed insurance (4 respondents; 5.0%), could not find a provider who spoke their language (2 respondents; 2.5%), usual source of health care is no longer available (2 respondents; 2.5%), and finally other reasons not specified (11 respondents; 13.8%). A Pearson chi-square test was run for each of these reasons to determine if there were any significant differences between the three groups on reason for no regular source of health care and there were none found.

5.3.2 *Access to health care provider*

Respondents reported on their difficulty of accessing health care providers. According to the data, 21 respondents (7.6%) found it very difficult to access their provider, 44 (15.8%) found it somewhat difficult, 121 (43.5%) found it not too difficult, and 92 (33.1%) found it not at all difficult. A one-way ANOVA was run to determine if there were any differences among the three groups for access to health care provider and there were no statistically significant differences found $F(2,277) = 0.661, p = .517$.

5.3.3 *Type of health insurance*

Respondents were asked to report on the type of health insurance coverage they had. The most common type of insurance reported was insurance through their current or former employer or union (129 respondents; 47.6%), followed by purchasing insurance directly from an insurance company (69 respondents; 25.7%), Medicaid recipients (57 respondents; 21.5%), Medicare recipients (19 respondents; 7.1%), Indian Health Service (IHS) (15 respondents; 5.7%), TRICARE / Military (10 respondents; 3.8%), and the Veteran's Administration (VA), (9 respondents; 3.4%). A total of 78 respondents (27.8%) reported obtaining insurance from multiple sources, 55 respondents (20.5%) reported "other," and 45 respondents (16%) did not report. A Pearson chi-square test was run for each type of insurance reported to determine if there were any significant differences between the three groups. There was a significant difference among groups only for insurance through current or former employer or union, $X^2(2, N = 271) = 10.36, p < .01$. Fifty-five respondents (57.9%) from the hope group, 45 respondents (49.5%) from the fear group, and 29 respondents (34.1%) from the control group reported that they obtained insurance from a current or former employer or union.

5.4 **Manipulation check**

To determine if the fear-framed and hope-framed messages differed as intended in the extent to which they were perceived as conveying advantages and disadvantages of discussing genetic cancer

screening, two independent sample t-tests were conducted. The analyses compared the two experimental groups on two measures that assessed the extent to which the messages emphasized: 1) the disadvantages and loss of health benefits that would occur if they did not talk to a doctor about genetic screening (perceived disadvantages); and 2) the advantages and gaining of health benefits by talking to a doctor about genetic screening (perceived advantages). The t-tests showed that the respondents who saw the fear framed message ($M = 2.60$) perceived greater disadvantages of not discussing genetic screening with a health care provider than those who saw the hope framed message ($M = 1.75$), $t(188) = -5.33$, $p < .001$. There was no significant difference in the extent to which the two groups perceived the advantages, $t(188) = -.790$, $p = .430$. These findings suggest that the framed messages successfully manipulated perceptions of disadvantages but did not similarly manipulate perceptions of the advantages of discussing genetic cancer screening with a health care provider.

5.5 Comparison of the two experimental groups to the control group

Measured variables used in this study included emotions felt after watching the messages, attitude toward genetic cancer screening, and intent to discuss genetic cancer screening with health care provider (behavioral intent). A series of one-way analyses of variance (ANOVAs) examined the differences between the experimental groups (i.e., the groups that saw one of the two experimental PSAs) and the control group on these measured variables. To test H_1 the levels of fear elicited by the fear frame PSA was compared to the levels of fear elicited by the other two PSAs (hope and control). To test H_2 , the levels of hope elicited by the hope PSA were compared to the levels of hope elicited by the other two PSAs. To test H_{3a} and H_{3b} , the groups were compared on attitude toward genetic cancer screening and intent to discuss screening with a health care provider. The means and standard deviations for the main measured variables for all groups (both experimental and control), as well as the ANOVA results, can be found in Table 5.

Table 5. Means, Standard Deviations, and ANOVA Results for all groups (experimental and control)

Variables	Fear frame		Hope frame		Control		ANOVA		
	Mean	SD	Mean	SD	Mean	SD	dfs	F	p-value
Fear	1.60 _b	1.07	1.30 _b	1.06	.61 _a	.90	2, 278	23.5	.001
Hope	1.50 _a	1.00	2.00 _b	1.06	2.20 _b	1.12	2, 278	10.5	.001
Attitude toward genetic cancer screening	3.08	.70	3.08	.70	2.94	.64	2, 278	1.21	.300
Behavioral intent to discuss genetic screening with health care provider	2.30 _b	1.15	2.37 _b	1.10	1.83 _a	1.14	2, 278	5.81	.003
n	92		98		91		281		

Note. All scales could range from 0 to 4. Means in the same row with no subscripts in common differ at $p < .05$ using the Tukey method.

H₁ predicted that the fear-framed PSA would result in higher levels of fear than the (a) the control message or (b) the hope-framed PSA. This hypothesis was partially supported, $F(2,278) = 23.5, p < .001$. Tukey post hoc tests revealed that fear was significantly higher among the fear group ($M = 1.60$) than the control group ($M = .61$), $p < .001$. There was no significant difference between the fear and hope groups ($M = 1.30$), although it did approach significance ($p = .089$).

H₂ predicted that the hope-framed PSA would result in higher levels of hope than (a) the control message or (b) fear PSA. This hypothesis was partially supported, $F(2, 278) = 10.50, p < .001$. Tukey post hoc tests revealed that hope was significantly higher among the hope group ($M = 2.00$) than the fear group ($M = 1.50$), $p < .01$ but there was no significant difference between the hope group and the control group ($M = 2.20$), $p = .372$.

H_{3a} predicted that the fear framed and hope framed messages would result in more positive attitudes toward genetic screening than would the control message. This hypothesis was not supported, $F(2,278) = 1.21, p = .300$. The means for attitude toward genetic screening for each of the three groups were as follows: Hope group, $M = 3.08$, fear group, $M = 3.08$, and control group $M = 2.94$.

H_{3b} predicted that the fear-framed and hope-framed messages would result in greater intent to discuss genetic screening with a health care provider than would the control message. This hypothesis was supported. There was a statistically significant difference among the groups, $F(2, 278) = 5.813, p < .01$. Tukey post hoc tests revealed that, compared to the control group ($M = 1.83$), behavioral intent to discuss genetic screening was significantly higher in the hope group ($M = 2.37, p < .01$) and the fear group ($M = 2.30, p < .05$). There was no statistically significant

difference between the hope and the fear groups ($p = .761$). So clearly, the appeals by themselves appeared to have some effect on intent to discuss screening. Those that watched one of the PSAs were significantly more likely to intend to discuss genetic cancer screening with their doctors than those who did not watch a PSA.

5.6 Preliminary analysis of relationships among all key variables

The rest of the analyses focus solely on the experimental groups (i.e. the fear-framed PSA and the hope-framed PSA). Zero-order correlations were computed among all key variables for participants in the two experimental groups. Variables included age, gender, message frame (0 = fear frame, 1 = hope frame), fear, hope, attitude toward genetic cancer screening, and intention to discuss genetic cancer screening with a health care provider. The correlations, along with means and standard deviations, are presented in Table 6.

Table 6. Means, Standard Deviations, and Zero-Order Correlations between Variables for Experimental Groups

	Mean	SD	1	2	3	4	5	6
1. Age	33.56	12	---					
2 Gender	---	---	.038	---				
3. Frame	.52	.50	.105	-.114	---			
4. Fear	1.44	1.07	-.223**	-.080	-.144*	---		
5. Hope	1.74	1.06	.112	-.264**	.232***	-.029	---	
6. Attitude Toward Genetic Screening	3.08	.67	.132	.078	-.002	-.103	.007	---
7. Behavioral Intent to Discuss	2.31	1.12	-.002	-.140	.052	.285***	.229***	.396***

Note. All scales could range from 0 to 4. Gender was coded 1 = male, 2 = female. Frame was coded 0 = fear frame, 1 = hope frame.

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

Table 6 shows that, when only the two experimental groups were included, the fear frame led to more fear than did the hope frame, and the hope frame led to more hope than did the fear frame. But the frame manipulation was not related to any of the measures that dealt with genetic cancer screening. The emotions of fear and hope were both associated with greater intention to discuss genetic cancer screening with a health care provider, but were unrelated to attitude. The measures that dealt with genetic cancer screening – attitude and intention to discuss – were positively correlated.

5.7 Testing the influence of frame on attitude toward genetic cancer screening and intent to discuss genetic cancer screening.

This section examines the relationships included in the basic path model presented earlier in Figure 1. This model predicted that, compared to the hope frame, the fear frame would lead to more positive attitudes toward genetic cancer screening (H_{4a}) and greater intent to discuss genetic cancer screening with a health care provider (H_{4b}), that respondents' attitude toward genetic screening is positively associated with intent to discuss genetic screening (H_5), and that attitude would mediate the influence of frame on intent to discuss (H_6).

H_{4a} predicted that the fear framed message would result in a more positive attitude toward genetic cancer screening than the hope framed message. As noted above, Table 6 shows that frame was not related to attitude toward genetic cancer screening. Therefore, H_{4a} was not supported.

H_{4b} predicted that the fear-framed message would result in greater intention to discuss genetic screening with a health care provider than the hope-framed message. As reported above, Table 6 shows that frame was not related to intention to discuss genetic cancer screening. Therefore, H_{4b} was not supported. In neither of the two primary outcome variables, (attitude,

behavioral intent) was there any significant difference between the experimental conditions suggesting that neither framed PSA had a persuasive advantage.

H₅ predicted that respondents' attitude toward genetic cancer screening would be positively associated with intent to discuss genetic screening with a health care provider. Table 6 shows that attitude toward genetic cancer screening was positively associated with behavioral intent to discuss genetic cancer screening with a health care provider ($r = .396$). Therefore, H₅ was supported.

H₆ predicted that attitude toward genetic cancer screening would mediate the effect of framed message on intent to discuss genetic screening with a health care provider. The fact that the frame manipulation had no effect on either attitude or behavioral intent means that attitude could not function as a mediator. However, for completeness, a mediation analysis was conducted utilizing procedures specified by Darlington and Hayes (2017) using the PROCESS macro. Age and gender were controlled in this analysis. The PROCESS macro for SPSS developed by Dr. Andrew F. Hayes and is an add-on for SPSS and SAS that allows for mediation analysis. The PROCESS macro uses an ordinary least squares or logistic regression-based path analytic framework for estimating direct and indirect effects in single and multiple mediator models (Hayes, 2016). The resulting model is presented in Figure 3.

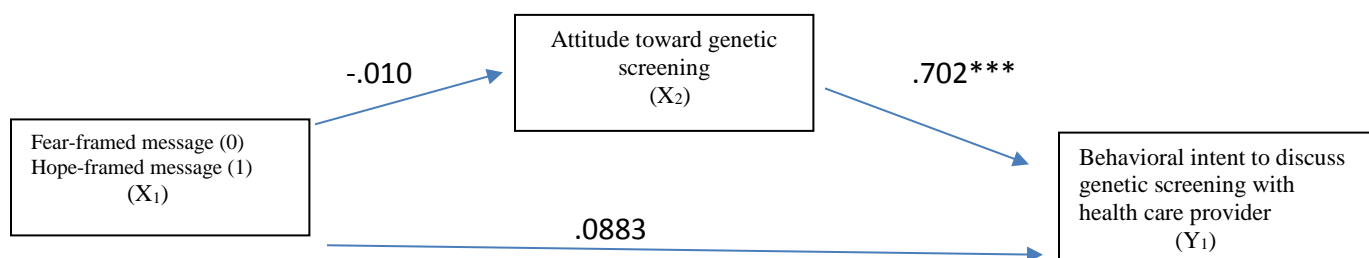


Figure 3. Model of mediation of framing effect on behavioral intent by attitude, controlling for age and gender.

