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Action Tendency Emotions Evoked by Memorable Breast Cancer Messages and Their Association With Prevention and Detection Behaviors

Sandi W. Smith¹, Lauren M Hamel², Michael R. Kotowski³, Samantha Nazione¹, Carolyn LaPlante¹, Charles K. Atkin¹, Cynthia Stohl⁴, and Christine Skubisz⁵

¹ Department of Communication, Michigan State University ² Department of Psychology, University of Limerick ³ School of Communication Studies, University of Tennessee Knoxville ⁴ Department of Communication, University of California Santa Barbra ⁵ Department of Communication, University of Maryland

Abstract

Memorable messages about breast cancer sent by different sources, such as friends and family members, were analyzed for the action tendency emotions that they evoked. Negative emotions of fear, sadness, and anger, and positive emotions of hope and relief were analyzed for their associations with prevention and detection breast cancer behaviors. Messages that evoked fear were significantly more likely to be associated with detection behaviors, whereas messages that evoked relief were significantly less likely to be associated with detection behaviors than messages that did not evoke these emotions. These results are consistent with control theory and also show that friends and family are important sources of memorable messages about breast cancer.

Keywords

Memorable Messages; Action Tendency Emotions; Breast Cancer Prevention; Breast Cancer Detection

Cancer is one of the greatest health concerns in the United States. Vast numbers of people are affected by cancer, and breast cancer is one of the most prevalent types. Most American women will have exposure to the disease directly or indirectly throughout their lifetimes (Susan G. Komen for the Cure, 2007). A wide variety of messages are created and disseminated to provide information regarding this disease. These messages can come from medical personnel, family, friends, the internet, or mass media campaigns. They are important because they often contain information regarding breast cancer awareness, detection, prevention, and treatment that women and their loved ones can use to improve health behaviors and possibly save lives (Pribble, et al., 2006).

Awareness, detection, prevention, and treatment messages can only be effective, however, if women are able to recall them. Some messages that people recall are *memorable messages* that are “remembered for extremely long periods of time and which people perceive as a major influence on the course of their lives” (Knapp, Stohl, & Reardon, 1981, p. 27).

Research guided by Control Theory has also been conducted to determine what types of memorable messages are utilized as guides to action (Smith & Ellis, 2001; 2004; Smith, Ellis, & Yoo, 2001).

Another line of research has found that evoking certain discrete emotions can result in increased behavioral intentions and actual behaviors (Lazarus, 1991; Nabi, 2002). The research in this area is still in its formative stages, so it is yet to be determined which emotions consistently result in particular behaviors. Dillard and Nabi (2006), in their discussion of emotions associated specifically with cancer-related messages, reasoned that these messages can evoke a variety of emotions such as fear, sadness, and disgust, and that these emotions do have the potential to affect persuasion. Little is known, however, about how *memorable* messages and emotions interact to impact behaviors. It is reasoned here that if a particular emotion is evoked by a certain type of message, the message may become more memorable and the desired action may be enhanced. Specifically, this research effort asked women to report memorable messages about breast cancer and the emotions these messages evoked, and then determined whether the types and emotions of the messages were associated with prevention or detection behaviors.

Memorable Messages

Memorable messages regarding a variety of topics are ubiquitous. In a study focused on how memorable messages can guide behavior, Smith and Ellis (2001) found that 99% of the sample were able to report messages that they recalled when self-assessing behavior that was unusual in either a positive or a negative way. Smith and Ellis (2001) went on to demonstrate that, not only do memorable messages exist, but that these messages can also act as guides to subsequent behavior if one can recall the message at the time of assessing one's own behavior (Smith & Ellis, 2001). Participant actions were found to be in line with, or in direct contrast to, memorable messages in this study. For instance, a participant recalled the memorable message of "lend a hand" when assessing kind acts (Smith & Ellis, 2001, p.162) while another remembered "live a healthy life" while assessing substance abuse (p. 165). The behavioral impact of memorable messages has also been studied, among other domains, in final conversations about religious faith (Keeley, 2004), aging (Holladay, 2002), gendered socialization (Dallimore, 2003), and newcomer socialization in organizations (Stohl, 1986), among other domains.

Most messages people receive are either not attended to or not processed and then are released without retention. A few, however, are retained in long-term memory. What differentiates these memorable messages from the hundreds of easily forgotten messages people receive each day, is that they are perceived as important units of communication because they potentially have a strong effect on behavior and sense-making processes (Holladay, 2002). Messages perceived as memorable are most often brief and prescribe rules of conduct for solving problems (Knapp et al., 1981).

The mechanism posited by Smith and Ellis (2001) to underlie action produced by virtue of memorable messages is the feedback loop from Control Theory (Carver & Scheier, 1982; 1990; Powers, 1973; Weiner, 1948). According to Control Theory, an actor senses whether a discrepancy exists between the current state and an ideal state. If the discrepancy is sufficiently large, it motivates behavior to reduce the discrepancy. Memorable messages may be recalled when the discrepancy is sufficiently large, and they should provide the rules of conduct for solving the problem.

