International Journal of Communication 8 (2014), 2629–2649 1932–8036/20140005

Communicating Health Problems Online: An Investigation of Frame Selection and the Cognitive Effects of Health Disclosures

WEIRUI WANG
Florida International University, USA

An experiment was conducted to understand how people disclose their health experiences online and the effects of frame selection on behavioral intentions. Participants were asked to respond to a narrative or an informational message in an online discussion of a common health issue. Four original generic frames—the reconstruction, suffering, advice/support, and denial/reactance frames—were used to analyze health disclosures and the subsequent effects. The results revealed that narrative messages encouraged participants to use the advice/support frame more frequently. Those who used the advice/support frame tended to be more frequently involved in the transformation mode and reported greater intentions of engaging in the behavior that might alleviate the health problem. Theoretical and practical implications are discussed.

Keywords: narrative messages, health disclosures, frames, health behaviors

The prevalence of social media provides people with an opportunity to exchange health experiences and information as never before. Challenging the top-down fashion of information flow, these health experiences and concerns shared by social media users provide diverse types of support to many people in coping with their health problems. Although there are debates about outcomes of disclosing private health experiences on social media (Bisceglio, 2013), the disclosure's therapeutic effect is well recognized in illness prevention and treatment (Gray, 2009). Empirical evidence has demonstrated that disclosure of a traumatic event or a disturbing life experience can bring many health benefits, ranging from physical health to psychological well-being (Graybeal, Sexton, & Pennebaker, 2002; Shaw, Hawkins, McTavish, Pingree, & Gustafson, 2006; Shim, Cappella, & Han, 2011; Smyth, 1998).

To understand why health disclosures can lead to the benefits mentioned above, various approaches across academic disciplines have been used to analyze diverse attributes of health narratives (Angus, Lewin, Bouffard, & Rotondi-Trevisan, 2004; Shim et al., 2011). Three frequently used approaches—the insightful and emotional disclosures approach, the narrative processes model, and the framing theory—are examined in the current study to understand the construction of health narratives and

Weirui Wang: weirwang@fiu.edu
Date submitted: 2013–07–02

their impact. While the first and second approaches have been recognized as explaining what narrative features lead to emotional and cognitive changes and why (Angus et al., 2004; Shim et al., 2011), the explanatory and predictive value of the third approach—framing theory—has been debated. Framing analysis often uses a vast number of issue-specific frames (Hertog & McLeod, 2001). The findings obtained by using these frames, however, are difficult to replicate and limit our understanding about how people construct illness narratives. The inconsistent frames used in different studies also make it harder to determine where communication research and research in other disciplines agree and differ in understanding such narratives (Hertog & McLeod, 2001).

The current study was exploratory and examined how people construct their health narratives online. Its primary purpose was to develop four original generic frames to overcome the inconsistency issue reported in previous framing analyses. These frames were assessed in relation to the narrative features previously studied using the insightful/emotional disclosures approach and the narrative processes model to determine their validity. The second purpose was to test the applicability of these frames. Through an experiment, this study examined which generic frames participants used to respond to narrative and informational messages in health-related social media and the effects that frame selection had on behavioral intentions.

The article starts with a literature review, which is organized based on the study's purposes. The theoretical framework behind a frame typology is addressed first. Other approaches to studying health narratives and their relationships with the frames are then reviewed. Next, the applicability of these frames is discussed with message format as a predictor and health behavioral intentions as an outcome. The article continues with the methodology section, presenting the details of the experiment and reporting the results. Finally, findings are discussed, and implications drawn.

Literature Review

Disclosure is a process in which an individual reveals his or her experiences, feelings, and thoughts. Compared with individuals who write about an innocuous topic, researchers have found that expressive disclosures can reduce the negative outcomes associated with emotional inhibition and can enhance physical health, psychological well-being, physiological functioning, and general functioning (Smyth, 1998). In addition to emotional disclosures, insightful disclosures have been found to increase health efficacy (Shim et al., 2011). While health-related disclosures generally seem to lead to positive outcomes, other studies report inconsistent or contrary findings. For example, research has been unable to conclude whether disclosures can influence people's health behaviors (Smyth, 1998). The inconsistent effects of insightful disclosures on health concerns have also been debated (Creswell et al., 2007; Shaw et al., 2006; Shim et al., 2011). Thus, many approaches have been employed to study the structure of health narratives as a way to improve our understanding of their effects on health outcomes.

Framing Theory

According to framing theory, people make sense of their experiences using interpretational packages called frames (Gamson & Modigliani, 1989). Entman (1993) notes that *to frame* is to "promote a

particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation" (p. 52). In other words, by using different frames to construct health experiences, different causes and solutions are promoted.

Research has long found the dichotomy between self-identity vs. nonself-identity (see, for example, Bury, 2001; Charmaz, 1983; Mathieson & Stam, 1995) and approach vs. avoidance coping styles (see, for example, Elliot, 1999; Roth & Cohen, 1986) as two issues useful in explaining the variation in illness narratives and their impact on health outcomes. With regard to the self- vs. nonself-identity, many scholars emphasize that whether people accept illness as part of their identity or deny it makes a dramatic difference in how they view their health problems (Bury, 2001; Charmaz, 1983; Mathieson & Stam, 1995). This particular dimension has been used as a common theme in earlier literature to develop different typologies of illness narratives (Bury, 2001). Similarly, approach and avoidance coping styles have been predominantly used to understand individuals' strategies for dealing with life-changing events (Roth & Cohen, 1986). These coping styles are strong predictors of the behaviors that people choose to minimize a potential problem and thus influence health outcomes (Roth & Cohen, 1986). This study generates a typology of frames using these two widely accepted dimensions in the illness narratives literature.