While controlling for age and gender, it was determined the direct effect of message frame on behavioral intent was .088 which was not significant ($p = .558$). The direct effect of frame on attitude toward genetic cancer screening was -.010 which also was not significant ($p = .915$). The direct effect of attitude on intent was .702 which was significant ($p < .001$). The indirect effect of frame on intent (with attitude as the mediating variable), was -.007. In order to ascertain the significance of this effect, however, confidence intervals for this effect were analyzed. Darlington and Hayes (2017) strongly suggest the use of confidence intervals in establishing the significance of effect sizes. Because the confidence interval associated with this effect contained zero, CI [-.148, .131] this would suggest that attitude toward genetic cancer screening did not mediate the relationship between message frame and behavioral intent, therefore H_6 is not supported.

5.8 Mediation of the effect of frame on attitude by discrete emotions

One of the main questions of this study is to determine the extent to which emotions, specifically fear and hope, mediate the relationship between the framed messages and attitude toward genetic screening. The proposed model was presented earlier in Figure 2. The proposed relationships within that model are first addressed separately, and then the full model is tested using the PROCESS macro (Hayes, 2016), controlling for age and gender.

This model included two bivariate relationships with fear: the effect of frame on fear (H_{1b}), which was addressed previously, and the relationship between fear and attitude (H_7). Recall that H_{1b} predicted that the fear message would elicit greater level of fear than the hope message. When the three groups (fear-framed, hope-framed, control) were compared in one ANOVA, a Tukey post hoc test showed that the fear-framed message produced a marginally

greater level of fear than did the hope-framed message. However, Table 6 shows that when only the two PSAs were compared, the difference reached significance ($r = -.144, p < .05$).

H₇ predicted that fear would be positively associated with attitude toward genetic scanner screening. The zero-order correlation in Table 6 shows that there is no significant correlation between fear and attitude toward genetic cancer screening ($r = -.103$). Therefore, H₇ was not supported.

H₈ predicted that fear would mediate the expected relationship between message frame and attitude toward genetic cancer screening (predicted in H_{4a}). As previously discussed, a variable can be said to function as a mediator to the extent that it accounts for the relation between the predictor (independent variable) and the criterion variable (dependent variable) (Baron & Kenny, 1986). In this model, the independent variable is the framed message (fear frame or loss framed PSA) and the dependent variable is attitude toward genetic cancer screening. In order for mediation to occur, however, certain conditions must exist. The first step in establishing mediation is to show that the independent variable is correlated with the dependent variable which establishes that there is an effect that may be mediated (Kenny, 2014). As already reported, and as indicated in Table 6, message frame had no influence on attitude toward genetic cancer screening ($r = -.002$). Darlington and Hayes (2017) argued that under certain conditions mediation can occur for a nonsignificant effect. However, in this case, the mediator must be associated with both the independent and dependent variables. That was not the case here. Although the frame affected fear, fear was not related to attitude (correlation near zero). Thus, there can be no mediation. Hence H₈ was not supported.

The model also proposed that hope would mediate the relationship between framed message and attitude toward genetic cancer screening. This model included two bivariate

relationships with hope: the effect of frame on hope (H_{2b}), which was addressed previously, and the relationship between hope and attitude (H_9). Recall that in H_{2b} it was predicted that the hope-framed message would elicit higher levels of hope than the fear message and it was found that this was the case. As shown in Table 6, level of hope was significantly higher among the hope group than the fear group, $r = .232, p < .001$.

H_9 predicted that hope would be positively associated with attitude toward genetic screening. As indicated in Table 6, there was no significant correlation between hope and attitude toward genetic cancer screening ($r = .007$). Thus, H_9 was not supported

Finally, H_{10} predicted that hope would partially mediate the relationship between frame and attitude but would be a weaker mediator than fear. For H_{10} to be supported, the same conditions for mediation would again have to be present. This was not the case. As reported above, although message frame affected hope, the emotion of hope was not correlated with attitude toward genetic cancer screening; in fact, the correlation was near zero. Therefore, there can be no mediation. Hence, H_{10} was also not supported.

For completeness, the proposed mediation model was tested using the PROCESS macro, controlling for both age and gender. This model is presented in Figure 4. In this analysis, no significant indirect effect of the emotion frame via either fear (.013), $CI[-.009, .07]$ or hope (.004), $CI[-.039, .06]$ was discovered.

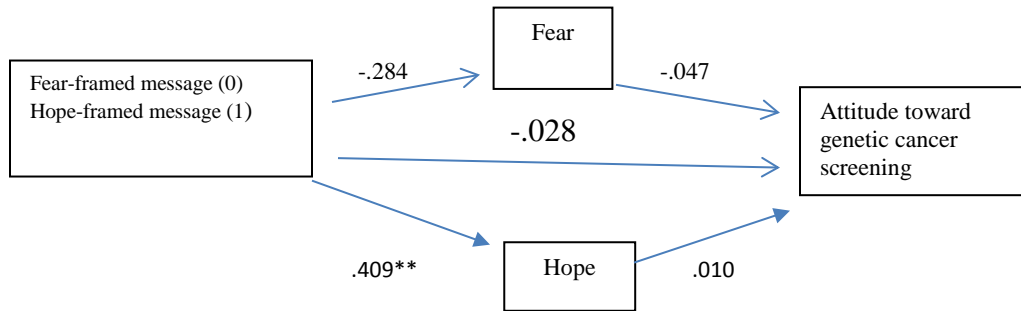


Figure 4. Model of mediation of framing effect on attitude by fear and hope, controlling for age and gender.

5.9 Supplemental analysis: Mediation of the effect of frame on intent to discuss genetic cancer screening by discrete emotions

The previous section made it clear that emotions did not mediate the relationship between message frame and attitude toward genetic cancer screening as had been predicted. But since a large portion of this paper focuses on the effect of discrete emotions in a persuasive model, it is worth exploring the possibility that these emotions mediate the other outcome examined in this study. Therefore, a supplemental analysis was conducted to examine whether fear or hope mediated the effect of frame on behavioral intent to discuss genetic cancer screening. An analysis was run utilizing the PROCESS macro (Hayes, 2016), controlling for age and gender, to determine whether there was an indirect effect of message frame on intent to discuss genetic cancer screening through the emotions of fear and hope. The model in Figure 5 depicts the mediation of framing effect on behavioral intent by fear and hope.

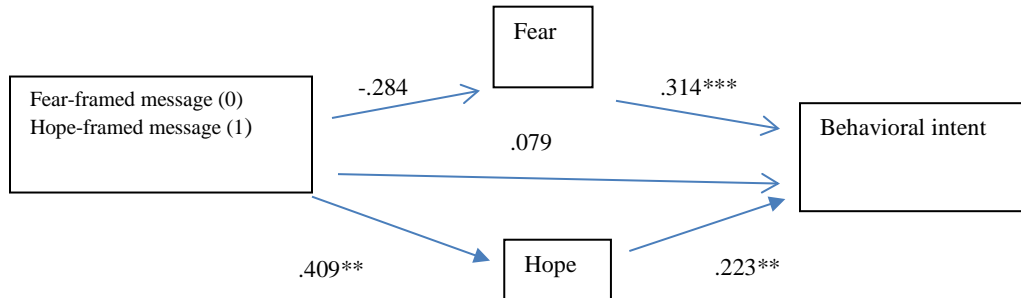


Figure 5. Model of mediation of framing effect on behavioral intent by fear and hope, controlling for age and gender.

In the analysis, after controlling for age and gender, it was determined that the direct effect of frame on behavioral intent, .079, was not significant ($p = .621$), but the emotion frame did have indirect effects on behavioral intent via both fear and hope. The direct effect of frame on fear was $-.284$, which approached significance ($p = .065$), and the direct effect of fear on intent was $.314$, which was significant ($p < .001$). The direct effect of frame on hope was $.409$, which was significant ($p < .001$), and the direct effect of hope on intent was $.223$, which was also significant ($p < .001$). Overall, it was determined that there was a significant indirect effect of message frame on intent through both fear ($-.089$), $CI[-.210, -.002]$ and hope ($.091$), $CI[.022, .213]$.

6 DISCUSSION

As previous research has found, message frames don't act in a vacuum. Put another way, a framed-message by itself isn't usually sufficient to motivate behavior. For example, O'Keefe and Jensen (2007, 2009) appeared to find little evidence of the singular effect of frame on health behaviors. This would suggest that for message frames to have any significant effect, other factors must be involved. To that point, the work of Yan et al. (2010), supports this notion, suggesting that message framing effects do exist but appear to be contingent on other factors.

Factors that have already been examined within the context of framing research include demographics (age and race), perceptions and beliefs related to the health behavior, and perceived susceptibility to the adverse health outcome among others. Similar to those studies, the focus of this research was to examine other factors that could potentially interact with message frame to influence outcomes related to genetic cancer screening. This study, however, sought to explore factors related to how people respond emotionally to framed health appeals. The factors examined by this study were attitude toward genetic cancer screening and discrete emotions, specifically hope and fear. The outcomes of interest in this study were attitude toward genetic cancer screening and intent to discuss genetic cancer screening with a health care provider.

As the title suggests, the primary focus of this study was to examine the extent to which hope and fear mediated the relationship between message frame and attitude toward genetic screening. Of the many possible discrete emotions to examine for this study, hope and fear were selected in part because of their relevance to health decisions and their distinctly different emotional tone. As described above, fear is widely regarded as a strongly negative emotion and with the inherent negativity bias present in psychological research it should come as no surprise that there is an extensive literature on the effectiveness fear appeals. Hope on the other hand is considered a positive emotion and its effect has been studied to a much lesser degree within the context of emotional health appeals.

As the literature has shown, fear can certainly motivate people to adopt health behaviors under certain circumstances but the question remained, can the elicitation of a positive emotion such as hope influence attitude and behavioral adoption? Recent work by Nabi and Prestin (2016) suggests that it can. Although they found that hope did not independently influence risk

perceptions it did interact with another factor, specifically response efficacy to increase behavioral intention (Nabi & Prestin, 2016) related to health prevention behaviors (HPV prevention).

Emotion, however, was only one of the factors this study explored. The importance of attitude toward a behavior should was also considered as a possible mediator of message frame effectiveness because of its potential to influence behavior. Therefore, this study also examined how attitude toward genetic screening functioned as a mediator between message frame and behavioral intent.

As previously discussed, five different models of mediation were developed for this study: a model for testing the mediation of framing effect on intent by attitude, models for testing the mediation of framing effect on attitude by both hope and fear, and models for testing the mediation of framing effect on behavioral intent by hope and fear. Analyses revealed that the framed PSAs used in this study (fear-framed, hope-framed) had no effect on either attitude toward genetic cancer screening or intent to discuss genetic cancer screening with a health care provider. Additionally, this study found no evidence that attitude toward genetic screening mediated the effect of frame on behavioral intent nor did it find that fear or hope mediated the effect of frame on attitude toward genetic cancer screening. However, despite the lack of a direct effect of frame on behavioral intent, the study did find evidence of mediation in the latter two of the five models, which addressed the emotions of fear and hope as mediators. Specifically, the study found evidence that the message frame had an indirect effect on intent to discuss genetic cancer screening with a health care provider, which was the health behavior targeted by the messages, via the emotions of both fear and hope. This is a notable finding because it suggests that both hope and fear played a role in the influence of the PSAs on behavioral intent rather than

on attitude as initially thought. More importantly, it suggests that the emotions of both hope and fear contributed to the persuasive influence of the PSAs on behavioral intent to discuss genetic cancer screening.