Previous work on memorable breast cancer messages has found that women who have had personal experience *and* close friends or relatives who had experiences with breast cancer are the most likely to recall memorable messages about breast cancer; they are more likely

to recall them than women who have only had a personal experience with breast cancer, only had a friend or family member experience breast cancer, or had no experience whatsoever (Smith, Atkin, Skubisz, Nazione, & Stohl, 2009). This study also determined that the speech acts of these memorable messages are most likely to be perceived as obtaining facts, getting advice, or provision of hope. These memorable breast cancer messages typically concerned early detection, awareness, treatment and prevention of breast cancer, and the most common sources of these messages were the media, friends, family, and medical professionals, respectively (Smith et al., 2009).

One area yet to be explored is the emotions that these messages evoke and the actions that result from receiving messages that evoke them. What follows is a description of action tendency emotions, how their inclusion in memorable messages about breast cancer is predicted to relate to behavioral outcomes, and the specific objectives of the current research.

Action Tendency Emotions

Emotions are generally defined as internal mental states that result from an evaluation of people, events, or objects (Ortony, Clore, & Collins, 1988). Dillard and Nabi (2006) propose that emotions may work concurrently with cognitions to affect the persuasive impact of a message, but note that emotions can have a direct effect on persuasion due to their related action tendencies. An action tendency refers to the ability of an emotion to promote some type of problem solving activity in those who experience particular emotions (Lazarus, 1991). In Control Theory terms, the action tendency of an emotion would occur because it would highlight the valence and magnitude of the discrepancy between the actual and ideal states. Positive emotions are said to occur because the discrepancy is reduced more quickly than anticipated, and negative emotions occur because there is a longer than expected lag between experiencing and reducing the discrepancy (Carver & Scheier, 1990). Therefore, emotions are generally divided into two separate groups: goal incongruent emotions (negative emotions) and goal congruent emotions (positive emotions) (Lazarus, 1991; Nabi, 2002). Of the negative emotions that have been shown to result in action tendencies, anger, sadness, and fear will be assessed in this study. Among the positive emotions that have been studied to determine their action tendencies, hope and relief will be examined.

Negative Action Tendency Emotions—Overall, research has demonstrated that negative emotions are typically more powerful than positive emotions at inducing behavioral responses (Lazarus, 1991). *Anger* is viewed as the reaction to a demeaning offense against oneself or someone close to the individual (Lazarus, 1991). Anger can elicit problem solving behaviors that are intended to neutralize the existing obstacle (Nabi, 2002). *Sadness* is the reaction one feels when an irrevocable loss has been endured. Although this emotion has been shown to slow cognitive functioning, it has also been shown to increase individual inward evaluation, which can lead to problem solving activity in an attempt to recover the loss (Nabi, 1999). *Fear* is viewed as the result of an individual perceiving that he or she or someone close to him or her is in danger (Nabi, 2002). Although extremely high levels of perceived fear can be debilitating, a moderate amount can motivate problem-solving or problem-avoiding behaviors to prevent the feared event from occurring (Lazarus, 1991). Fear has also been conceptualized in the Extended Parallel Process Model (EPPM) as a precursor to preventative health behaviors if one feels they have efficacy in terms of their ability to engage in the behavior in question. Thus, the EPPM would predict that messages which evoke fear with a sense of efficacy would be associated with prevention behaviors (Witte, 1992).

Positive Action Tendency Emotions—*Hope* is the yearning for the amelioration of a dreaded outcome (Lazarus, 1991). There is some debate about the action tendency associated with feelings of hope as no clear action tendency has been determined but it is thought to be associated with action toward what one desires (Lazarus, 1991). *Relief* is the feeling that occurs when a goal incongruent situation either changes for the better or goes away entirely. Relief generally results in very little action tendency because the situation that required action is no longer a factor (Lazarus, 1991).

These predictions that negative emotions motivate action are in line with the predictions of Control Theory because negative emotions highlight goal incongruence and serve to motivate action, whereas positive emotions signal that goal discrepancy has already been reduced.

Research Objectives

Understanding associations among messages, emotions, and behavioral outcomes (e.g. breast cancer detection and/or prevention behaviors) may guide creation of effective breast cancer messages. Therefore, the emotions resulting from particular types and sources of memorable messages and whether they led people to enact prevention or detection behaviors are of principal interest in this investigation. Specifically, according to the literature on memorable messages, Control Theory, and the action tendency emotions discussed above, the following hypotheses and research questions are offered.

RQ1: What of types of memorable messages are likely to evoke certain discrete emotions?

RQ2: Which sources of memorable messages are likely to evoke certain discrete emotions?

H1: Women with memorable messages about breast cancer that evoke anger should be more likely to report prevention and detection behaviors than those whose messages did not evoke anger.

H2: Women with memorable messages about breast cancer that evoke sadness should be more likely to report prevention and detection behaviors than those whose messages did not evoke sadness.

H3: Women with memorable messages about breast cancer that evoke fear should be more likely to report prevention and detection behaviors than those whose messages did not evoke fear.

H4: Women with memorable messages about breast cancer that evoked negative emotions (anger, sadness or fear) should be more likely to report prevention and detection behaviors than those whose messages evoked positive emotions (hope or relief).

At this point, research exploring the action tendencies of hope and relief is scarce. A reasonable prediction cannot be made with the information available, thus the following research questions are posed:

RQ3: Will women with memorable messages about breast cancer that evoked hope be more likely to report prevention and detection behaviors than those whose messages did not evoke hope?