***Self- vs. nonself-identity*.** Many studies on illness narratives underscore that the illness experience may alter one's sense of self (Charmaz, 1983; Mathieson & Stam, 1995). For example, Charmaz (1983) argues that people diagnosed with a chronic illness often suffer from the problem of diminished self-concept. Given that individual responsibility is valued culturally, patients who live a restricted life feel devalued and fear becoming a burden on others. This change in self-concept may occur as early as the first diagnosis of a chronic illness. While many patients have difficulty accepting this new identity, whether individuals integrate it into their self-identity influences how they deal with their health issues. As Mathieson and Stam (1995) point out, patients must renegotiate their identity, as it determines the options available to them for resuming their lives.

Whether or not patients recognize illness as part of their self-identity leads to different types of illness narratives. Bury (2001), for instance, conceptualizes three types of illness narratives: contingent, moral, and core. He argues that, among them, the core narratives that focus on the change in self-identity as a way to cope with the illness are the deepest in disclosure. One explanation might be that recognizing the illness as part of one's self-identity increases personal involvement in the health issue, facilitating emotional and cognitive coping. Therefore, individuals who accept this new identity may be more willing to describe their experiences and subjective feelings as well as their thoughts about the health issue if they are asked to talk about it.

***Approach vs. avoidance*.** According to Elliot (1999), approach and avoidance coping styles derive from the motivation to achieve success and avoid failure, respectively. When people choose the approach coping style, they are usually alert to environmental cues and are often involved in an active search for knowledge and techniques for solving problems. They consider problem solving a personal responsibility and carefully plan their problem strategies. On the other hand, when people choose an avoidance coping strategy, they often fail to assess the external threat and are more likely to

procrastinate. They are also more likely to avoid thinking about the negative event and its consequences, and give up their personal responsibility for solving the problem (Roth & Cohen, 1986). These two coping styles were either conceptualized as dispositional tendencies or situational practices in the earlier literature (Roth & Cohen, 1986). While some scholars argue that individuals consistently choose one style over another due to personal traits, others maintain that people may choose one or the other depending on the situation, and the two styles are not mutually exclusive (Roth & Cohen, 1986).

Empirical evidence suggests that the effectiveness of the two coping strategies varies as a function of the controllability of the problematic situation. In general, if the situation is controllable, the approach coping style allows people to take actions to control the threat, which leads to better outcomes. However, if the situation is uncontrollable, the avoidance coping style reduces the stress and may lead to better results (Roth & Cohen, 1986). In health care contexts, using the approach coping strategy has been found to facilitate positive adjustments and negatively correlate with cognitive apathy (Finset & Andersson, 2000; Stanton, Danoff-Burg, & Huggins, 2002). In cases such as diabetes in which effective treatment exists, the approach coping strategy that encourages people to seek an early diagnosis and effective treatment is more advantageous than the avoidance coping strategy. However, in cases such as paralysis, the approach strategy demonstrates no such benefit (Roth & Cohen, 1986), while the avoidance strategy becomes effective to manage the stress of illness onset (Sullivan, Mikail, & Weinshenker, 1997). The approach vs. avoidance dimension is therefore useful for understanding illness narratives because the selection of one strategy may reflect one's subjective evaluation of the health issue and may determine the options available for coping with the issue.

Illness narrative frames. When the two dimensions mentioned above—self- vs. nonself-identity and approach vs. avoidance continuums—are considered simultaneously, a typology of frames is generated that results in four generic frames people can use to construct their health-related narratives (see Figure 1). People who view a health problem as part of their self-identity and want to take an active approach to dealing with it use a *reconstruction frame* in their personal narratives. To use a reconstruction frame, they must identify with the health problem. Furthermore, they must solve the problem by searching for all available solutions. By using this frame, they indicate their belief that the problem can be controlled or eliminated.

On the other hand, if people consider the health problem part of their identity but take an avoidance approach, they may not seek a solution such as changing their attitudes or behaviors to deal with the problem. In other words, they admit the existence of the health problem but internalize it as a bitter part of life. They may unconsciously consider the problem uncontrollable and avoid thinking about the negative consequences associated with the health problem. In this situation, they use a *suffering frame*.

In contrast, people who consider the health problem as not part of their self-identity may take a completely different view. This situation refers to people who have already been affected by the illness but deny it and to people who have not been affected by the health problem but may be at risk for it. Regardless of whether they take an approach or avoidance perspective in dealing with the problem, they are more likely to describe the health problem in a general voice rather than a personal voice,

demonstrating their detachment from the issue. In other words, they do not describe their own experiences with the health problem. If people take an approach perspective, they may think of many strategies to manage the problem from a prevention perspective or from a perspective that helps others suffering from the illness. Given that they do not consider the strategies for coping with the health problem personally relevant, these disclosures use an *advice/support frame.*

Finally, if people adopt an avoidance perspective and do not see the problem as part of their self-identity, they become annoyed by the suggestion that the problem may apply to them. Therefore, in a defensive move, they are likely to express their strong resistance to the idea that the health problem may be relevant to them. They may also downplay information they receive in daily interactions or group discussions that suggests this idea (Witte & Allen, 2000). In this situation, they use a *denial/reactance frame* to construct their personal narratives.

The first goal of this study is to examine which frames people use when discussing a health issue online. Thus, the following research question is proposed:

RQ_1: What frame do people use to discuss a common health problem online?