This study suggests that both hope and fear can play a role in the influence of health PSAs. At the broadest level, this is consistent with the notion that emotions can influence behavior. Especially the emotions examined in this study. Izard (1977) for example discussed the potency of fear, positing that it can have a very profound effect on an individual's perception, thought, and action. Furthermore, there is large portion of literature suggesting that fear appeals are especially effective when used in the promotion of a health detection behaviors (Tannebaum, 2013)

Likewise, hope has also been found to play a potentially important role in influencing behavior. Bar-Tal (2001) argued that hope was a fundamental psychological reaction for every person that also plays an important role in determining human behavior. More recently, work by Prestin (2013) suggested that hopeful emotional responses to messages can lead to greater motivation and that such "approach oriented motivational responses are consistent with the action tendency of hope" (p. 336).

Consistent with this, findings from this study suggest that the use of hope appeals may also be just as effective as fear appeals in promoting such health detection behaviors, such as discussing genetic cancer screening. Indeed, the very premise of this study of course was to seek out potentially effective alternatives to fear appeals, to seek out ways to motivate people other than terrifying them in to adopting a behavior and evidence from this study seems to indicate that the use of hope appeals may be a viable alternative to the use of fear appeals.

6.1 Overall effectiveness of the PSAs compared to a control condition

The first analyses examined the overall effectiveness of the two PSAs (fear-frame message, hope-framed message) compared to a control group. The two framed messages that were used in this study were designed specifically to elicit certain emotional responses. The fear-framed message should have led to more fear relative to the other messages whereas the hope-framed message should have led to more hope. Likewise, it was also expected that both the fear- and hope-framed messages would result in a more positive attitude toward genetic cancer screening and greater intent to discuss genetic cancer screening than the control message, which made no mention of genetic screening.

H₁ predicted that the fear-framed PSA would result in higher levels of fear than both the control group and the hope group. Fear was significantly higher in the fear group than the control group, but was only marginally higher than the hope group, when all three groups were compared. This would seem to suggest that there was some element in both PSAs that elicited fear. In other words, it would appear that respondents in both the hope and the fear groups had a fear response to the message, regardless of the frame used. This is understandable when one considers the potentially dire outcomes associated with the diagnosis of cancer. This was still a somewhat unexpected finding, however. The fear-framed PSA produced for this study was intended to be a “classic” fear appeal designed to elicit high levels of fear. Recall that fear appeals are persuasive messages designed to scare people by describing the terrible things that will happen to them if they do not do what the message recommends (Witte, 1992a). The fear-framed PSA in this study was quite explicit (and rather dramatically so!) in its demonstration of the potential consequence of not discussing genetic cancer screening with a health care provider while the hope PSA focused on showing the positive “consequences” of adopting the behavior.

The fact that the hope message still led to fearful responses could be attributable to the high level of fear associated with cancer in general.

Similarly, H₂ predicted that the hope-framed PSA would result in higher levels of hope than both the fear and the control groups. Levels of hope were significantly higher in the hope group than the fear group which was expected. However, there was no significant difference in the levels of hope between the hope group and the control group. This outcome may be due to an increase in hope by the control message, a suppression of hope by the fear-framed PSA, or both. Although the control group message was selected because it was thought to not contain any strong emotional appeals, it did discuss how easy it is for people to take simple steps to save energy and help protect the planet. It specifically told people that they could “make a difference” and help the planet. These could have been perceived as somewhat hopeful messages. In retrospect, this should have been checked in the pilot tests. Alternatively, the fear message may actually have suppressed hope within that group.

The next set of hypotheses examined the effect of the two framed PSAs, compared to the control group, on both attitude toward genetic screening and intent to discuss genetic screening with a health care provider. The findings from these analyses were mixed. For example, H_{3a} predicted that the fear framed message and the hope framed messages would result in more positive attitudes toward genetic screening than the control group message. This was found not to be the case. There was no significant difference in attitude toward genetic cancer screening between the experimental and control groups. This was a somewhat surprising finding because although the experimental messages were framed differently, they both highlighted the benefits of genetic cancer screening whereas the control group saw a video completely unrelated to genetic cancer screening. This shows that the experimental PSAs were largely ineffective at

changing attitudes toward genetic screening relative to the control group. This finding could suggest that attitude toward genetic cancer screening may have already been somewhat solidified among all of the respondents before even seeing the videos. This is somewhat consistent with other findings that suggest attitudes toward genetic screening are generally positive (Henneman et al., 2013; Morren, Rijken, Bannanders, & Bensing, 2007).

H_{3b} predicted that the experimental groups (hope and fear) would be more likely than the control group to discuss genetic cancer screening with their doctor. In other words, it was predicted that behavioral intent would be higher amongst the experimental groups than the control group. This was found to be the case. Well over half of the experimental videos' two-minute run time was spent showing someone engaging in the behavior of visiting a doctor to discuss genetic cancer screening. Those who did not view the experimental videos did not see this behavioral modeling nor did they receive the specific guidance about the importance of discussing genetic cancer screening. This would suggest that seeing the behavior actually modeled in the experimental conditions increased the likelihood of adopting that behavior. Therefore, watching the videos did account for the differences in behavioral intent as expected.

Overall, these findings suggest that the experimental PSAs did have some effect on emotions and behavioral intent but none on attitude toward genetic screening, compared to the control condition. Perhaps the reason that behavioral intent was greater and not attitude was the fact that the PSAs modeled the behavior of discussing genetic screening with a doctor but did not model actual genetic screening.

Another reason may have been self-efficacy related to behavior. Although not specifically examined in the context of the models, self-efficacy, is the belief that one can perform an action intended to reduce the impact of a condition (Strecher & Rosenstock, 1997). In

this case, talking to a health care provider about genetic screening may have been perceived as a behavior that they could perform. It is worthwhile to note that self-efficacy has previously been examined within the context of framing research which to some extent was the reason it was not the focus of this study. For example, in studying frames and self-efficacy, Van 'T Riet and colleagues (2008) found that people with high self-efficacy beliefs about quitting smoking had higher levels of motivation to quit smoking after viewing a loss-framed message.

It is probably important to point out that although the PSA's were designed to positively portray genetic cancer screening, the PSAs didn't actually focus on genetic screening as much as they did on discussing genetic cancer screening with a doctor. This difference may be crucial to understanding why the emotional appeals failed to have any effect on attitude toward genetic cancer screening. The PSA's may have had an effect on attitudes toward discussing genetic cancer screening with a doctor (which was the modeled behavior) but the survey did not specifically ask about that. Had attitudes toward discussing genetic screening with a doctor been measured in the survey, it may have been determined that emotions did mediate the relationship between message frame and attitude toward discussing genetic screening. As it stands, another measure would have had to be created to make that determination

6.2 Comparison of the framed PSAs

The previous section compared the responses of the experimental PSAs to those of the control group message. The discussion will now move on to compare the two experimental PSAs to each other. This section will focus on the results of testing of the first model that was proposed in chapter 2. This model examined the influence of the framed messages on attitude and behavioral intent to discuss genetic cancer screening, and whether attitude mediated the

framing effect on behavioral intent. Prior to discussing this model, however, this section will discuss the relationships among all key variables for the experimental groups.

The manipulation check showed that the fear-framed message did result a greater perception of the disadvantages of not adopting the behavior than did the hope-framed message, and the frame manipulation did result in the expected elicitation of discrete emotions: the fear frame was significantly associated with the level of fear elicited and (when the two frames were directly compared) the hope frame was significantly associated with the elicitation of hope. However, frame was not related to either of the measures related to genetic cancer screening (attitude or behavioral intent). Furthermore, the emotions of fear and hope were not related to attitude, but both emotions were associated with greater behavioral intent. Additionally, it was determined that attitude toward genetic screening was also related to behavioral intent.

The first model explored the influence of message frame on attitude toward genetic cancer screening and intent to discuss genetic screening with a health care provider, as well as whether attitude mediated the influence of frame on behavioral intent. In H₄, the study looked at whether individual frames differentially influenced attitude toward genetic screening and intent to discuss genetic cancer screening with a health care provider. Specifically, H₄ predicted that the fear-framed message would (a) result in a more positive attitude toward genetic cancer screening than the hope message and (b) that it would lead to greater intent to discuss genetic cancer screening with a health care provider. These predictions were based largely on previous research suggesting that fear appeals tend to be more effective when those appeals contain information that people can use to reduce the threat (Bastien, 2011; Tannebaum 2013). In this case, the fear appeal contained both a strong element of fear inducing imagery and narration but also provided a very clear action viewers could take to reduce the threat. Yet, there was no

evidence in support of either prediction. Specifically, there was no statistically significant difference in attitude or behavioral intent between the two experimental groups—the fear appeal did not lead to a more positive attitude toward genetic screening nor did it lead to greater behavioral intent. Therefore, despite research indicating that this was the more likely outcome, this did not occur in this study. There was no significant difference in the outcomes between the two experimental groups despite the fact that the different PSAs elicited the intended emotions.

Thus far it has been established that message frame had no influence on either attitude toward genetic screening or behavioral intent. But the model also examined whether attitude influenced behavioral intent. Shen and Dillard (2007) point out that attitudes can influence behavior. Therefore, H₅ predicted that attitude toward genetic cancer screening would be positively associated behavioral intent. This was found to be the case. Attitude toward genetic screening was positively related to intent to discuss genetic screening. H₆ predicted that attitude toward genetic cancer screening would mediate the expected effect of framed message on intent to discuss genetic cancer screening. But given that message frame had no influence on either attitude or behavioral intent, it would not be possible for attitude to mediate an effect of frame on behavioral intent. Indeed, a mediation analysis of this model found precisely that: attitude toward genetic screening did not (and could not) mediate a relationship between message frame and behavioral intent.

To summarize, frame in this model played no role in influencing attitude or behavioral intent. The only significant effect in this model was the relationship between attitude and behavioral intent.

6.3 Mediation of the influence of frame on attitude: fear and hope

The title of this study poses a question about whether fear or hope mediates the effectiveness of message frames used in genetic cancer screening appeals. Hypotheses addressed the role that emotions play in mediating the effect of message frame on attitude. Supplemental analyses (discussed in the next section) also addressed the role that emotions play in mediating the effect of message frame on behavioral intent. Analyses so far have revealed that up to this point, message frame appears to have played no role in influencing attitude or behavioral intent. But further discussion of the potential role of the titular emotions—hope and fear—is warranted.

A mediation model was presented in Chapter 2 that predicted mediation of the framing effect on attitude by fear and by hope (Figure 2). The assumption underlying this model was that both fear and hope would mediate the influence of message frame on attitude but to different degrees. It was expected that the fear-frame condition would lead to more fear, the emotion of fear would be positively related to attitude, and the frame would have an indirect effect on attitude via fear. Similarly, the model contained a pathway through which hope would mediate the relationship between frame and attitude. It was expected that the hope-frame would lead to greater hope, the emotion of hope would be positively related to attitude, and frame would have an indirect effect on attitude via hope. This model presumed that both fear and hope would have a mediating effect but that fear would be the stronger mediator, given that loss-framed fear appeals are more effective than gain-framed appeals at inducing a positive attitude toward health detection behaviors.