RQ4: Will women with memorable messages about breast cancer that evoked relief be more likely to report prevention and detection behaviors than those whose messages did not evoke relief?

Method

Participants

This project was carried out as part of the NIEHS/NCI Breast Cancer and the Environment Research Centers, four centers with transdisciplinary research collaboration integrated across biologic, epidemiologic, and community outreach projects. Participants were recruited from breast cancer awareness organizations, advocacy groups, a large Midwestern university, and a medium-sized Western university in the United States. In sum, 359 female respondents completed the survey. Participants ranged from 18 to 85 years old ($M = 45.0$; $SD = 13.6$). Caucasians composed the majority of the sample, 85%. African Americans (4%), Latinos (3%), Asian Americans (2%), Native Americans (2%), Pacific Islanders (3%), and those choosing not to report their ethnicity (1%) composed the remainder of the sample. When participants were asked about their highest level of education, 11% reported a high school degree or less, 35% participants completed some college, technical school, or earned an associates degree, 32% earned a bachelor's degree, and 22% had graduate schooling.

Instrumentation and Procedure

Participants completed a web-based survey questionnaire. The beginning of the survey gave the definition of a memorable message provided previously and asked participants if they could recall a memorable message about breast cancer. If the participant did have a memorable message ($N=207$, 60% of total), a series of open-ended questions asked about personal experience with breast cancer as well as characteristics of and responses to their memorable message.

The topics of memorable messages were coded reliably (Cohen's Kappa = .93) by two trained coders into 16 subcategories that formed four second order categories also determined by the two coders using constant comparative methodology which involves developing and reworking categories as the data are read and coded instead of having categories prepared beforehand (Glaser & Strauss, 1967). In instances where the two coders disagreed, they discussed their reasoning and resolved the disagreement. Categories, subcategories, examples and definitions of memorable messages can be found in Table 1. Previous research (Smith et al., 2009) found that four categories of memorable messages emerged from a frequency analysis of all of the memorable messages reported here: early detection (37.3%), awareness (30.9%), treatment (25.8%), and prevention (6.0%).

Message sources were coded into four main categories (family, friend, media, medical professional) from the 17 categories that participants identified (Cohen's Kappa = 1.0). Categories, subcategories, and definitions of sources can be found in Table 2.

Participants were also asked to describe which, if any, emotions they experienced as a result of the message. Responses included the valence of the emotion experienced as well as the specific discrete emotion experienced. Each open-ended response to this question was coded reliably into six different categories by two coders (Cohen's Kappa = .81). Discrete emotions included *anger*, *sadness*, *fear (with and without a sense of efficacy)*, *relief*, and *hope*. The categories and definitions of emotions can be found in Table 3.

Relationship between Memorable Messages and Behaviors

In order to assess the relationship between memorable messages and behaviors, respondents indicated whether they had engaged in breast cancer detection behaviors and/or breast cancer prevention behaviors. Respondents answered the questions, "*Did you engage in breast self exams as a result of this message?*" and "*Did you engage in mammograms as a result of this message?*" These two questions had a Spearman ρ of .52 ($n = 214$, $p < .05$) and

were summed to form a composite measure of detection behaviors that ranged from zero to two ($M = 1.46$, $SD = 0.78$). Breast self-exams and mammograms are valid measures of detection as they are recognized detection behaviors for breast cancer by the American Cancer Society and the National Cancer Institute (ACS, 2009a; NCI, 2009a). Respondents also answered the questions, “*Did you engage in eating healthy food as a result of this message?*” and “*Did you engage in exercise as a result of this message?*” These two questions had a Spearman ρ of .71 ($n = 210$, $p < .05$). Eating a healthy diet and engaging in exercise are valid measures of prevention as they are recognized prevention behaviors for breast cancer by the American Cancer Society and the National Cancer Institute (ACS, 2009b; NCI, 2009b). Summing responses to these two questions formed a composite measure of prevention behaviors that ranged from zero to two ($M = 1.34$, $SD = 0.87$). Although the data are categorical, this procedure is meaningful: 1) there are two categories in each variable and 2) the categories differ in magnitude rather than quality.

Results

Evoked Emotions

Research Questions One and Two—Research question one asked what *types* of memorable messages are likely to evoke certain discrete emotions and research question two asked which *sources* of memorable messages are likely to evoke certain discrete emotions. See Table 4 for frequencies of all emotions evoked by the memorable messages. These emotions varied as a function of both message category and source. Table 5 provides answers to RQ1 and RQ2. These results highlight the importance of family and friends as sources of memorable messages about breast cancer. A breakdown of emotions evoked by both message source and type is provided in Table 6.

Behavioral Outcomes

Because sample sizes for memorable messages that did not evoke an emotion were substantially larger than sample sizes for memorable messages that did evoke an emotion, a simple random sample from the no emotion group was taken for each hypothesis test so that group sizes would be approximately equal.

Hypothesis One—Hypothesis one predicted that women with memorable messages about breast cancer that evoke anger should be more likely to report prevention and detection behaviors than those whose messages did not evoke anger. The results were not consistent with this hypothesis. Women with memorable messages that evoked anger were not more likely to report prevention behaviors ($M = 1.20$, $SD = 0.92$) than women without memorable messages that evoked anger ($M = 1.78$, $SD = 0.67$). Nevertheless, women without memorable messages evoking anger reported more prevention behaviors than women with memorable messages evoking anger by a nontrivial, albeit statistically insignificant, amount $t(17) = -1.52$, ns , $r = -.35$, $P(-.76 \leq \rho \leq .06) = .95$. Memorable messages evoking anger had no relationship with detection behaviors. The mean detection behavior score in both instances was 1.40; therefore, we do not report statistical tests.