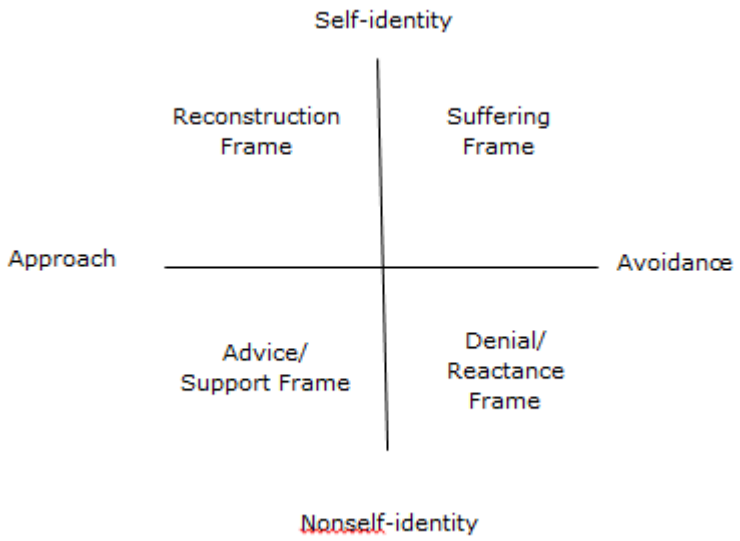

Figure 1. Typology of frames to construct health-related narratives.

Framing and Other Approaches to Health Narratives

Narrative mode. In addition to framing, other approaches have been used to study the structural, organizational, and semantic elements of illness narratives. Some scholars have analyzed the narrative modes and their relationships with therapeutic outcomes. This approach, called the narrative processes model, is often applied in psychotherapy sessions in which therapists help clients construct their disclosures and find new meaning for their traumatic experiences (Angus et al., 2004). The narrative processes model claims that disclosures usually contain three modes: articulation, elaboration, and transformation (Angus & Hardtke, 1994; Angus et al., 2004). The articulation mode refers to the effort of revisiting the traumatic event and reiterating the experience. Categorized as the external narrative sequence in the model, articulation is fundamental to the success of therapy sessions. It helps the clients restore their unconsciously forgotten memories associated with the trauma (Angus et al., 2004). The elaboration mode refers to the narrative process of revealing one's innermost emotions associated with the disturbing event. Unlike articulation, which is recalling the experience as a fact, elaboration of one's subjective feelings is considered the internal narrative sequence in the model (Angus et al., 2004). Finally, the transformation mode refers to the narrative process of constructing new meaning for the disturbing event. This mode is recognized as the reflexive narrative sequence in the model through which people analyze their experiences and emotions. It focuses on cognitive changes after disclosing facts and emotions. Given that psychotherapy's goal is to help clients "re-live the event" and "form new understandings about the self and others," the transformation mode is essential to the success of psychotherapy (Angus et al., 2004, p. 89).

To assess the validity of the generic frames described previously, this study posits several relationships among these frames and the narrative modes. First, as Charmaz (2002) argues, not everyone who has suffered from a traumatic event or chronic illness can articulate their experiences. The disparity between the lived experiences and their subjective accounts explains the difference between story and silence. Many factors contribute to the silence, and denial of illness as self-identity is one of them (Charmaz, 2002). Therefore, this study posits that people who use the frames that consider the health problem part of their self-identity—namely, the reconstruction and suffering frames—use the articulation and elaboration modes more frequently. These individuals accept the illness as part of their self-identity. As a result, they are more likely to be involved in certain narrative modes to describe their health experiences and express their feelings (Angus et al., 2004). In addition, this study hypothesizes that when people use the frames with an approach perspective, namely, the reconstruction and advice/support frames, they use the transformation mode more frequently in their written disclosures. As the adoption of the approach style means people are more alert to finding solutions to a problem (Roth & Cohen, 1986), the individuals who use the approach frame are more likely to be involved in the narrative mode in the search for meaning and solutions (Angus et al., 2004). As such, the following hypotheses are proposed:

H1: The disclosures using the self-identity frames will contain more frequent use of the articulation mode than the disclosures using the nonself-identity frames.

H2: The disclosures using the self-identity frames will contain more frequent use of the elaboration mode than the disclosures using the nonself-identity frames.

H3: The disclosures using the approach frames will contain more frequent use of the transformation mode than the disclosures using the avoidance frames.

Emotional and insightful disclosures. Another frequently used approach to studying health narratives is emotional and insightful disclosures. Scholars believe that disclosure of one's negative experience leads to a variety of benefits such as reduced negative feelings and increased psychological health (Graybeal et al., 2002; Smyth, 1998). They argue that negative feelings may increase momentarily right after disclosures because people are activating these feelings in their disclosures. However, these negative emotions eventually decrease while inhibitions are released. Overcoming the barriers to sharing one's feelings enhances psychological health in the long run (Sloan & Marx, 2004). To examine emotional disclosures, scholars analyze the frequency of emotion words used in personal narratives, including both positive and negative emotion words (Shim et al., 2011).

In addition to emotional changes, positive cognitive changes may also occur as a result of disclosure. The disclosure behavior itself may make people more health conscious (Pennebaker & Seagal, 1999). Cognitive words used in the disclosures reflect the cognitive process people go through when they have another opportunity to re-comprehend and re-frame their experiences (Pennebaker & Beall, 1986). For example, Shim and colleagues (2011) report that insightful disclosures can reduce concerns about breast cancer and increase health efficacy among breast cancer patients. Insightful disclosures are examined by analyzing the cognitive words used in the narratives (Shim et al., 2011).

As argued before, this study hypothesizes that frames that consider the health issue part of one's self-identity, namely, the reconstruction and suffering frames, will contain more emotional expression as a result of identification. Given that disclosures using the reconstruction frame attempt to tackle the health issue by searching for solutions, these narratives should contain more positive emotions such as hope and optimism. In contrast, the selection of the suffering frame shows the desire to avoid thinking about the illness. Therefore, the narratives using this frame should contain more negative emotions associated with fear of failure. Moreover, given that dealing with a problem using an approach perspective means searching for solutions (Roth & Cohen, 1986), disclosures using approach frames—namely, the reconstruction and advice/support frames—may reveal more cognitive thoughts and therefore more insightful disclosures. Thus, the following hypotheses are posited:

H4: The disclosures using the reconstruction frame will reveal a larger number of positive emotions than the disclosures using other frames.