As noted, it was predicted that the fear framed message would elicit more fear than the hope message (addressed previously as H_{1b}), while H₇ predicted that fear would be positively associated with attitude toward genetic screening. The use of the fear frame did result in a

significantly higher level of fear being elicited, but there was no relationship between fear and attitude. Attention then turned to whether or not fear mediated the relationship between message frame and attitude. Put simply, the mediation suggested by this model could not occur due to the fact that there was no associative relationship between either message frame and attitude or between fear and attitude. Thus H₈, which predicted that fear would mediate the relationship between message frame and attitude was not supported.

With hope as the proposed mediator, the model made similar predictions as were made for fear as the proposed mediator. As expected (H_{2b}), it was determined that the hope framed message elicited more hope than the fear framed message. However, H₉, which predicted an association between hope and attitude, was not supported. Of greater importance to this study was H₁₀ which proposed that hope would mediate the relationship between frame and attitude. Once again, because there was no relationship between frame and attitude and also no relationship between fear and attitude, mediation could not be possible, rendering H₁₀ not supported.

Ultimately, the analyses revealed that the associations of both fear and hope with attitude were not significant and that neither hope nor fear mediated the relationship between message frame and attitude toward genetic screening. The study asked whether discrete emotions (fear and hope) would mediate message frame effectiveness in genetic cancer screening appeals. Based on these findings for attitude, the short answer to that question would appear to be “no.” In this study, people’s attitudes toward genetic cancer screening were not significantly influenced by the framed PSAs they watched, and the emotions they reportedly experienced (fear and hope) were unrelated to their attitudes toward genetic cancer screen. Thus, no mediation was

possible. However, there was a second outcome measure in this study: behavioral intention to discuss genetic cancer screening with a health care provider.

6.4 Supplemental analysis: The mediation of framing effect on intent by emotion

The primary focus of this study was on the role of emotion in mediating the effectiveness of genetic cancer screening appeals. It was hypothesized that emotions would mediate the influence of message frame on attitude, but this not was the case. To some extent, attitude was the primary outcome of interest because of its expected role in influencing behavior. For example, it has been stated multiple times in this paper that attitudes can affect behavioral intention (Shen & Dillard, 2007). The underlying assumption driving this study had been that if frame could directly affect attitude it could also therefore indirectly affect behavioral intent. As this study has shown, however, this did not occur. But the findings had shown that the emotions of fear and hope were both related to behavioral intent. The question was therefore asked, what if attitude were replaced in the mediation by emotion models by behavioral intent? Would emotions play a mediating role in such a model?

To answer this, a supplemental analysis was conducted that essentially removed attitude as the dependent variable and replaced it with behavioral intention. The supplemental model then examined the extent to which fear and hope mediated the effect of message frame. It was found that both fear and hope did mediate the relationship between message frame and behavioral intent. Although frame had no direct effect on behavioral intent, there was an indirect effect through both of the emotional responses. What this may suggest is that at least in the case of genetic cancer screening behaviors, the proposal that both hope and fear serve as mediators of the framing effect was not off the mark. Emotions did indeed have an effect on behavioral intent. It would also seem to suggest the focus on attitude as the primary outcome of interest may have

been somewhat misplaced, especially in light of the discovery that most respondents, regardless of experimental group, apparently already had a positive attitude toward genetic screening.

It also bears repeating that the recommended behavioral response in this study was the *discussion* of genetic cancer screening with a health care provider, not actual genetic testing itself. Part of the reason that the discussion of genetic cancer screening was chosen as the targeted behavior as opposed to actual genetic screening is that genetic cancer screening should almost always be undertaken under the guidance of a health care provider for a host of reasons previously discussed. The public service announcements used in this study therefore modeled the initiation of dialog about genetic cancer screening with a doctor and only peripherally discussed actual genetic screening so perhaps the primary outcome of interest in these mediation analyses should have been on intent to discuss genetic screening rather than on attitude toward genetic screening.

6.5 Theoretical implications

Much of the framing literature suggests that message frames often act through mediating variables to exert their influence on outcome variables. It has been well established that merely examining the effect of frame on a given outcome variable is not likely to advance framing theory. The initial findings from this study showed that frames by themselves did not account for significant differences in attitude or intent. In the first model, individuals who viewed the fear-framed video were not significantly more inclined to discuss genetic screening with their doctor than those who viewed the hope frame video nor were there significant differences in attitude toward genetic cancer screening among the different experimental groups. In other words, neither frame proved to be more effective.

Previous findings from framing literature support the idea that loss-framed messages are more effective than gain-framed messages at motivating people to adopt health detection behaviors. For example, when the outcome of a health behavior is not known or uncertain, as is the case with genetic cancer screening, people are more responsive to a loss-framed message that highlights the consequences of not adopting the behavior (Kahneman & Tversky, 1981; O'Keefe & Jensen, 2006). Based on this, it had been predicted that the fear-framed message would be more effective than the hope-framed message in influencing both attitude and behavioral intent. There are several possible explanations for why the emotion framing used in the study did not have the expected effect on attitude or behavioral intent.

First, regarding the effect of frame on attitude, it has already been argued in this paper that attitudes toward genetic cancer screening among respondents was already somewhat positive and this may have been a factor in why frame did not influence attitude. Recent findings suggest that people in general appear to have favorable attitudes toward genetic screening. For example, Henneman et al. (2013) reported that the benefits of genetic testing have increased among the public resulting in more popular opinions about genetic screening. While Morren et al., (2007) found that attitudes among genetic screening are generally positive. Since attitudes towards genetic screening among respondents was already high to begin with, it is possible that the fear PSA was no more effective than the hope PSA at raising attitudes toward genetic cancer screening. In addition, self-selection by participants may have played a role. Specifically, because the study dealt with genetic cancer screening, people who chose to participate may have been those who tended to have more positive attitudes towards that health behavior. Another possibility is that attitudes toward genetic screening were influenced by the relative novelty of the behavior. Unlike other health behaviors targeted by health appeals such as mammograms,

colonoscopies, or even skin cancer prevention, there appear to be relatively few communication campaigns addressing genetic cancer screening. It is possible that the relative newness of this topic in health appeals and the additional possibility that people simply do not know much about it led to people having a relatively positive attitude toward it. The positive attitudes toward genetic cancer screening could also be attributable to social desirability bias. In general, social desirability bias occurs when people either underreport undesirable activities and attitudes or overreport desirable activities and attitudes (Krumpal, 2013). If this were the case, it would mean that respondents' attitude toward genetic cancer screening was a function of their perceptions of it as a desirable attitude and therefore positive attitude would have been over reported.

The lack of a difference in attitudes toward genetic screening between the two experimental groups may also have been carried over into the lack of a difference in behavioral intent as well. It has already been argued that attitude can influence behavior. Since attitudes toward genetic screening did not significantly differ between the two experimental groups and attitude and behavioral intent are related, it is possible that behavioral intent among the experimental groups would not differ significantly either.

Another reason why there was no difference in attitude or behavioral intent between the two experimental groups may have been the way the behavior was modeled in both PSAs. Both appeals contained the same information on the importance of discussing genetic screening with doctor but it was presented in exactly the same way in each video—the same video footage of the behavior modeling was shown in each experimental PSA. Some have pointed out that fear appeals are more effective when they contain information that people can use to reduce the threat (Bastien, 2011; Tannenbaum, 2013). But these findings may not necessarily imply that fear

appeals containing such information are more effective than hope messages containing the same exact information. Because both groups were presented with identical content related to how to perform the targeted behavior, it is possible that this contributed to there being no difference in behavioral intent between the two experimental groups despite the fact that the messages were framed differently. If this was actually the case, people were responding to the behavioral modeling rather than the frame.

What these findings seem to suggest is two things. First, if attitude toward a behavior is already relatively positive, neither frame is likely to change those attitudes. Second, it would appear that in this case, the use of the exact same information and content on how to perform the behavior effectively in the fear message and the hope message may have neutralized the effect message frame may have had on behavioral intent. Regardless of message frame, respondents could have simply responded to both messages by thinking they could actually perform the message (high self-efficacy). Furthermore, because frame had no effect on attitude or intent, mediation by attitude was simply not possible in this model.

In terms of implications for framing theory, recall that accentuating certain aspects of health behaviors at the expense of others is the essence of framing (Hoffner & Ye, 2009). Certainly each experimental PSA developed for this study accentuated different aspects of the health behaviors, notably the outcomes. Yet, the aspect of the behavior itself was characterized identically in both messages. This would seem to suggest that the inclusion of identical information about how to perform the behaviors in these messages may have neutralized the effect that the differential framing of the consequences could have had on attitude or intent.

The second set of models in this study focused on determining whether hope and fear functioned as mediators of the framing effect on attitude. Both of these models predicted that the

discrete emotions would mediate the relationship between message frame and attitude toward genetic screening. Neither of these hypotheses were supported. This is because frame had no effect on attitude, meaning that the mediation proposed by these models could not take place.

Because mediation was not possible in these models, a supplemental analysis examined whether hope and fear could mediate the framing effect on behavioral intent. Earlier in this study it was determined that message frame did not have a significant direct effect on behavioral intent. However, the supplemental analysis found that the indirect effect of frame on behavioral intent through both hope and fear was significant. The question arises as to why hope and fear would mediate the relationship between message frame and intent but not the relationship between frame and attitude.

One possible reason for this was alluded to earlier in this chapter. Recall that the behavior of interest in this study was the *discussion* of genetic cancer screening with a health care provider. This is distinct from attitude toward genetic screening. Whereas attitudes toward genetic screening may have already been positive among respondents and thus not susceptible to influence by message frame, attitudes toward discussing genetic screening were not measured in this study and thus not known. It is possible that people could have actually had less positive attitudes toward discussing genetic screening before seeing the PSAs and that the interaction message frame and emotion led to increases in attitude toward that specific behavior as well as behavioral intent. This could have been verified had respondents been measured on their attitudes toward discussing genetic cancer screening. The implications of these findings for framing theory should be somewhat clear: framing studies examining mediation should ensure that attitudes and behavioral intent align. In other words, the attitude measured should correspond with the actual behavior to which the attitude applies. As it relates to emotions,

these findings do suggest that both positive and negative emotions can have an effect on intent to adopt health detection behaviors.

As a result of these findings, it can be said that this study did extend framing theory by identifying two variables, hope and fear, through which the framing effect was conveyed to a behavioral outcome. These findings suggest that both positive and negative emotions (in this case hope and fear) can lead to intent to adopt health detection behaviors, which challenges previous notions that loss-framed messages were more effective in that regard. Therefore this study's primary contribution to framing theory is that framing effects on behavioral intent related to discussing genetic cancer screening do in fact appear to be contingent on discrete emotions, specifically fear and hope.

6.6 Practical implications

Overall, this study found that both hope and fear mediated the relationship between message frame and behavioral intent. This immediately suggests that to some extent both hope and fear are beneficial and can influence behavioral intent. To be sure, this study found that both the hope-framed and the fear-framed messages led to increased behavioral intent relative to the control group and more specifically that the both hope and fear were indirectly responsible for the relationship between message frame and behavioral intent.