Hypothesis Two—Hypothesis two predicted that women with memorable messages about breast cancer that evoke sadness should be more likely to report prevention and detection behaviors than those whose messages did not evoke sadness. The data were also inconsistent with this hypothesis. Memorable messages evoking sadness were not more likely to be associated with prevention behaviors ($M = 1.23$, $SD = 0.90$) than memorable messages not evoking sadness ($M = 1.39$, $SD = 0.86$), $t(75) = -0.82$, ns , $r = -.09$, $P(-.31 \leq \rho \leq .13) = .95$. Additionally, memorable messages evoking sadness were not more likely to be

associated with detection behaviors ($M = 1.56$, $SD = 0.72$) than memorable messages not evoking sadness ($M = 1.31$, $SD = 0.92$), $t(76) = 1.37$, ns , $r = .16$, $P(-.06 \leq p \leq .38) = .95$.

Hypothesis Three—Hypothesis three predicted that women with memorable messages about breast cancer that evoke fear should be more likely to report prevention and detection behaviors than those whose messages did not evoke fear. The data were partially consistent with this hypothesis. Women recalling memorable messages that evoked fear were not more likely to report prevention behaviors ($M = 1.56$, $SD = 0.72$) than women recalling memorable messages not evoking fear ($M = 1.38$, $SD = 0.81$), $t(77) = 1.10$, ns , $r = .12$, $P(-.10 \leq p \leq .34) = .95$. Women recalling memorable messages that evoked fear were, however, more likely to report detection behaviors ($M = 1.70$, $SD = 0.65$) than women recalling memorable messages not evoking fear ($M = 1.23$, $SD = 0.84$), $t(77) = 2.78$, $p < .05$, $r = .30$, $P(.25 \leq p \leq .35) = .95$.

In terms of the differences between fear with efficacy and fear without efficacy messages, the two variables did not produce statistically significant differences in prevention and detection behaviors ($t(39) = -1.51$, ns for prevention, and $t(38) = -0.79$, ns for detection). However, Messages that evoked fear without efficacy were more likely to be associated with prevention behaviors ($M=.92$) than fear with efficacy messages ($M=.77$) by a non-trivial amount ($r = -.24$, $P(-.53 \leq p \leq .05) = .95$). The same pattern held for detection behaviors, albeit with a weaker effect (fear without efficacy $M=.83$, fear with efficacy $M=.74$, $r = -.13$, $P(-.44 \leq p \leq .18) = .95$).

Hypothesis Four—Hypothesis four predicted that women with memorable messages about breast cancer that evoked a negative emotion (such as anger, sadness or fear) should be more likely to report prevention and detection behaviors than those whose messages evoked a positive emotion (such as hope or relief). The data were not consistent with this hypothesis. Women with memorable messages about breast cancer evoking a negative emotion were not any more likely to report engaging in prevention behaviors ($M = 1.42$, $SD = 0.83$) than women with memorable messages evoking a positive emotion ($M = 1.39$, $SD = 0.86$), $t(64) = -0.15$, ns , $r = -.02$, $P(-.26 \leq p \leq .22) = .95$. The relationship between negative emotions and detection behavior, however, did approach statistical significance. Women with memorable messages evoking negative emotions were slightly more likely to report engaging in detection behaviors ($M = 1.71$, $SD = 0.63$) than women reporting memorable messages that evoked positive emotions ($M = 1.33$, $SD = 0.89$), $t(65) = -1.98$, $.05 < p < .10$, $r = -.24$, $P(-.47 \leq p \leq -.01) = .95$. In sum, a pattern emerged that indicated prevention and detection behavioral outcomes are most likely to occur when a negative emotion is evoked, less likely to occur when a positive emotion is evoked, and the least likely to occur when no emotion is evoked by their memorable messages.

Research Question Three—RQ3 was posed to determine whether women with memorable messages about breast cancer that evoked hope were more likely to report prevention and detection behaviors than those whose messages did not evoke hope. Memorable messages evoking hope were not more likely to be associated with prevention behaviors ($M = 1.44$, $SD = 0.85$) than memorable messages not evoking hope ($M = 1.54$, $SD = 0.71$), $t(51) = -0.44$, ns , $r = -.06$, $P(-.33 \leq p \leq .21) = .95$. Additionally, memorable messages evoking hope were not more likely to be associated with detection behaviors ($M = 1.41$, $SD = 0.84$) than memorable messages not evoking hope ($M = 1.56$, $SD = 0.75$), $t(52) = -0.68$, ns , $r = -.09$, $P(-.36 \leq p \leq .18) = .95$.