H5: The disclosures using the suffering frame will reveal a larger number of negative emotions than the disclosures using other frames.

H6: The disclosures using the approach frames will reveal a larger number of insights than the disclosures using the avoidance frames.

Predictors and Health Outcomes of Frame Selection

One approach to improving our understanding of the applicability of the frames generated before is to examine how people use these frames in a real social setting in which they frequently construct health narratives. Social media has emerged as a key player in the online health information landscape. As revealed in a recent survey, 5% of U.S. Internet users used online health support groups, 7% used blogs, and 23% used a social networking site for health information (Chou, Hunt, Beckjord, Moser, & Hesse, 2009). As people often talk about their health issues and exchange their health experiences via social media (Pew Research, 2013), this study examines what frames people use in these media when generating health narratives.

Message format and frame selection. Previous studies identified two types of messages that often appear in such media: personal narrative and informational messages (Preece & Ghozati, 2001; Sundar, Edwards, Hu, & Stavrositu, 2007). Narrative messages, characterized by easily recognizable characters and a coherent story with an identifiable structure including a beginning, middle, and end (Hinyard & Kreuter, 2007) are considered more effective in eliciting emotional responses from audiences (Green, 2006). Prior research has shown that people can be transported into the world of the narrative after reading narrative messages. As a result, they are less likely to engage in counter-arguing (Green & Brock, 2000; Moyer-Guse & Nabi, 2010). This includes generating both thoughts and emotions consistent with the message rather than those that counter the message (Chang, 2008). In the current study, since the message that initiated online discussion describes a person's experience with a common health issue, readers are more likely to report message-congruent feelings and identify with the health issue after reading the narrative message. Therefore, they will be prompted to engage in more disclosures using self-identity frames, namely, the reconstruction and suffering frames, to share their experiences with the health issue.

H7: Narrative messages will induce disclosures using the self-identity frames more frequently than informational messages.

Frame selection and health outcomes. Disclosures using different frames may lead to different results. While prior research generally suggests that health disclosures can influence a variety of health outcomes (Shim et al., 2011; Smyth, 1998), the effects of these disclosures on health behaviors have been inconclusive. According to Pennebaker and Seagal (1999), writing about a health problem might make people more health conscious. However, Smyth's (1998) meta-analysis indicates that health disclosures fail to demonstrate a consistent and positive effect on health behaviors such as exercise or sleeping and eating habits. Given that people may think about behavioral solutions to their health problems when using certain frames while writing, these individuals could be more aware of behaviors that can alleviate their health problems. Specifically, people who choose the approach frames are more focused on problem solving (Roth & Cohen, 1986). Among them, those who choose the reconstruction

frame identify with the health issue and are in the mode of searching for all available solutions to deal with the problem. They may consider behavioral solutions more relevant to their situation after disclosures and are more likely to show a desire to adopt these behaviors. Thus, in the current study, it is hypothesized that health disclosures using the reconstruction frame will elicit the strongest intention to adopt the health behaviors that may alleviate the problem.

H8: Individuals who use the reconstruction frame in disclosures will report stronger behavioral intentions than those who use other frames.

Methods

An experiment was conducted to examine what frames people use to respond to narrative and informational messages on a social media platform and the subsequent effects on behavioral intentions, as well as how the frames selected are associated with emotional/insightful disclosures and narrative modes. This study selected college stress as the health issue discussed for the experiment because national surveys repeatedly note the prevalence of this issue among college students (Lewin, 2011). Results of a pre-test also confirmed that stress is a topic that college students would be willing to write about on the Internet.

Participants

A total 140 college students recruited from a large undergraduate communication course in a U.S. Mid-Atlantic university participated in the study. Among them, 106 voluntarily made a written disclosure on college stress. Therefore, responses from these 106 participants were included in the data analysis. The sample included 67.3% females and 32.7% males. Participant ages ranged from 18 to 23 years (M = 19.33, SD = 1.18). Most participants were Caucasian American (85.8%), while 2.8% were African American, 3.8% were Asian American, 2.8% were Hispanic, 3.8% were multiracial and 0.9% were of other ethnic origins. As for class standing, 33.3% were freshmen, 34.9% were sophomores, 22.6% were juniors, and 9.4% were seniors. In general, participants reported a medium level of stress recently (M = 4.31, SD = 1.41) on a scale from 0 to 6 (0 = *not at all*, 6 = *very much*).

Experimental Design

To facilitate written disclosures about college stress online, web pages of a social media forum were created. The web page presented a discussion thread featuring a personal narrative or an informational post about college stress. The narrative message was a story about a student's experience with stress during her first year of college. The message started with a discussion of her feelings and symptoms. As the narrative progressed, the author described her experience of visiting a doctor. At the end of the message, the writer shared the doctor's advice to get enough sleep as a way to manage her stress. The informational message revealed the same amount of information including the prominence of stress as an issue in college life, the symptoms and consequences of stress, and the suggestion for dealing with the problem by getting enough sleep. The message used the third-person voice and focused on argumentation and reasoning.

To examine the effectiveness of the experimental manipulation, participants were asked to respond to four statements describing the message they just read, such as whether the message provided information using a general or a first-person voice (0 = *strongly disagree*, 6 = *strongly agree*) to indicate whether the message they read was more of a narrative. The items were adapted from established measures used to differentiate narrative vs. informational messages (Parrot, Silk, Dorgan, Condit, & Harris, 2005). The four-item scale was reliable (α = 0.85), and an overall mean was computed. An independent t-test showed that participants who read the narrative message perceived the message to be significantly more like a narrative (M = 3.93, SD = 1.03) than those who read the informational message (M = 1.89, SD = 1.43), $t(83.70) = -8.22$, $p < 0.001$. Therefore, the manipulation worked as intended.