Evidence has already shown the value of hope in achieving healthy outcomes. As an emotion, hope is action oriented and can motivate and inspire people to achieve health-related goals (Prestin, 2013). Hope can also lead to the adoption of healthy behaviors. Snyder (2002) for example, found that high levels of hope led to stronger intention to engage in cancer prevention behaviors. What these findings as well as the findings of this study suggest is that the elicitation of hope can lead to desirable health behaviors. Likewise, one could make the

argument that utilizing hope appeals should be considered along with fear appeals in the promotion of health detection behaviors. This is a potentially notable discovery especially when one considers the potential negative consequences sometimes associated with fear appeals. For example, in some cases, fear appeals have been found to be counterproductive, leading to a boomerang effect where people actually adopt the maladaptive behaviors instead of the targeted behavior (Lennon, et al., 2010). Furthermore, there is some evidence that while fear appeals may increase motivation to engage in adaptive behaviors, that may not necessarily translate into behavioral adoption (Halkjelsvik et al., 2013). Certainly it has been pointed out that fear appeals often result in stronger negative emotional reactions and in some cases greater perceived susceptibility which may not always be desirable (Jones & Owen, 2006). These are all considerable negative consequences that perhaps some may be willing to accept because of the well-documented effectiveness of fear appeals. But this study has helped to demonstrate that health communicators and health appeals designers have a viable alternative to fear appeals: hope appeals. Certainly these findings contribute to work already conducted by Prestin (2013) and Nabi and Prestin (2016) that demonstrate the potential effectiveness of incorporating hope into health appeals.

None of this is to suggest that people should stop using fear appeals and start using only hope appeals. To be sure, this study provides only limited support of hope appeals that is specific to a single health detection behavior. What these findings do suggest is that perhaps the inclusion of hopeful elements in health appeals, especially those that address frightening health consequences such as cancer detection, may be as effective as simply trying to scare people into acting. Indeed, evidence in this study suggests that the fear-framed message may actually have

suppressed hope. If so, this could reduce some of the benefits that go along with the elicitation of hope.

This study has some implications for health messaging. In this case, the messages used in this study modeled a specific behavior but the study itself did not measure attitudes toward that specific behavior. Much has already been discussed about the possibility that attitudes toward genetic screening were relatively positive but this study did not examine people's attitudes about the topic of the PSA itself. Future research along these lines needs to make sure that attitudes toward the actual modeled behavior are measured.

Another potential implication of this study is that longer or more varied exposure to messages about genetic screening may be needed to impact attitudes or to have lasting effects on behavior. The PSAs in this study had running times of approximately two minutes. That is a relatively short amount of time to be exposed to a health message. While the results clearly indicate that the PSAs used in this study did lead to greater behavioral intent, it should not be assumed that these PSAs should be used by themselves. I would argue that repetition of the messaging through the use of supplementary materials promoting the discussion of genetic cancer screening with a physician should also be considered. This could come in the form of additional public service announcements, printed and web based materials, and other communication strategies that reinforce and provide greater exposure to such messaging. Furthermore, while communication alone (such as the experimental PSAs used in this study) can lead to increased knowledge about a health behavior, influence perceptions and beliefs, and demonstrate the benefits of behavioral change or adoption, additional strategies such as engaging partners in promoting the behaviors, working with health care providers to promote them, and engaging interpersonal communication about the behavior can lead to sustained

change (National Cancer Institute, 2002). This suggests that efforts to promote the discussion of genetic cancer screening should go far beyond a single PSA.

Another way to achieve greater exposure to and impact of the messages would be the use of entertainment education strategies. The Entertainment-Education (E-E) approach seeks to capitalize on the persuasive power of television to influence audiences to adopt healthy behaviors by embedding messages in mass media productions, storylines, and characters (Whittier, Kennedy, St. Lawrence, Seely, & Beck, 2005). In this case, narratives pertaining to the discussion of genetic cancer screening could be embedded into the storyline of a television show utilizing characters with whom the audience can identify. Entertainment education is an ideal way to use emotions such as hope or fear in relation to genetic cancer screening.

One final implication to be considered derives from the likelihood that more genetic tests will become available to the public in the future. As more genetic tests become directly available, there will be an increased need for effective communication efforts stressing the need to discuss such tests with health care professionals, especially as consumers may lack the knowledge to properly interpret the results of such tests.

In summary, the findings of this study suggest that health communicators should consider incorporating elements of hope in their messages targeting health detection behaviors. Whether that is the inclusion of hopeful messages within a classic fear appeal or an appeal specially designed to elicit hope although it is clear more research is needed to ascertain the effectiveness of hope appeals for health detection behaviors other than discussing genetic cancer screening with a health care provider.

6.7 Limitations

This study has several limitations. The first potential limitation relates to the survey itself. The survey asked about attitudes toward genetic screening, which was not actually the targeted behavior. This brings into question whether the survey should have instead sought to measure attitudes toward discussing genetic screening with their doctors which *was* the targeted behavior. Had attitude toward discussing genetic screening been measured, it could have been explored as a possible mediator of the framing effect. Perhaps a more appropriate model may have examined people's attitude toward the specific targeted behavior rather than attitudes toward genetic screening alone.

Another limitation may be related to the method through which participants were recruited and data was collected. This study relied on the use of Amazon's Mechanical Turk (MTurk) to recruit participants for the study. MTurk has become a popular option for data collection among social scientists (Holden, Dennie, & Hicks, 2013). In general, the participant pool of individuals (referred to in MTurk as "workers") aged 18 and older sign up to complete what are referred to as human intelligence tasks (HITs) for reimbursement (Johnson & Borden, 2012). Through MTurk, the study questionnaire was made available to anyone worldwide who had joined MTurk as "worker." In one sense this could be seen as a strength of the study. For example, unlike a lot of research that relies upon a relatively homogenous sample of college students, this study recruited from a much broader population that ranged in age from 18-74 and had respondents from all over the world. However, as Johnson and Borden (2012) point out, there is concern about the difficulty of controlling how much time MTurk participants spend on each section of the protocol. According to Johnson and Borden (2012) "the primary concern is often that the worker simply answers questions randomly or rushes through the study" (p. 249).

This must be considered a potential weakness of this study. Likewise, the length of time required of the participants to complete the survey (up to 25 minutes in some cases) may have led others to not complete the study or to lose interest in completing the questionnaire.

Another concern related to the use of MTurk involves self-selection bias. The opportunity to participate in this study was offered only to members of MTurk which could limit the generalizability of the findings despite the fact that they came from many countries and represented many ethnicities.

Another potential limitation was the use of all actors as spokespersons. As previously discussed, the messages may have been more effective if they had utilized spokespersons with actual experience related to the targeted behavior. For example, the hope PSA may have been more effective if in addition to having someone modeling the behavior, it also featured a spokesperson who had actually engaged in the behavior and had directly benefitted from adopting it. This may have led to respondents being more able to identify with and trust the spokesperson.

Additionally, this study did not assess the degree of risk perceived by the respondents. It asked only if they had relatives that had cancer, it did not examine the extent to which the respondents perceived their own risk of getting cancer. The extent to which they felt risk—which probably ranged from very little to a great deal—could very likely have influenced how they responded to these messages.

6.8 Future research

One line of future research should examine the mediating effect of attitude toward discussing genetic cancer screening with a health care provider rather than just simply the mediating effect of attitude toward genetic screening. Perhaps attitude toward the actual

behavior may have mediated the framing effect on behavioral intent whereas attitude toward genetic screening in general did not. After all, the targeted behavior in this study was initiating a conversation about genetic cancer screening with a doctor but the survey asked people not about their attitudes toward that behavior but rather for their attitudes toward genetic screening in general. Since the emotional appeals in this study specifically highlighted talking to a health care provider, future research should measure attitudes related to that specific behavior. To be sure, attitude toward genetic cancer screening was actually correlated with behavioral intent but it would have been more accurate to have included attitude toward the actual targeted behavior somewhere in the causal pathway and mediation analysis.

In addition, there were a number of other variables that were measured in this study for the purpose of future investigation, and which were therefore not included in the final analysis. For example, study participants were also assessed on the extent to which they utilized monitoring or blunting coping styles when presented with a potentially fear-causing situation using the Monitoring Blunting Questionnaire (Muris et al., 1994). In general, people who “monitor” seek out information to combat a threat while those who use “blunting” typically engage in information avoidance when presented with threatening information (Muris et al., 1994). Considering that the behavioral action targeted in this study (asking a doctor about genetic cancer screening) is essentially an information seeking behavior, a future line of framing research should examine the extent to which coping style can act as a mediator of framing effects on behavioral adoption.

Likewise, although not examined in the study reported here, respondents were asked about their levels of dispositional optimism using the Life Orientation Test Revised or LOT-R (Scheier, et al., 1994). The LOT-R measured the level of respondents’ dispositional optimism.

Future analysis should examine levels of dispositional optimism as a potential moderator of the framing effect in genetic cancer screening appeals.

There is also a possibility that other discrete emotions may mediate the effect of frame on attitude or behavioral intent. Morales et al., (2012) found that utilizing disgust (another negative emotion) increased the effectiveness of fear appeals. This certainly raises the question as to whether other positive emotions can increase the effectiveness of hope appeals. In this study respondents reported on seven different emotions including hope and fear. Future research should explore the possibility that other emotions, especially other positive emotions such as courage or even happiness, could influence the effectiveness of message frame

6.9 Conclusion

The present study was able to provide evidence that both hope and fear mediated the relationship between message frame and behavioral intent. In other words, both hope and fear appeared to be effective at transferring the effect of message frame onto behavioral intent. Therefore, this study makes a positive contribution to the field of framing research by showing that both hope and fear mediate the relationship between frame and behavioral intent. It also shows that both hope and fear can influence the adoption of health detection behaviors. But, much opportunity remains to test how these and other discrete emotions potentially mediate other health detection behaviors. Likewise, it remains to be seen if these emotions have the same mediating effect on other health detection behaviors, not to mention health prevention behaviors. Furthermore, there is still much to be learned about how these emotions interact with other potential mediators to influence behaviors.

In all likelihood, there are other mediating variables present in the supplemental models proposed in this study. Examination of other potential mediating variables represent viable

avenues for future framing research and will be essential to further advancing framing theory. But perhaps more importantly is that to some degree the findings of this study support other work (Prestin, 2013; Nabi & Prestin, 2016) that shows the effectiveness of hope appeals. This study also provides some evidence that begins challenge the notion that fear appeals are the most effective way to promote health detection behaviors. This is not to suggest that the current literature has concluded that fear appeals are the only effective method to promote health detection behaviors. Rather this is to say that another method to promote these types of behaviors has now been identified and that future research should also focus on the effectiveness of positive emotions and message frames to influence health behavior.

Much has been written about the negativity bias that has proliferated within the field of psychological research and earlier in this paper I made a similar argument about the presence of a negativity bias in communication research as evidenced by the extensive literature on fear appeals but the relative dearth of literature on positive emotional appeals. Perhaps the most exciting conclusion from this study is that it appears to demonstrate an alternative approach to the use of fear appeals in promoting health detection behaviors. The effectiveness and potential consequences of fear appeals is well documented but this study represents one of the first steps in examining the ability of “hope appeals” to influence health behaviors, especially health detection behaviors. Perhaps in future years, communications scholars can build contribute toward a strong evidence base for these types of positive appeals to the point that the term “hope appeals” becomes as ubiquitous as “fear appeals.”

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APPENDICES

Appendix A

Draft PSA scripts

Genetic Screening Message # 1: Fear-framed PSA script

A young woman is sitting in a doctor's office looking very nervous. Her husband is holding her hand.

Narrator (OC). Jenny's mother had cancer.

Close up of Jenny's face nervously smiling.

Narrator (OC). So did her grandmother.

Cut to nurse walking into waiting room.

Nurse (smiling): Jenny Mimms?

Jenny: Yes, that's me.

Nurse: The doctor will see you now.