Research Question Four—RQ4 was posed to determine outcomes of women recalling memorable messages about breast cancer that evoked relief. Women recalling memorable messages evoking relief were not any more likely to report prevention behaviors ($M = 1.17$,

$SD = 0.98$) than women recalling memorable messages not evoking relief ($M = 1.67$, $SD = 0.52$), $t(10) = -1.10$, ns , $r = -.33$, $P(-.86 \leq \rho \leq .20) = .95$. Women recalling memorable messages that evoked relief were, however, less likely to report that they engaged in detection behaviors ($M = 1.00$, $SD = 1.10$) than women recalling memorable messages not evoking relief ($M = 2.00$, $SD = 0.00$), $t(10) = -2.24$, $p < .05$, $r = -.58$, $P(-.97 \leq \rho \leq -.19) = .95$.

Discussion

Formal tests, such as these, that examine the behaviors that are the result of certain emotions are rare in the action tendency emotion literature. The results of this study add to the general knowledge of emotions, specifically for the five most commonly-reported emotions in this sample: sadness, hope, fear with and without a sense of efficacy, and relief.

Anger is typically associated with problem solving actions (Lazarus, 1991; Nabi, 1999). For this reason, it is interesting that women in this sample who recalled a memorable message that evoked anger were not more likely to engage in either prevention or detection behaviors as a result of the message than women who did not. One explanation for this lack of a significant difference is that anger was infrequently evoked by a memorable message about breast cancer, as it accounted for only 4.5% of all emotions. Another explanation could be that anger is an emotion that often leads to thoughts about the source of the message, rather than the cause of the message which in this case is cancer. In an experiment performed by Smith and Dillard (2001), when anger was induced in a participant, their thoughts were more likely to be off-topic and emotion-centered than those who had a different negative emotion induced. Thus, the women in this study who reported experiencing anger may not have focused their thoughts on the topic of breast cancer; they may have instead sought to resolve their anger in a way unrelated to prevention or detection behaviors, perhaps through other anger-appaising strategies such as derogation of the source.

What has been studied thus far about *sadness* has indicated that this emotion rarely results in initial motivation to act (Lazarus, 1991; Nabi, 1999). In fact, it is often the case that sadness results in a cognitive slow-down and only after internal reflection does one experience motivation to reduce sadness. Even in this context, where respondents had a long time to think about the memorable messages, sadness did not result in significant prevention or detection behavioral outcomes. This lack of an association could be explained by Ellsworth and Smith's (1988) explanation of sadness, which says that it results in a desire to shut out the situation which caused the sadness. If that is the case, the women who experienced it as a result of a memorable message may have chosen to not think about breast cancer at all, in an attempt to avoid feeling further sadness.

The emotion of *fear* is probably the action tendency emotion that has garnered the most research attention. It is often the case that fear, at moderate levels, can result in problem solving behaviors. This was not the case for prevention behaviors, as women who recalled a memorable message that evoked fear were equally likely as women who recalled a memorable message that did not evoke fear to engage in preventative behaviors as a result of the message. However, fear evoking messages were more likely to be associated with detection behaviors. One interesting finding of the present study is that when messages evoked fear with or without efficacy, the means for prevention and detection behaviors were in the opposite direction predicted by the EPPM: fear without efficacy was most likely to be associated with prevention behaviors, although the relationship was not statistically significant. These findings, again, could be due to the small sample size, which means they need to be replicated before any firm conclusions can be drawn.

As previously mentioned, the action tendencies of the emotion of hope are open to some debate. Hope is conceptualized as the yearning for the amelioration of a dreaded outcome (Lazarus, 1991). The fact that hope was most likely to be associated with treatment messages (23.2%) may indicate that those who feel hopeful are those who currently have, or previously had, experience with breast cancer. This may be due to the fact that hope is acting more as coping mechanism or a personal attempt to stay positive, which could also explain why women who experienced hope were not more likely to engage in prevention or detection behaviors. The reasoning for this is unclear, but it could be related to Lazarus and Folkman's (1984) suggestion that hope may influence problem-solving coping activities (such as engaging in breast cancer prevention or detection behaviors) when the person believes they have control over the situation. If they perceive that they have little or no control, then it may have a weak influence. That may be the case in this situation; the women who reported messages that evoked hope may have felt that they could not control whether or not they got breast cancer, so they did not tend to engage in problem-solving activities.

Relief is conceptualized as the feeling that occurs when a goal-incongruent situation either changes for the better or goes away entirely. Previous research has found very few action tendencies associated with relief because the situation that required action is no longer a factor (Lazarus, 1991). In Control Theory terms, the discrepancy between the actual and the ideal has already been reduced, thus limiting the motivational drive to perform healthy behaviors. Respondents here were less likely to engage in detection behaviors if they recalled a memorable message that evoked relief compared to women who had a memorable message that did not evoke an emotion. This is consistent with the lack of associated action tendencies for relief.

Past research has typically found negative emotions to be associated with more powerful action tendencies than positive emotions (Lazarus, 1991). This was not the case in this study. Women with memorable messages about breast cancer evoking a negative emotion were not any more likely to report engaging in prevention behaviors than women with memorable messages evoking a positive emotion. However, women with memorable messages evoking negative emotions were slightly more likely to engage in detection behaviors than women reporting memorable messages that evoked positive emotions. When the analyses include the actions taken by those who did not have positive or negative emotions evoked by the message, the results show that there is a pattern, although it is not statistically significant, for actions to occur most when a negative emotion is evoked, less so when a positive emotion is evoked, and the least when no emotion is evoked. Positive emotions had a more pronounced effect on prevention behaviors and negative emotions had a stronger effect on detection behaviors.