Procedures

Prospective participants received a link directing them to the study's web page. After clicking the button to indicate their agreement to participate in the study, they were randomly assigned to one of the two experimental conditions in which they were exposed either to a narrative or an informational message about college stress. Participants were asked to voluntarily write about college stress to participate in the online discussion. After writing, the participants were asked about their current stress level, their intentions to get sufficient sleep to alleviate the stress problem, and their demographic information.

Measures

This study analyzed the participants' written disclosures using the coding schemes described below. The frames and narrative modes were manually coded. Intercoder reliabilities were calculated based on 53 written responses randomly selected and coded by two trained coders. The SPSS macro developed by Hayes and Krippendorff (2007) for calculating Krippendorff's alpha was used. Krippendorff's alpha was selected because it can be applied to data coded by two coders with any level of measurement. The linguistic inquiry and word count (LIWC) program was used to analyze the disclosure of positive emotions, negative emotions, and insights.

Frames. In total, four frames and one "other" option were developed and coded in the current study. As explained in the literature review, if the participant identified with the stress problem and tried to find a solution, the *reconstruction frame* was coded. If the participant was passive about the stress problem and focused on disclosing and complaining about his or her negative experiences of being stressed without seeking a solution, the *suffering frame* was coded. If the participant did not identify stress as a personal problem, but provided tips to control the problem, the *advice/support frame* was coded. Finally, if the participant did not see stress as part of his or her self-identity and defensively rejected the idea of college stress as a potential issue, the *denial/reactance frame* was coded. In addition to these four frames identified in the literature review, an "other" option was added in case the participants did not use any of the frames mentioned above (Krippendorff's α = 0.91).

To test some of the hypotheses, the frames were recoded into self-identity vs. nonself-identity frames and approach vs. avoidance frames. The reconstruction and suffering frames were coded as *self-identity frames*, while the advice/support and reactance/denial frames were coded as *nonself-identity*

frames. The reconstruction and advice/support frames were coded as *approach frames*, while the suffering and reactance/denial frames were coded as *avoidance frames*.

***Narrative modes*.** Following Angus and her colleagues' definitions of narrative modes (Angus et al., 2004), each sentence of a participant's writing was coded in terms of the narrative mode used. If the participant described an individual experience in the sentence, the *articulation mode* was coded (Krippendorff's α = 0.87). If the participant focused on describing his or her subjective feelings, the *elaboration mode* was coded (Krippendorff's α = 0.78). If the participant described new meaning drawn from the experiences or solutions to his or her problem in the sentence, the *transformation mode* was coded (Krippendorff's α = 0.84). Subsequently, for each participant the total number of sentences per mode for each narrative was calculated.

Emotional and insightful disclosures. To analyze the amount of emotional and insightful disclosures in each participant's writing, the online version of the LIWC program was used. The LIWC software was developed by Pennebaker, Booth, and Francis to count words related to emotional expression and cognitive processing (LIWC, 2007). Examples of positive emotion words include *joy* and *happy*, while examples of negative emotion words include *hurt* and *sad*. The software also codes cognitive words such as *realize*, *understand*, and *think*, reflecting insight and self-reflection (Pennebaker, 1993). After entering each participant's writing into the program, the software calculated the percentage of positive emotion words, negative emotion words, and cognitive words in each narrative.

***Behavioral intentions*.** Given that the experimental message mentioned that sleep could alleviate stress, participants were asked about their intention to get enough sleep as a way to manage stress using two items on a seven-point Likert scale (0 = *strongly disagree*, 6 = *strongly agree*). The measures included "I will try my best to maintain [a] sufficient amount of sleep regularly even when I am stressed about life" and "I won't sacrifice my sleep to deal with my stress." The two-item scale was reliable (α = 0.72). Thus, an overall mean was calculated for each participant.

Demographic information. Demographic variables, including gender, age, race, and class standing, were included at the end of the questionnaire.

Results

Frame Selection

RQ1 asked what frames participants selected for their written disclosures about college stress. Among the 106 participants who volunteered to write a response to participate in the online discussion, 38 participants (35.8%) used the reconstruction frame, 35 participants (33.0%) used the suffering frame, 27 participants (25.5%) used the advice/support frame, and two participants (1.9%) used the denial/reactance frame. Since the number of participants who used the denial/reactance frame was small, the disclosures using this frame were removed from the data analysis. In addition, four participants (3.8%) used the "other" frame. These participants wrote questions and concerns about the design of the present study or on an irrelevant topic. Thus, these disclosures were also excluded from further analysis.

Frames and Narrative Modes

Hypothesis 1 proposed that the disclosures using self-identity frames would demonstrate more frequent use of the articulation mode. An ANOVA analysis revealed a main effect of self-identity frames on the articulation mode, $F(1, 99) = 5.15$, $p < 0.05$, partial $\eta^2 = 0.05$. More specifically, the results suggested that when participants used self-identity frames ($M = 1.39$, $SE = 0.18$), they were involved in the articulation mode more often than when they used nonself-identity frames ($M = 0.58$, $SE = 0.30$). Message format did not affect the dependent variable, F (1, 99) = 0.02, $p = 0.88$, partial $\eta^2 = 0.00$ (Narrative: $M = 1.01$, $SE = 0.21$; Informational: $M = 0.96$, $SE = 0.26$). H1 was supported.