Narrator (OC): But Jenny's not going to let that happen to her.

Doctor: So you've decided to go ahead with the genetic cancer screening we talked about last week.

Jenny: Yes. I have

Doctor: I'm so glad.

Jenny: But I'm a little nervous.

Doctor: Don't be nervous. Chances are we won't find anything abnormal. And if we do, we can put into place a plan that will help us better prevent you from getting cancer. So this test reduces your risk of dying prematurely.

Cut to: Doctor and Jenny Narrator talking in background

Narrator (OC): Today, Jenny is talking to her doctor to see if genetic cancer screening is right for her. Genetic cancer screening can alert Jenny's doctor to the possibility that she may be higher risk for mutations that cause cancer. She and her doctor can then do something about it... [Jenny smiles at doctor...doctor smiles back.]

Narrator: Today Jenny is taking steps to find out if she is at greater risk for cancer. But a lot of people aren't going to take those steps.

[Cut to shot of people in crowd walking around]

Narrator: As a result, they may learn too late that they were at increased risk for cancer and miss the chance to have done something about it.

[Cut to graveyard]

Narrator (OC): If you have a family history of breast, colon, ovarian, or thyroid cancer, talk to your doctor about genetic cancer screening...before it's too late.

Genetic Screening Message # 2: Hope-framed PSA script

A young woman is sitting in a doctor's office looking very nervous. Her husband is holding her hand.

Narrator (OC). Jenny's mother had cancer.

Close up of Jenny's face nervously smiling.

Narrator (OC). So did her grandmother.

Cut to nurse walking into waiting room.

Nurse (smiling): Jenny Mimms?

Jenny: Yes, that's me.

Nurse: The doctor will see you now.

Narrator (OC): But Jenny's not going to let that happen to her.

Doctor: So you've decided to go ahead with the genetic cancer screening we talked about last week.

Jenny: Yes. I have

Doctor: I'm so glad.

Jenny: But I'm a little nervous.

Doctor: Don't be nervous. Chances are we won't find anything abnormal. And if we do, we can put into place a plan that will help us better prevent you from getting cancer. So this test really gives you hope for a more healthy future.

Cut to: Doctor and Jenny Narrator talking in background

Narrator (OC): Today, Jenny is talking to her doctor to see if genetic cancer screening is right for her. Genetic cancer screening can alert Jenny's doctor to the possibility that she may be higher risk for mutations that cause cancer. She and her doctor can then do something to help prevent it or detect it sooner. [Jenny smiles at doctor...doctor smiles back.]

Cut to...Jenny walking with her husband on wooded trail, smiling.

[Narrator (OC): If you have a family history of breast, colon, ovarian, or thyroid cancer, you don't need to be afraid...there is hope. Talk to your doctor about genetic cancer screening.

Appendix B

First Pilot test focus group questions and survey

Focus group moderator's guide / survey

Script pilot testing focus group moderator's guide

[Prior to beginning the focus group I will distribute an informed consent form to each participant and say the following]:

Your participation in this discussion is voluntary. You may leave the discussion at any time. Your names will not be used in any report. I ask that all participants keep this discussion, in particular, what others say confidential. I cannot, however, guarantee confidentiality.

Please read the Consent Form. Do you have any questions about this consent form or how this discussion will work?

If you agree to participate, please sign and date the informed consent form.

Moderator: Thank you for joining me today. My name is Matt Sones and I am a PhD student at Georgia State University. I am doing a study on the way different emotions effect how people respond to health messages. As a part of this study, I will be producing two short public service announcements (aka PSAs) on the importance of genetic cancer screening for people with a family history of cancer.

Today, I'm going to show you one of the scripts I have written for these PSAs. After you have read through the script, I am going to ask you for your feedback and opinion on these script and the messages that are in the script. It is important to hear people's feedback before I produce these PSAs.

Before I get started, I'm going to take a few minutes to go over some things you need to know about this discussion.

First, there are no right or wrong answers—I'm just looking for your opinions. I will not be offended by any opinions you share with me.

I will be taking notes so that I may refer back to it after the focus groups. I will also be recording this discussion to help me better understand your answers. Once this study is done, I will delete the audio recording of this group.

To make sure that I hear and understand what everyone has to say, it's important that you speak one at a time.

Our discussion will take approximately one hour. I don't want to keep you here longer than that so I may interrupt to keep us on track.

Please turn off your cellphones or put the ringer on silent.

[Begin focus group questions]

Focus group questions for pilot testing of script (Adapted from CDC's Health Message Testing System, HMTS, U.S. Centers for Disease Control and Prevention, 2011). [Note I will ask each question for both of the scripts.]

I have given you a copy of a draft script for a short (60 second) public service announcement. Please take a few minutes now to read the script. Afterward, I will be asking you some questions about the script.

[When everyone has finished]

First, I want to ask you about the emotional tone of the script you just read. I'm going to hand out a very short questionnaire that asks you to rate what emotional tone the script conveyed. [I will hand out a separate survey form at this time which is in another attachment]

Please rate the extent to which the messages in the script made you feel the following emotions. Rate each emotion listed below on a 5-point scale where 0 = none of this feeling and 4 = a lot of this feeling

Worry	0	1	2	3	4
	None of this feeling				A lot of this feeling
Sadness	0	1	2	3	4
	None of this feeling				A lot of this feeling
Hope	0	1	2	3	4
	None of this feeling				A lot of this feeling

Anger	0	1	2	3	4
	None of this feeling				A lot of this feeling
Courage	0	1	2	3	4
	None of this feeling				A lot of this feeling
Happiness	0	1	2	3	4
	None of this feeling				A lot of this feeling
Fear	0	1	2	3	4
	None of this feeling				A lot of this feeling
Confusion	0	1	2	3	4
	None of this feeling				A lot of this feeling

I will now collect your responses.

[Collect the surveys]

Next I would like to ask you a few questions about the script.

1. What is the main idea that this message is trying to get across, in your own words?
2. How well do you think the main ideas come across?
3. What action would the message prompt you to take?
4. What words were unusual or unfamiliar in the script? What words could be used in their place?
5. Is there anything confusing, unclear, or hard to understand?
6. What are your perceptions of this message? Anything positive? Anything negative?
7. Is this message believable or not? Why or why not?
8. Is this message credible or not? Why or why not?
9. I found this message interesting. Why or why not?
10. Do you think this message focuses more on the benefits of talking to your doctor about genetic cancer screening or the consequences of not talking to your doctor about it?
11. How could this message be improved?

Moderator: That is all the questions I have for you. Do you have any questions for me? [If none then thank them for their participation]

END OF FOCUS GROUP

Appendix C

Recruitment messages for pilot test focus groups (Phase I)

Recruitment message for GSU students

Script to alert the class to the email invitation (All students will also receive the email invitation, which is the main recruitment message):

I want to let you know that you will soon be receiving an email invitation to participate in a focus group research study that explores people's emotional responses to a public service announcement on genetic cancer screening. The study, which is conducted by Dr. Cynthia Hoffner and Matt Sones in the Department of Communication, involves participating in a focus group to discuss the script for the public service announcement. The focus group will take approximately one hour.

Participating in the study is voluntary. For your participation, you will receive extra credit in one course: 2 percent of the total points available in the course. If you decide not to participate but would still like to earn the extra credit, the research invitation describes an alternative way to earn the extra credit.

The invitation also contains more details about the study as well as the contact information for the researchers if you have any questions. So, expect to receive this invitation, forwarded to your GSU student email address, in the next day or two.

The researchers plan to conduct the focus groups on the GSU campus on [date and time TBD]

Recruitment Message: Email Invitation for GSU Students:

Subject Heading: Emotional responses to genetic cancer screening ad – Invitation to Participate in Research

Dear Student,

This email is an invitation to participate in a focus group research study that we are doing at GSU. The study explores people's emotional responses to a genetic cancer screening public service announcement. This study involves participating in a focus group with 6-8 other students to read and discuss the script for a proposed public service announcement on genetic cancer screening. Participation in the focus group will take you approximately one hour.

A total of 32 participants will be recruited for this focus group study. You are invited to participate because you are a college student. Participating in this research is voluntary, and may not benefit you personally.

For your participation in the research, you will receive extra credit in one course: 2 percent of the total points available in the course will be given to you. If you decide not to participate but

would still like to earn the extra credit, you can review a short article related to your course and write a 2-page response paper. To take advantage of this option, please notify the principal investigator by email before the survey closes.

To participate in focus group, you will click the link below to [link to Sign up Genius form] sign up for a focus group session.

Link to focus group sign up [Sign up genius]

Please feel free to contact us with any questions. Thank you for considering your participation in this research.

Sincerely,

Matt Sones, Student Principal Investigator
Cynthia Hoffner, Professor and Principal Investigator
Department of Communication, Georgia State University
Contact information: sones@bellsouth.net or 770-403-1342

Recruitment message for recruiting from church (Phase I focus group)

Good evening / Good morning.

My name is Matt Sones. I am a parishioner here at St. Stephens. I am also a PhD candidate in communication at Georgia State University. I am here today to invite any adult aged 18 or over to participate in a focus group research study that I am doing at Georgia State to earn my PhD. This study explores people's emotional responses to a genetic cancer screening public service announcement. This study involves participating in a focus group with 6-8 volunteers to read and discuss the script for a proposed public service announcement on genetic cancer screening. Participation in the focus group will take you approximately one hour and will take place following this announcement.

A total of 32 participants will be recruited for this focus group study. Participating in this research is voluntary, and may not benefit you personally.

If you would like to participate in this focus group today please see me at the table where I can sign you up for the focus group.

Thank you for considering participation in this research.

Appendix D

Pilot test consent forms (Phase I)

Informed Consent form (GSU focus groups)

**Georgia State University
Department of Communication
Informed Consent (Focus Group)**

Title: Responses to genetic cancer screening appeals

Principal Investigator: Cynthia Hoffner, Ph.D.

Student Principal Investigator: Matthew Sones, MPH

Purpose: You are invited to volunteer in a research study. The purpose of this study is to investigate how people respond emotionally to short public service announcements. You are invited to participate because you are potentially a member of the target audience for this public service announcement (adult aged 18 or older). A total of 32 people will be recruited for the study. Participation will require approximately one hour of your time.

Procedures: If you decide to participate you will be participating in an hour-long focus group with approximately 6-8 people to talk about a script for a public service announcement related to cancer. During your participation you will first read the script for the public service announcement. You will then complete a very short survey asking you to describe how the script made you feel. The student principal investigator will ask you questions about how the script made you feel. He will also ask you if you thought the script was persuasive and easy to understand. Your answers will help the study team improve the script. The focus group will be audio recorded in order to help the student researcher better understand what you say.

Risks: In this study, you will not have any more risks than you would in a normal day of life. However, it may be emotionally uncomfortable to reflect on the experience of having cancer.

Benefits: Participating in this study may not benefit you personally. Overall, we hope to gain information about how to produce more effective public service announcements.

Voluntary Participation and Withdrawal: Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may stop participating in the focus group at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

Confidentiality: We will keep your records private to the extent allowed by law. Dr. Hoffner and the research team will have access to the information you provide. Information may also be shared with those who make sure the study is done correctly (GSU Institutional Review Board, the Office for Human Research Protection (OHRP)). No names will be used in study. A number will be assigned to each participant by the focus group moderator (student investigator) only to

help to facilitate the focus group. The short survey you will take during the focus group will not ask for any personal information. Data will be stored on the Student PI's firewall-protected computer in a locked office. He will delete the audio file of the focus group once the study is finished. Please do not reveal what was discussed during the focus group. But please be aware that, because of the nature of focus groups, the researchers do not have complete control of the confidentiality of the data. Your name and other facts that might point to you will not appear when we present this study or publish its results. The findings will be summarized and reported in group form. You will not be identified personally.