The power of interpersonal sources of memorable messages that evoke emotions is also highlighted in this study. Family members and friends were often reported as the sources of memorable messages about breast cancer that evoked sadness, fear, and hope.

These findings have numerous implications for breast cancer message construction and dissemination. As this is a preliminary investigation into action tendency emotions about breast cancer memorable messages, it is a first step in the process to determine firm conclusions about which type of emotions will motivate positive prevention and detection behaviors in women. Friends and family members of these women can subsequently be trained in message production so that their messages have the maximum positive impact on their loved ones' lives. Media channels such as the internet and the television could be used for such training. Furthermore, doctors could send these messages to their patients during visits and urge their patients to share the message with their friends and family. These

methods seek to create the most impact as they provide information to individuals through a given source and then encourage listeners to further disseminate messages by making them aware of the power their words have for loved ones. This study would suggest that such training should enlist the spread of messages which evoke fear, but because this finding conflicts with past research, further studies should be completed before such steps are taken. Additionally, this research lends itself to audience segmentation efforts to construct tailored messages. Emotions and behaviors evoked differed by message type as well as source. This work not only has applications for prevention and detection messages but also for creating awareness and treatment messages. Hence, emotion is evoked at all stages of the breast cancer experience and health communicators have a calling to assist at each of these levels.

Limitations & Future Directions

The limitations of the study include the fact that, the sample size of participants experiencing emotions from their memorable messages was relatively small which may have accounted for the reason why multiple findings approached significance rather than surpassing the .05 threshold. Additionally, the majority of participants were Caucasian which may limit the generalizability of this study's findings. The survey may have also had an order effect on participants by asking all participants to report on their memorable message prior to reporting their detection and prevention behaviors, although this was necessary as respondents were asked to report on behaviors as a result of the messages. Additionally, detection and prevention behaviors were measured using two questions each.

Future studies should seek to remedy these limitations in order to determine whether consistent results are found. Additionally, more research should be conducted regarding emotions. This is particularly true if evoking positive emotions such as hope and relief is essentially an impediment to positive actions in prevention, detection, and treatment of breast cancer. In general, to echo Dillard and Nabi's (2006) call for research, it would be extremely beneficial to further consider how emotions evoked in messages operate to directly influence the audiences' attitudes and behavioral intentions for breast cancer prevention and detection behaviors. It would also be valuable for future research to pursue understanding the nature of the memorable message → emotion → behavior process, to better explain the interaction between emotions and committing messages to memory.

Conclusion

These findings demonstrate promise for the strategic use of message type, source, and evoked action tendency emotions in breast cancer interventions. They highlight the power of messages sent by interpersonal relations such as friends and family. This is especially the case in terms of using fear as a persuasive emotion as, of the five emotions examined here, it was most likely to lead to a behavioral action tendency. In addition, although hope was not associated with an action tendency, it was a frequently evoked emotion. Given that this emotion is understudied and prevalent in breast cancer messages, further examination is warranted. Overall, this research could help interpersonal sources as well as health campaign designers to create and use effective breast cancer detection and prevention messages to encourage breast cancer prevention and detection behaviors in their loved ones.

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References

- American Cancer Society. Can breast cancer be found early?. 2009a. Retrieved June 2, 2009 from http://www.cancer.org/docroot/CRI/content/CRI_2_4_3X_Can_breast_cancer_be_found_early_5.asp?sitearea=
- American Cancer Society. Can breast cancer be prevented?. 2009b. Retrieved June 2, 2009 from http://www.cancer.org/docroot/CRI/content/CRI_2_4_2X_Can_breast_cancer_be_prevented_5.asp?sitearea=
- Carver CS, Scheier MF. Control Theory: A useful conceptual framework for personality-social, clinical, and health psychology. *Psychological Bulletin*. 1982; 92:111–135. [PubMed: 7134324]
- Carver CS, Scheier MF. Origins and functions of positive and negative affect: A control-process view. *Psychological Review*. 1990; 97:19–35.
- Dallimore EJ. Memorable messages as discursive formations: The gendered socialization of new university faculty. *Women's Studies in Communication*. 2003; 26:214–265.
- Dillard JP, Nabi RL. The persuasive influence of emotion in cancer prevention and detection messages. *Journal of Communication*. 2006; 56:S123–S139.
- Ellsworth PC, Smith CA. From appraisal to emotion: Differences among unpleasant feelings. *Motivation and Emotion*. 1988; 12:271–302.
- Holladay SJ. “Have fun while you can,” “You’re only as old as you feel,” and “Don’t ever get old!” An examination of memorable messages about aging. *Journal of Communication*. 2002; 52:681–697.
- Keeley M. Final conversations: Survivors’ memorable messages concerning religious faith and spirituality. *Health Communication*. 2004; 16:87–104. [PubMed: 14979853]
- Knapp ML, Stohl C, Reardon KK. “Memorable” messages. *Journal of Communication*. 1981; 31:27–41.
- Lazarus, RS. *Emotion and adaptation*. New York, NY: Oxford University Press; 1991.
- Lazarus, RS.; Folkman, S. *Stress, appraisal, and coping*. New York: Springer Publishing Company; 1984.
- Mitchell M, Brown K, Morris-Villagran M, Villagran P. The effects of anger, sadness and happiness on persuasive message processing: A test of the Negative State Relief Model. *Communication Monographs*. 2001; 68:347–359.
- Nabi RL. A cognitive-functional model for the effects of discrete negative emotions on information processing, attitude change, and recall. *Communication Theory*. 1999; 93:292–320.
- Nabi, RL. Discrete emotions and persuasion. In: Dillard, JP.; Pfau, M., editors. *The persuasion handbook: Developments in theory and practice*. Thousand Oaks: Sage Publications; 2002. p. 99–116.
- National Cancer Institute. What you need to know about breast cancer. Screening. 2009a. Retrieved June 2, 2009 from <http://www.cancer.gov/cancertopics/wyntk/breast/page5>
- National Cancer Institute. Breast cancer prevention. 2009b. Retrieved June 2, 2009 from <http://www.cancer.gov/cancertopics/pdq/prevention/breast/Patient/page3>
- Ortony, C.; Clore, GL.; Collins, A. *The cognitive structure of emotions*. New York: Cambridge University Press; 1988.
- Powers, WT. *Behavior: The control of perception*. Chicago: Aldine; 1973.
- Pribble JM, Goldstien KM, Fowler EF, Greenberg MJ, Noel SK, Howell JD. Medical news for the public to use? What’s on local TV news? *American Journal of Managed Care*. 2006; 12:170–176. [PubMed: 16524349]
- Smith SW, Atkin C, Skubisz CM, Nazione S, Stohl C. The impact of personal and/or close relationship experience on memorable messages about breast cancer and the perceived speech acts of the sender. *Journal of Cancer Education*. 2009; 24:129–134. [PubMed: 19431030]
- Smith SW, Ellis JB. Memorable messages as guides to self-assessment of behavior: An initial investigation. *Communication Monographs*. 2001; 68:154–168.
- Smith SW, Ellis JB. Memorable messages as guides to self-assessment of behavior: A replication and extension diary study. *Communication Monographs*. 2004; 71:97–119.