Hypothesis 2 proposed that the disclosures using self-identity frames would demonstrate more frequent use of the elaboration mode. This time an ANOVA analysis revealed a main effect of message format on elaboration, F (1, 99) = 4.96, $p < 0.05$, partial $\eta^2 = 0.05$ but not an effect of self-identity frames on elaboration, F (1, 99) = 0.07, $p = 0.79$, partial $\eta^2 = 0.00$. The narrative message ($M = 0.97$, $SE = 0.22$) elicited less elaboration than the informational message ($M = 1.71$, $SE = 0.27$). However, after controlling for the experimental variable, the frames selected by participants had no effect on the use of the elaboration mode (self-identity frames: $M = 1.39$, $SE = 0.19$; nonself-identity frames: $M = 1.29$, $SE = 0.32$). H2 was rejected.

Hypothesis 3 proposed that the disclosures using approach frames would demonstrate more frequent use of the transformation mode. Findings of an ANOVA test demonstrated that the use of the transformation mode varied as a function of both message format, F (1, 99) = 7.29, $p < 0.01$, partial $\eta^2 = 0.07$ and approach-avoidance frames, F (1, 99) = 10.03, $p < 0.01$, partial $\eta^2 = 0.09$. Specifically, the narrative message ($M = 2.39$, $SE = 0.26$) elicited more use of the transformation mode than the informational message ($M = 1.41$, $SE = 0.26$). The use of approach frames ($M = 2.50$, $SE = 0.22$) was associated with more frequent use of the transformation mode than avoidance frames ($M = 1.30$, $SE = 0.30$; see Table 1). H3 was supported.

Table 1. Frame Selection and Narrative Modes.

	DVs								
	Articulation Mode (H1)			Elaboration Mode (H2)			Transformation Mode (H3)		
IVs	*F*	*p*	partial η^2	*F*	*p*	partial η^2	*F*	*p*	partial η^2
Message format	0.02	0.88	0.00	4.96	0.03	0.05	7.29	0.01	0.07
Self/Nonself-identity	5.15	0.03	0.05	0.07	0.79	0.00			
Approach/ Avoidance							10.03	0.00	0.09

Frames and Emotional and Insightful Disclosures

With regard to emotional disclosures, Hypothesis 4 proposed that the disclosures using the reconstruction frame would contain the largest number of positive emotions. The results of the ANOVA analysis showed that positive emotional disclosures did not vary as a function of message format, F (1, 99) = 0.11, p = 0.74, partial η^2 = 0.001 (Narrative: M = 3.10, SE = 0.30, Informational: M = 2.77, SE = 0.33) or frame selection, F (1, 99) = 2.44, p = 0.09, partial η^2 = 0.05 (Reconstruction: M = 1.30, SE = 0.30, Suffering: M = 1.84, SE = 0.42, Advice/Support: M = 3.10, SE = 0.49). Therefore, H4 was rejected.

Hypothesis 5 proposed that the disclosures using the suffering frame would contain the largest number of negative emotional disclosures. An ANOVA test revealed that the use of negative emotion words did not vary as a function of message format, F (1, 99) = 0.54, p = 0.46, partial η^2 = 0.01 (Narrative: M = 2.54, SE = 0.34, Informational: M = 2.93, SE = 0.40). However, frame selection did make a difference in the frequency of negative emotion words used, F (2, 99) = 4.00, $p < 0.05$, partial η^2 = 0.08. Specifically, written disclosures using the suffering frame (M = 3.64, SE = 0.37) contained significantly more negative emotion words than those using the reconstruction frame (M = 2.22, SE = 0.35). However, no significant difference was found when comparing the disclosures using the suffering frame with those using the advice/support frame (M = 2.94, SE = 0.42; see Table 2). Therefore, H5 was only partially supported.

Table 2. Frame Selection and Emotional Disclosures.

	Positive Emotional Disclosures (H4)			Negative Emotional Disclosures (H5)		
Independent Variables	*F*	*p*	partial η^2	*F*	*p*	partial η^2
Message format	0.11	0.74	0.00	0.54	0.46	0.01
Frame	2.44	0.09	0.05	4.00	0.02	0.08

Hypothesis 6 proposed that the disclosures using approach frames would contain significantly more cognitive words. The ANOVA results suggested that the use of cognitive words in written disclosures did not vary as a function of message format, F (1, 99) = 2.94, p = 0.09, partial η^2 = 0.03 (Narrative: M = 7.25, SE = 0.58, Informational: M = 8.66, SE = 0.59) or frame selection, F (1, 99) = 0.93, p = 0.34, partial η^2 = 0.01 (Approach: M = 7.54, SE = 0.50, Avoidance: M = 8.37, SE = 0.68; see Table 3). Thus, H6 was rejected.

Table 3. Frame Selection and Insightful Disclosures.

	Insightful Disclosures (H6)		
Independent Variables	*F*	*P*	partial η^2
Message format	2.94	0.09	0.03
Approach/Avoidance	0.93	0.34	0.01

Message Format, Frame Selection, and Behavioral Intentions

Hypothesis 7 proposed that the narrative message would elicit more written disclosures using self-identity frames, namely the reconstruction and suffering frames, than the informational message. To test this hypothesis, a chi-square analysis was performed. The results suggested that message format made a significant difference to frame selection, χ^2 (2, N = 100) = 8.41, $p < 0.05$, Cramer's V = 0.29. However, contrary to the hypothesis, the narrative message, when compared with the informational message, elicited more disclosures using the advice/support frame, which is a nonself-identity frame, but not those using self-identity frames. In fact, the narrative message elicited significantly fewer disclosures using the suffering frame than the informational message (see Table 4 for post hoc test results). H7 was rejected.

Table 4. Effect of Message Format on Frame Selection.

	Narrative Message	Informational Message
Reconstruction frame	38.90%$_a$	37.00%$_a$
Suffering frame	24.10%$_a$	47.80%$_b$
Advice/support frame	37.00%$_a$	15.20%$_b$

Note: Using Holm's sequential bonferroni post hoc comparisons within rows, percentages with no lower case subscript in common differ at p < 0.05.