Contact Persons: Contact Dr. Cynthia Hoffner, at choffner@gsu.edu or 404-513-5650 if you have any questions, concerns, complaints about this study. You can also call if you think you have been harmed by the study. Call Susan Vogtner in the Georgia State University Office of Research Integrity at 404-413-3513 or svogtner1@gsu.edu if you want to talk to someone who is not part of the study team. You can talk about questions, concerns, offer input, obtain information, or suggestions about the study. You can also call Susan Vogtner if you have questions or concerns about your rights in this study.

Copy of Consent Form to Subject

We will give you a copy of this consent form to keep.

If you are willing to volunteer for this research and be audio-recorded, please sign below.

Participants

Date

Principal Investigator or Researcher Obtaining Consent

Date

Informed Consent form (Church focus groups)

Georgia State University Department of Communication Informed Consent (Focus Group)

Title: Responses to genetic cancer screening appeals

Principal Investigator: Cynthia Hoffner, Ph.D.

Student Principal Investigator: Matthew Sones, MPH

Purpose: You are invited to volunteer in a research study. The purpose of this study is to investigate how people respond emotionally to short public service announcements. You are invited to participate because you are potentially a member of the target audience for this public service announcement (adult aged 18 or older). A total of 32 people will be recruited for the study. Participation will require approximately one hour of your time.

Procedures: If you decide to participate you will be participating in an hour-long focus group with approximately 6-8 people to talk about a script for a public service announcement related to cancer. During your participation you will first read the script for the public service announcement. You will then complete a very short survey asking you to describe how the script made you feel. The student principal investigator will ask you questions about how the script made you feel. He will also ask you if you thought the script was persuasive and easy to understand. Your answers will help the study team improve the script. The focus group will be audio recorded in order to help the student researcher better understand what you say.

Risks: In this study, you will not have any more risks than you would in a normal day of life. However, it may be emotionally uncomfortable to reflect on the experience of having cancer.

Benefits: Participating in this study may not benefit you personally. Overall, we hope to gain information about how to produce more effective public service announcements.

Voluntary Participation and Withdrawal: Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may stop participating in the focus group at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

Confidentiality: We will keep your records private to the extent allowed by law. Dr. Hoffner and the research team will have access to the information you provide. Information may also be shared with those who make sure the study is done correctly (GSU Institutional Review Board, the Office for Human Research Protection (OHRP)). No names will be used in study. A number will be assigned to each participant by the focus group moderator (student investigator) only to help to facilitate the focus group. The short survey you will take during the focus group will not ask for any personal information. Data will be stored on the Student PI's firewall-protected computer in a locked office. He will delete the audio file of the focus group once the study is finished. Please do not reveal what was discussed during the focus group. But please be aware

that, because of the nature of focus groups, the researchers do not have complete control of the confidentiality of the data. Your name and other facts that might point to you will not appear when we present this study or publish its results. The findings will be summarized and reported in group form. You will not be identified personally.

Contact Persons: Contact Dr. Cynthia Hoffner, at choffner@gsu.edu or 404-513-5650 if you have any questions, concerns, complaints about this study. You can also call if you think you have been harmed by the study. Call Susan Vogtner in the Georgia State University Office of Research Integrity at 404-413-3513 or svogtner1@gsu.edu if you want to talk to someone who is not part of the study team. You can talk about questions, concerns, offer input, obtain information, or suggestions about the study. You can also call Susan Vogtner if you have questions or concerns about your rights in this study.

Copy of Consent Form to Subject

We will give you a copy of this consent form to keep.

If you are willing to volunteer for this research and be audio-recorded, please sign below.

Participants

Date

Principal Investigator or Researcher Obtaining Consent

Date

Strongly disagree								Strongly agree
6.	I like the way the ad looks							
0	1	2	3	4	5		6	
Strongly disagree								Strongly agree
7.	I can do what the ad suggests							
0	1	2	3	4	5		6	
Strongly disagree								Strongly agree
8.	The ad was convincing							
0	1	2	3	4	5		6	
Strongly disagree								Strongly agree
9.	The ad grabbed my attention							
0	1	2	3	4	5		6	
Strongly disagree								Strongly agree
10.	The ad was confusing							
0	1	2	3	4	5		6	
Strongly disagree								Strongly agree
11.	The message was credible							
0	1	2	3	4	5		6	
Strongly disagree								Strongly agree
12.	The message was persuasive							
0	1	2	3	4	5		6	
Strongly disagree								Strongly agree

Now we have some questions about you, to help us understand your responses:

1. Has anyone in your family (parent, sibling, aunt, uncle, cousin, grandparent) had breast, cervical, ovarian, tubal, peritoneal, colon, or thyroid cancer? Yes / No
2. Have you had breast, cervical, ovarian, tubal, peritoneal, colon, or thyroid cancer? Yes/ No
3. Have you received any type of genetic testing our genetic counseling for cancer at any time in the past? Yes / No

4. Have you talked to your doctor about genetic cancer screening for yourself? Yes/ No
5. Are you female or male? _____ Female _____ Male
6. How old are you _____ Age
7. With what race / ethnicity do you most closely identify? (Choose any that apply)
____East Asian/Pacific Islander ____Hispanic/Latino(a) ____White/Caucasian
____Black/African American ____Native American ____ Other

Thank you for your participation in this survey.

Appendix F

Pilot test 2 recruitment message

Script to alert the class to the email invitation (All students will also receive the email invitation, which is the main recruitment message):

I want to let you know that you will soon be receiving an email invitation to participate in a research study that explores people's emotional responses to a public service announcement on genetic cancer screening. The study, which is conducted by Dr. Cynthia Hoffner and Matt Sones in the Department of Communication, involves watching a 2-minute public service announcement (PSA) on genetic cancer screening online and taking an online survey about your responses to the PSA. The survey should take approximately 10 minutes.

Participating in the study is voluntary. For your participation, you will receive extra credit in one course: 0.5 percent of the total points available in the course. If you decide not to participate but would still like to earn the extra credit, the research invitation describes an alternative way to earn the extra credit.

The invitation also contains more details about the study and a link to the survey which will open on March 22, 2016 as well as the contact information for the researchers if you have any questions. So, expect to receive this invitation, forwarded to your GSU student email address, in the next day or two.

Appendix G

Pilot test 2 Consent Form

Informed Consent form

**Georgia State University
Department of Communication
Informed Consent (Post-Production Pilot Test)**

Title: Responses to genetic cancer screening appeals

Principal Investigator: Cynthia Hoffner, Ph.D.

Student Principal Investigator: Matthew Sones, MPH

Purpose: You are invited to volunteer in a research study. The purpose of this study is to investigate how people respond to short public service announcements about cancer. You are invited to participate because you are a communication student at Georgia State University. A total of 20 people will be recruited for the study. Participation will require approximately ten minutes of your time.

Procedures: If you decide to participate, you will watch a short 2-minute public service announcement (PSA) about cancer online and then will take a very short online survey asking about your responses to the PSA. Participation in this study will require about 10 minutes. Participants will receive extra credit in one course equal to 0.5 percent of the total points available in the course. Those not participating or ineligible who would still like to earn the extra credit, may review a short article related to the course and write a half-page response paper.

Risks: In this study, you will not have any more risks than you would in a normal day of life. However, it may be emotionally uncomfortable to reflect on the experience of having cancer.

Benefits: Participating in this study may not benefit you personally. Overall, we hope to gain information about how to produce more effective public service announcements.

Voluntary Participation and Withdrawal: Participation in this research is voluntary. If you decide not to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

Confidentiality: We will keep your records private to the extent allowed by law. We will not ask you for any identifying information. IP addresses will not be collected for this study. Because this is an online study, however, data sent over the Internet may not be secure. Therefore, we cannot guarantee anonymity. Dr. Cynthia Hoffner and Matt Sones will have access to the information you provide. Information may also be shared with those who make sure the study is done correctly (GSU Institutional Review Board, the Office for Human Research Protection (OHRP)). Data will be stored on the Student PI's firewall-protected computer in a locked office.

We will use a survey number rather than your name on study records. Your name and other facts that might point to you will not appear when we present this study or publish its results. The findings will be summarized and reported in group form. You will not be identified personally.

Contact Persons: Contact Dr. Cynthia Hoffner, at choffner@gsu.edu or 404-513-5650 if you have any questions, concerns, or complaints about this study. You can also call if you think you have been harmed by the study. Call Susan Vogtner in the Georgia State University Office of Research Integrity at 404-413-3513 or svogtner1@gsu.edu if you want to talk to someone who is not part of the study team. You can talk about questions, concerns, or suggestions about the study. You can also call Susan Vogtner if you have questions or concerns about your rights in this study.

Copy of Consent Form to Subject

If you would like to keep a copy of the consent form, please print a copy.

If you are 18 or older, and willing to volunteer for this research, please click the “I agree” button below.

I agree

I decline

[If decline, the individual will see the following message]

“Thank you for your interest in this study.”

Appendix H

Main study recruitment message (MTurk recruitment message)

Project Name (not displayed to workers): Public Service Announcement Study

Title: Complete a Survey about a short public service announcement video

Description: This study examines how people respond to a public service announcement. The public service announcement may be about cancer or energy conservation.

Keywords: Cancer, genetic screening, energy conservation, public service announcements,

Reward per assignment: 40 cents

Time: 25 Minutes

HIT expires in: 7 days

Auto-approve and pay workers in: 2 days

Invitation:

Researchers at Georgia State University are conducting academic research on how people respond differently to public service announcements (short television ads). The study seeks to understand what responses have to these types of ads. The survey will take 20 to 25 minutes to complete.

Anyone can participate who is at least 18 years old. By participating in this study, you will not have any more risks than you would in a normal day of life. However, it may be emotionally uncomfortable to reflect on the possibility of dying of cancer. IRB approval is on file for this study. Select the link below to complete the survey.

When you have finished the survey, please enter your Mechanical Turk Worker ID **in the box on the last survey page**, to receive 40 cents payment. After it's confirmed that you completed the survey, your payment will be transferred to your MTurk account.

Appendix I

Main Study Informed Consent Form

Informed Consent Form

**Georgia State University
Department of Communication
Informed Consent (Main Study)**

Title: Responses to genetic cancer screening appeals

Principal Investigator: Cynthia Hoffner, Ph.D.

Student Principal Investigator: Matthew Sones, MPH

Purpose: You are invited to volunteer in a research study. The purpose of this study is to learn more about how people respond to public service announcements. You are invited to be in the study because you are registered with MTurk. You also must be an adult aged 18 or older. We will ask up to 1000 people to be in this study. The study will take about 20 to 25 minutes.

Procedures: If you decide to be in this study, you will watch a public service announcement (PSA). The video will be about 2-minutes long. The PSA may be about genetic cancer screening or energy conservation. Before watching the video you will be asked some questions about your personality. After watching the video you will be asked about your responses to the video. You will also be asked for your thoughts and attitudes about cancer. These activities will take place online using Survey Monkey. Your participation will require about 20 to 25 minutes. Forty cents will be deposited to your MTurk account after completing the online surveys.

Risks: In this study, you will not have any more risks than you would in a normal day of life. However, it may be emotionally uncomfortable to reflect on the possibility of dying of cancer.

Benefits: Being in this study may not help you personally. But we hope to learn more how to design public service announcements.