- Smith SW, Ellis JB, Yoo J. Memorable messages as guides to self-assessment of behavior: The role of instrumental values. *Communication Monographs*. 2001; 68:325–339.
- Smith SW, Nazione S, LaPlante C, Kotowski MR, Atkin C, Skubisz CM, Stohl C. Topics and sources of memorable breast cancer messages and their impact on prevention and detection behaviors. *Journal of Health Communication*. 2009; 14:293–307. [PubMed: 19440911]
- Stohl C. The role of memorable messages in the process of organizational socialization. *Communication Quarterly*. 1986; 34:231–249.
- Susan, G. Komen for the Cure. 2007. Retrieved September 27, 2007 from <http://www.komen.org/stellent/groups/public/>
- Weiner, N. *Cybernetics: Control and communication in the animal and the machine*. Cambridge: MIT Press; 1948.
- Witte K. Putting the fear back in fear appeals: The Extended Parallel Process Model. *Communication Monographs*. 1992; 61:113–134.

Table 1

Categories and subcategories of memorable breast cancer messages

Categories	Definitions	Examples
Awareness	Messages which raised individuals' knowledge regarding breast cancer	
<i>Statistics/Facts</i>		"Over 40,000 women a year die from breast cancer"
<i>Breast Cancer Prevalence</i>		"Breast cancer affects everyone"
<i>Campaigns/Organizations</i>		"The pink ribbon"
Prevention	Messages which dealt with how individuals could discover they had breast cancer	
<i>Health/Be Proactive</i>		"You have to take care of your body and health because no one else will do it for you."
<i>Improve/Change Health</i>		"Sheryl Crow was on the Ellen show recently and talked about the importance of eating organic foods, or avoiding pesticides, etc. and being careful with what water we drink, including the fact that tap water is sometimes better than some bottled waters."
<i>Family Risk</i>		"On a talk show I saw a family of women who had preventative full mastectomies because of the genetic risk level"
Detection	Messages which dealt with how individuals could reduce their risk of getting breast cancer	
<i>Breast Self Exams</i>		"Do a breast self exam every month"
<i>Mammograms</i>		"Don't put off having a mammogram"
<i>Breast Self Exams and Mammograms</i>		"Don't forget to do self breast exams and get yearly mammograms!"
<i>Early Detection</i>		"Early detection saves lives"
Treatment	Messages which dealt with how individuals could care for or live with breast cancer	
<i>Appearance</i>		"I would rather have lost a breast than my life, I am lucky I caught it early enough to not have it take the rest of me...if it comes down to the choice, it's just cosmetics."
<i>Choices</i>		"If I do not have the mass taken care of now, I may not be able to enjoy my grandchildren"
<i>Survival Choices</i>		"breast cancer has made me realize that parts or components of our bodies once removed, allows for the continuous spirit to prevail."
<i>Social Support</i>		"I promise that one morning you will wake up and cancer will not be the first thing you think of."
<i>Womanhood</i>		"I will not loose what makes me a woman"
<i>Fear/Pain/Negative</i>		"When a premenopausal woman walks into the oncology clinic, we think of her as a dead woman."
<i>Appreciation for Everyday Life</i>		"I previously worked for the American Cancer Society, and I met women with breast cancer. They didn't go into detail about the complications, but they said it changed their life, and that everything you do should be worth doing. It seemed like they valued life more than before they had breast cancer."