Hypothesis 8 proposed that the disclosures using the reconstruction frame would demonstrate the greatest behavioral intentions. An ANOVA test suggested that behavioral intentions did not vary as a function of message format, F (1, 99) = 1.51, p = 0.22, partial η^2 = 0.02 (Narrative: M = 3.84, SE = 0.18, Informational: M = 4.17, SE = 0.20) but frame selection did make a difference to behavioral intentions, F (2, 99) = 3.57, $p < 0.05$, partial η^2 = 0.07. Specifically, participants who used the advice/support frame (M = 4.55, SE = 0.26) to construct their disclosures reported the highest level of behavioral intentions, followed by participants who selected the reconstruction frame (M = 3.83, SE = 0.22) and the suffering frame (M = 3.64, SE = 0.23; see Table 5). H8 was rejected.

Table 5. Effects of Message Format and Frame Selection on Behavioral Intentions.

	Behavioral Intentions (H8)		
Independent Variables	F	p	partial η^2
Message format	1.50	0.22	0.02
Frame	3.57	0.03	0.07

Discussion

Framing theory has frequently been used to understand health-related narratives. Numerous research studies have found that the frame used to construct one's social reality influences decision making (Rothman & Salovey, 1997). To improve our ability to predict the effects of various frames, this study generated four generic frames to study health-related narratives.

Frames and Narrative Modes

The results suggest that the frames correlate with the disclosure features measured in previous models. In particular, scholars argued that whether individuals consider the illness as part of their self-identity determines how well they adapt to their new state of health (Mathieson & Stam, 1995). Consistent with the hypothesis, when people recognized the illness as part of their self-identity by using the reconstruction or suffering frame, they admitted the illness experiences and relied heavily on the articulation mode to discuss their own experiences. Furthermore, when they adopted the approach frames that show an emphasis on personal responsibility to solve one's health problem (Roth & Cohen, 1986), they relied heavily on the transformation mode to construct their disclosures. These confirmatory results show that the frames developed before successfully predicted communication patterns.

However, the study did not find that the health narratives using the self-identity frames contained more frequent use of the elaboration modes. There are several possible explanations for this finding. First, the topic of the current study may not trigger emotional expression as strong as other health issues such as cancer. Second, the one-time writing task may not allow participants to express their emotions sufficiently. If participants were invited to write for several consecutive days, they may be more inclined to express their feelings.

Frames and Emotional/Insightful Disclosures

According to Gamson and Modigliani (1989), a frame refers to a selection of interpretational packages that contain a special combination of language, symbols, metaphors, and other devices. Based on this definition, this study predicted that the use of different frames would correlate with different linguistic patterns, including the use of positive emotion words, negative emotion words, and cognitive words.

The results partially confirmed the hypothesis regarding negative emotional disclosures because the health-related narratives using the suffering frame contained more negative emotion words than the narratives using the reconstruction frame. The use of the suffering frame not only indicated the admission of the relevance of the health issue to the author but also suggested a subjective evaluation that the stress problem was uncontrollable. Therefore, it was understandable that participants using the suffering frame expressed more negative feelings than those who used the reconstruction frame. However, there was no statistically significant difference between the disclosures using the suffering frame and those using the advice/support frame with regard to negative emotional disclosures. Moreover, frame selection

did not make a difference to positive emotional disclosures. Again, these findings may be related to the issue that those who use the self-identity frames and nonself-identity frames often expressed emotions similarly in their written disclosures as found in the current study. Solutions to address this issue have been provided before.

Furthermore, contrary to the hypothesis, this study found that disclosures using the reconstruction and advice/support frames did not contain more cognitive words than those with other frames. Given that this study also found disclosures organized using these two frames used the transformation mode more frequently, this finding appears to be contradictory and is particularly interesting. To measure insightful disclosures, this study followed previous investigations by using LIWC, which calculates the percentage of words that reflect the cognitive processing used in each narrative. However, cognitive processing may not be equivalent to finding solutions to one's problems. In other words, the current study confirms the argument proposed by Shaw and his colleagues (2006) that the insightful words used in health narratives only suggest one's efforts to re-conceptualize his or her health problems but not necessarily find solutions to the health problems. Therefore, the findings together suggest that it is more beneficial to encourage people to write using the reconstruction or advice/support frame because they lead to increased use of the transformation mode instead of using cognitive words that do not necessarily lead to problem solving.

Message Format, Health Disclosures, and Health Behavior

This study posited that the narrative message that people read in an online forum would trigger a transportation process that might facilitate more disclosures using self-identity frames. However, the results showed that self-identity frames were not more frequently adopted by participants who read the narrative messages. Indeed, in contrast, the present study found that the narrative message elicited more disclosures using the advice/support frame. One explanation for this finding may be that the narrative message presented the struggles of the stressed individual in vivid detail, which elicited more sympathy from the readers (Chang, 2008). As a result, participants used the advice/support frame more often to show their sympathy and willingness to help.

In addition to many benefits of health disclosures identified in the previous research, this study demonstrates that the use of the advice/support frame increases the intentions to adopt specific health behaviors that may help alleviate the health problem. The finding is consistent with previous results that writing makes people more health conscious (Pennebaker & Seagal, 1999). In particular, writing using the advice/support frame means writing that focuses on finding solutions to a health problem while maintaining a degree of detachment. In other words, when people construct their disclosures using this frame, they constantly think about the health behaviors that help a person to cope with the problem. However, unlike those who are afflicted with the problem, these individuals may be less concerned about the obstacles to taking action, which promotes more positive behavioral intentions. More studies need to be conducted to determine whether the positive impact of disclosures using the advice/support frame can be translated into practicing the actual health behaviors.