Voluntary Participation and Withdrawal: Participation in this research is voluntary. You have the right to drop out of the study at any time. You may skip questions or stop participating at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

Confidentiality: We will keep your records private to the extent allowed by law. We will not ask you for any identifying information. IP addresses will not be collected for this study. Because this is an online study, however, data sent over the Internet may not be secure. Therefore, we cannot guarantee anonymity. Dr. Cynthia Hoffner and Matt Sones will have access to the information you provide. Information may also be shared with those who make sure the study is done correctly. These include the GSU Institutional Review Board and the Office for Human Research Protection. Data will be stored on the Student PI's firewall-protected computer. The

computer is in his locked office. The findings will be summarized and reported in group form. You will not be identified personally.

Contact Persons: Contact Dr. Cynthia Hoffner, at choffner@gsu.edu or at 404-513-5650 if you have any questions, concerns, complaints about this study. You can also call if you think you have been harmed by the study. If you want to talk to someone who is not part of the study team, you can call Susan Vogtner. She is in the Georgia State University Office of Research Integrity. You can reach Susan Vogtner at 404-413-3513 or svogtner1@gsu.edu. You can talk about questions, concerns, or suggestions about the study. You can also call Susan Vogtner if you have questions or concerns about your rights in this study.

Copy of Consent Form to Subject

If you would like to keep a copy of the consent form, please print a copy.

If you are 18 or older, and willing to volunteer for this research, please click “I agree”.

I agree

I decline

[If decline, the following message will appear]

“Thank you for your interest in this study.”

Appendix J

Debriefing message

Debriefing Statement #1

[To be shown to all main study participants who watched one of the two genetic cancer screening PSAs at the completion of their survey]

Thank you for participating in this study. During this study you watched a short video on the importance of genetic cancer screening for some people, and also answered questions related to genetic cancer screening. We understand that talking about cancer and people's risk for cancer can be hard. We also understand that you may have more questions about genetic cancer screening. If you would like to find out more about genetic cancer screening, the American Cancer Society has some excellent information on their website. Please click on the following link if you would like to know more.

Genetic testing: What you need to know.

<http://www.cancer.org/cancer/cancercauses/geneticsandcancer/geneticTesting/genetic-testing-what-you-need-to-know-toc>

Debriefing Statement #2

[To be shown to main study participants in the control group who didn't see either cancer screening PSA]

Thank you for participating in this study. In this study, you answered questions related to genetic cancer screening. We understand that talking about cancer and people's risk for cancer can be hard. We also understand that you may have more questions about genetic cancer screening. If you would like to find out more about genetic cancer screening, the American Cancer Society has some excellent information on their website. Please click on the following link if you would like to know more.

Genetic testing: What you need to know.

<http://www.cancer.org/cancer/cancercauses/geneticsandcancer/geneticTesting/genetic-testing-what-you-need-to-know-toc>

Appendix K

Final PSA scripts

Genetic Screening Message # 1: Fear-framed PSA script

PROLOGUE

A very sickly young man is sitting. He has a nasal cannula attached to his face and a cap on his head. He is laboring to breathe.

Narrator (OC): Steve was diagnosed with terminal cancer 6 months ago. He also found out that he carries a gene that probably increased his cancer risk. But he never knew that...until it was too late.

CUT TO

A young woman is sitting in a doctor's office looking very nervous.

Narrator (OC). Jenny's mother had cancer.

Close up of Jenny's face nervously smiling.

Narrator (OC). So did her grandmother.

Cut to nurse walking into waiting room.

Nurse (smiling): Jenny Mimms?

Jenny: Yes, that's me.

Nurse: The doctor will see you now.

Narrator (OC): But Jenny's not going to let that happen to her.

Doctor: So you've decided to go ahead with the genetic cancer screening we talked about last week.

Jenny: Yes. I have

Doctor: I'm so glad.

Jenny: But I'm a little nervous.

Doctor: Don't be nervous. Chances are we won't find anything abnormal. And if we do, we can put into place a plan that will help us better prevent you from getting cancer. So this test reduces your risk of dying prematurely.

Cut to: Doctor and Jenny Narrator talking in background

Narrator (OC): Today, Jenny is talking to her doctor to see if genetic cancer screening is right for her. Genetic cancer screening is a simple blood or saliva test that can alert Jenny's doctor to the possibility that she may be at higher risk for cancer. She and her doctor can then do something about it... [Jenny smiles at doctor...doctor smiles back.]

Narrator: Today Jenny is taking steps to find out if she is at greater risk for cancer. Steve never took that step.

{EPILOGUE}

[Cut back to Steve] Don't let this happen to you.

Narrator (OC): If you have a family history of breast, colon, ovarian, or thyroid cancer, talk to your doctor about genetic cancer screening...before it's too late.

Genetic Screening Message # 2: Hope-framed PSA script

PROLOGUE—

A young man is jogging along the trail.

Narrator (OC): Steve recently found out that he has a gene that makes it more likely that he will get cancer. But he has hope. He is not afraid.

CUT TO:

A young woman is sitting in a doctor's office looking very nervous.

Narrator (OC). Jenny's mother had cancer.

Close up of Jenny's face nervously smiling.

Narrator (OC). So did her grandmother.

Cut to nurse walking into waiting room.

Nurse (smiling): Jenny Mimms?

Jenny: Yes, that's me.

Nurse: The doctor will see you now.

Narrator (OC): But Jenny's not going to let that happen to her.

Doctor: So you've decided to go ahead with the genetic cancer screening we talked about last week.

Jenny: Yes. I have

Doctor: I'm so glad.

Jenny: But I'm a little nervous.

Doctor: Don't be nervous. Chances are we won't find anything abnormal. And if we do, we can put into place a plan that will help us better prevent you from getting cancer. So this test really gives you hope for a more healthy future.

Cut to: Doctor and Jenny Narrator talking in background

Narrator (OC): Today, Jenny is talking to her doctor to see if genetic cancer screening is right for her. Genetic cancer screening is a simple blood or saliva test that can alert Jenny's doctor to the possibility that she may be at higher risk for cancer. She and her doctor can then do something to help prevent it or detect it sooner. [Jenny smiles at doctor...doctor smiles back.]...

EPILOGUE

Cut to... Steve smiling jubilantly at the sunset.

Narrator (OC): Just like Steve is doing now.

[Narrator (OC): If you have a family history of breast, colon, ovarian, or thyroid cancer, you don't need to be afraid...there is hope. Talk to your doctor about genetic cancer screening.

Appendix L

Main Study Questionnaire

****[All respondents completed Section A BEFORE watching the PSA]**

Section A

Revised Life Orientation Test (LOT-R) (Scheier, Carver, & Bridges, 1994)

Instructions:

Please answer the following questions about yourself by indicating the extent of your agreement by using the following scale:

- [0] = strongly disagree
- [1] = disagree
- [2] = neutral
- [3] = agree
- [4] = strongly agree

Be as honest as you can throughout, and try to not let your responses to one question influence your response to another question. There are no right or wrong answers.

- ___ 1. In uncertain times, I usually expect the best.
- ___ 2. It's easy for me to relax.
- ___ 3. If something can go wrong for me, it will.
- ___ 4. I'm always optimistic about my future.
- ___ 5. I enjoy my friends a lot.
- ___ 6. It's important for me to keep busy.
- ___ 7. I hardly ever expect things to go my way.
- ___ 8. I don't get upset too easily.
- ___ 9. I rarely count on good things happening to me.
- ___ 10. Overall, I expect more good things to happen to me than bad

Measure of information seeking / need for cognition Monitoring Blunting Questionnaire (Muris et al., 1994)

Instructions: In a threatening situation people can make use of two sorts of coping strategies: the monitoring strategy and the blunting strategy. When being in a threatening situation, both strategies can be used alternately.

The characteristics of the monitoring strategy are:

- (1) The person looks for information within the threatening situation by carefully paying attention to what is happening.

[SHOW VIDEO HERE]

****[All respondents completed Section B AFTER viewing the PSA, and were then directed to subsequent sections based on their personal and family history of cancer]**

Section B (All respondents)

Measures of emotion (adapted from Dillard, et al., 1996)

Instructions: Please rate the extent to which you are feeling each of the following emotions. For each one, use a 5-point response scale where 0 = none of this feeling to 4 = a lot of this feeling.

Worried	0	1	2	3	4
	None of this feeling				A lot of this feeling
Puzzled	0	1	2	3	4
	None of this feeling				A lot of this feeling
Hopeful	0	1	2	3	4
	None of this feeling				A lot of this feeling
Angry	0	1	2	3	4
	None of this feeling				A lot of this feeling
Courageous	0	1	2	3	4
	None of this feeling				A lot of this feeling
Dejected	0	1	2	3	4
	None of this feeling				A lot of this feeling
Happy	0	1	2	3	4
	None of this feeling				A lot of this feeling
Afraid	0	1	2	3	4
	None of this feeling				A lot of this feeling
Confused	0	1	2	3	4
	None of this feeling				A lot of this feeling
Irritated	0	1	2	3	4
	None of this feeling				A lot of this feeling
Joyful	0	1	2	3	4
	None of this feeling				A lot of this feeling
Sad	0	1	2	3	4
	None of this feeling				A lot of this feeling
Fearless	0	1	2	3	4
	None of this feeling				A lot of this feeling

1. Is there a particular doctor's office, clinic, health center, or other place that you go if you are sick or need advice about your health?

Yes No

2. If no, what is the main reason you do not have a usual source of health care?

- a. Seldom or never gets sick
- b. Recently moved into area
- c. Don't know where to go for care
- d. Usual source of medical care in my area is no longer available
- e. Can't find provider who speaks my language
- f. I like to go to different places for different health needs
- g. Just changed insurance plans
- h. Don't use doctors / treat myself
- i. Cost of medical care
- j. No health insurance
- k. Other

3. How difficult is it for you to get to your health care provider?

- a. Very difficult
- b. Somewhat difficult
- c. Not too difficult
- d. Not at all difficult

Measure of access to health insurance

Access to health insurance will be measured using items adapted from the 2015

American Community Survey (U.S. Department of Commerce, 2015)

Instructions: Please answer the following questions about your access to health insurance.

Are you currently covered by any of the following types of health insurance or health coverage plans? *Mark yes or no for each type of coverage in items a – h.*

- | | <i>Yes</i> | <i>No</i> |
|---|------------|-----------|
| a. Insurance through a current or former employer or union | ___ | ___ |
| b. Insurance purchase directly from insurance company | ___ | ___ |
| c. Medicare, for people 65 and older or people with certain Disabilities | ___ | ___ |
| d. Medicaid, medical assistance, or any kind of government Assistance plan for those with low incomes or a disability | ___ | ___ |
| e. TRICARE or other military health care | ___ | ___ |
| f. VA (including those who have never enrolled for VA care) | ___ | ___ |
| g. Indian Health Service | ___ | ___ |
| h. Any other type of health insurance or coverage plan | ___ | ___ |

Demographic Questions

1. Are you female or male? ___ Female ___ Male
2. How old are you _____ Age
3. With what race / ethnicity do you most closely identify? (Choose any that apply)
 ___ East Asian/Pacific Islander ___ Hispanic/Latino(a) ___ White/Caucasian
 ___ Black/African American ___ Native American ___ Other
4. In what country do you currently reside in? [Drop down list of countries]
5. In what country were you born? [Drop down list of countries]
6. Is there anything else you would like to tell us about your experiences or thoughts regarding cancer or genetic cancer screening? [Text box]