* Examples have been taken straight from respondent answers and may include grammatical errors.

Table 2

Sources of memorable breast cancer messages

Category	Definition
Friends	Friends
<i>Friends</i>	
Family	An immediate or extended family member
<i>Mother</i>	
<i>Father</i>	
<i>Grandmother</i>	
<i>Grandfather</i>	
<i>Husband</i>	
<i>Cousin</i>	
<i>Aunt</i>	
<i>Child</i>	
Medical Professional	An individual in the medical field
<i>Doctor</i>	
<i>Nurse</i>	
Media	Information from a widely broadcast channel
<i>Celebrity</i>	
<i>Journalist</i>	
<i>Other Media Source</i>	
Other	An other source
<i>Teacher</i>	
<i>Authority Figure</i>	
<i>Other Source</i>	

Table 3

Discrete Emotions Elicited by Memorable Messages

Emotion	Definition
Anger	Something offensive (Lazarus, 1991)
Fear	Sensing danger (Nabi, 2002)
<i>With Efficacy</i>	Sensing danger and believing it can be averted easily (Witte, 1992)
<i>Without Efficacy</i>	Sensing danger and not believing it can be averted easily (Witte, 1992)
Sadness	Enduring a irrevocable loss (Lazarus, 1991)
Relief	The end of a bad situation (Lazarus, 1991)
Hope	Yearning for good outcomes (Lazarus, 1991)

Table 4

Emotions Evoked by Memorable Messages

Emotion	Percent of Total
Sad	17.9%
Fear	17.9%
With efficacy	7.6%
Without efficacy	10.3%
Hope	12.6%
Relief	2.7%
Anger	4.5% *

* Totals do not add to 100% because not all messages evoked one of these emotions.

Table 5

Emotions Evoked by Memorable Messages and Source

Message Type and Source	Sad	Fear	Fear With Efficacy	Fear Without Efficacy	Hope	Relief	Anger
Message Type							
<i>Awareness</i>	11.9%	20.9%	6.0%	14.9%	13.4%	3.0%	1.5%
<i>Prevention</i>	23.1%	23.1%	15.4%	7.7%	15.4%	0.0%	7.7%
<i>Detection</i>	22.2%	19.8%	7.4%	12.3%	3.7%	1.2%	6.2%
<i>Treatment</i>	17.9%	10.7%	8.9%	1.8%	23.2%	5.4%	5.4%
Source							
<i>Friend</i>	30.6%	22.4%	10.2%	12.2%	14.3%	2.0%	0.0%
<i>Family</i>	28.3%	15.2%	6.5%	8.7%	13.0%	0.0%	13.0%
<i>Media</i>	11.7%	11.7%	3.9%	7.8%	13.0%	2.6%	2.6%
<i>Medical</i>	6.1%	24.2%	12.1%	12.1%	9.1%	9.1%	6.1%
<i>Total Interpersonal</i>	58.9%	37.6%	16.7%	27.3%	27.3%	2.0%	13.0%

* Totals do not add to 100% as not all messages were associated with one of these emotions, message types or sources.

Table 6

Emotions Evoked by Both Memorable Message Type and Source

Message Type by Source	Sad	Fear	Fear with Efficacy	Fear Without Efficacy	Hope	Relief	Anger
<i>Awareness</i>							
<i>Family</i>	0.0%	7.1%	0.0%	10.0%	11.1%	0.0%	0.0%
<i>Media</i>	22.2%	50.0%	50.0%	50.0%	33.3%	0.0%	100%
<i>Medical</i>	50.0%	0.0%	0.0%	0.0%	0.0%	100%	0.0%
<i>Friend</i>	28.6%	28.6%	25.0%	30.0%	44.4%	0.0%	0.0%
<i>Prevention</i>							
<i>Family</i>	100%	33.3%	50.0%	0.0%	0.0%	0.0%	100%
<i>Media</i>	0.0%	0.0%	0.0%	0.0%	100%	0.0%	0.0%
<i>Medical</i>	0.0%	33.3%	50.0%	0.0%	0.0%	0.0%	0.0%
<i>Friend</i>	0.0%	33.3%	0.0%	100%	0.0%	0.0%	0.0%
<i>Detection</i>							
<i>Family</i>	38.9%	33.3%	33.3%	33.3%	33.3%	0.0%	60.0%
<i>Media</i>	27.8%	13.3%	16.7%	11.1%	0.0%	66.7%	0.0%
<i>Medical</i>	0.0%	40.0%	50.0%	33.3%	33.3%	0.0%	40.0%
<i>Friend</i>	33.3%	13.3%	0.0%	22.2%	33.3%	33.3%	0.0%
<i>Treatment</i>							
<i>Family</i>	30.0%	0.0%	0.0%	0.0%	30.8%	0.0%	66.7%
<i>Media</i>	20.0%	0.0%	0.0%	0.0%	30.8%	66.7%	33.3%
<i>Medical</i>	10.0%	16.7%	0.0%	100%	15.4%	0.0%	0.0%
<i>Friend</i>	40.0%	66.7%	80.0%	0.0%	15.4%	33.3%	0.0%

* Not all totals add to 100% as not all messages were associated with one of these emotions, message types or sources.