Practical Implications

The positive findings associated with the advice/support frames suggest that health professionals and practitioners can improve people's health behavioral intentions by helping them construct health-related narratives using this particular frame. In practice, individuals can be instructed to create a narrative using an approach perspective to help others overcome a health problem. The health problem may also be the problem that the writers have experienced. However, without identifying themselves as the struggling patients, the writers can generate a list of behavioral solutions. These suggestions can help the writers recognize what to do for their own situations and increase intentions to engage in these behaviors.

Limitations and Future Studies

The study has several limitations. First, the generic frames were generated based on the individual's approach vs. avoidance coping style. While in the current study frame, selection is understood as a situational practice, previous literature suggests that dispositional tendencies may influence people to choose one coping style rather than another and affect the frame used for health disclosures (Roth & Cohen, 1986). The effects of individual differences on frame selection are worthy of further investigation. Second, the same dataset that resulted from the experiment was used to assess the relationships among the four frames and narrative modes and emotional/insightful disclosures. Due to the experimental design, these relationships may need to be explained in light of the experimental manipulation. A better assessment might result from conducting a separate content analysis of messages in health-related social media.

As an exploratory study investigating the applicability of the four original generic frames, this study asked participants to engage in a one-time writing task. To what extent social desirability bias influenced their writing is unknown. Future studies should ask people to write for several consecutive days. Doing so can better measure people's interest in participating in disclosures and reduce the writers' concerns when expressing their thoughts and feelings. The effects of health disclosures may also be more profound when achieving a certain level of intensity. In addition, transportation should also be measured to improve our understanding about why one frame is selected over another. Finally, the temporal sequence of the tasks assigned to the participants in the current study suggests that written disclosures prime the participants and influence their responses to the measures of behavioral intentions. However, the current study cannot exclude the possibility that the disclosures may be affected by predetermined health attitudes and behavioral intentions and reflect these thoughts. A longitudinal design will be used in future research.

Nevertheless, despite these limitations, this study provides evidence that the reconstruction, suffering, and advice/support frames can be used to understand how people construct health-related disclosures. In so doing, it offers health professionals and communicators a valuable tool for increasing patients' consciousness about their health and promoting healthy behaviors.

References

Angus, L., & Hardtke, K. (1994). Narrative processes in psychotherapy. *Canadian Psychology, 35*, 190–203. doi:10.1037/0708-5591.35.2.190

Angus, L., Lewin, J., Bouffard, B. M., & Rotondi-Trevisan, D. (2004). "What's the story?" Working with narrative in experiential psychotherapy. In L. Angus & J. McLeod (Eds.), *The handbook of narrative and psychotherapy: Practice, theory and research* (pp. 87–101). Thousand Oaks, CA: SAGE Publications.

Bisceglio, P. (2013, August 20). How social media is changing the way we approach death. *The Atlantic*. Retrieved from http://www.theatlantic.com/health/archive/2013/08/how-social-media-is-changing-the-way-we-approach-death/278836

Bury, M. (2001). Illness narratives: Fact or fiction? *Sociology of Health & Illness, 23*, 263–285. doi:10.1111/1467-9566.00252

Chang, C. (2008). Increasing mental health literacy via narrative advertising. *Journal of Health Communication, 13*, 37–55. doi:10.1080/10810730701807027

Charmaz, K. (1983). Loss of self: A fundamental form of suffering in the chronically ill. *Sociology of Health and Illness, 5*, 168–195. doi:10.1111/1467-9566.ep10491512

Charmaz, K. (2002). Stories and silences: Disclosures and self in chronic illness. *Qualitative Inquiry, 8*, 302–328. doi:10.1177/107780040200800307

Chou, W. Y. S., Hunt, Y. M., Beckjord, E. B., Moser, R. P., & Hesse, B. W. (2009). Social media use in the United States: Implications for health communication. *Journal of Medical Internet Research, 11*(4). doi:10.2196/jmir.1249

Creswell, J. D., Lam, S., Stanton, A. L., Taylor, S. E., Bower, J. E., & Sherman, D. K. (2007). Does self-affirmation, cognitive processing, or discovery of meaning explain cancer-related health benefits of expressive writing? *Personality and Social Psychology Bulletin, 33*, 238–250. doi:10.1177/0146167206294412

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*, 169–189. doi:10.1207/s15326985ep3403_3

Entman, R. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication, 43*, 51–58. doi:10.1111/j.1460-2466.1993.tb01304.x

Finset, A., & Andersson, S. (2000). Coping strategies in patients with acquired brain injury: Relationships between coping, apathy, depression and lesion location. *Brain Injury, 14*, 887–905. doi:10.1080/026990500445718

Gamson, W. A., & Modigliani, A. (1989). Media discourse and public opinion on nuclear power: A constructionist approach. *American Journal of Sociology*, *95*, 1–37. doi:10.1086/229213

Gray, J. B. (2009). The power of storytelling: Using narrative in the healthcare context. *Journal of Communication in Healthcare, 2,* 258–273.

Graybeal, A., Sexton, J. D., & Pennebaker, J. W. (2002). The role of story-making in disclosure writing: The psychometrics of narrative. *Psychology and Health, 17*, 571–581. doi:10.1080/08870440290025786

Green, M. C. (2006). Narratives and cancer communication. *Journal of Communication, 56*, 163–183. doi:10.1111/j.1460-2466.2006.00288.x

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79*, 701–721. doi:10.1037/0022-3514.79.5.701

Hayes, A. F., & Krippendorff, K. (2007). Answering the call for a standard reliability measure for coding data. *Communication Methods and Measures, 1*, 77–89. doi:10.1080/19312450709336664

Hertog, J. K., & McLeod, D. M. (2001). A multiperspectival approach to framing analysis: A field guide. In S. D. Reese, O. H. Gandy, & A. E. Grant (Eds.), *Framing public life: Perspectives on media and our understanding of the social world* (pp. 139–161). Mahwah, NJ: Lawrence Erlbaum.

Hinyard, L. J., & Kreuter, M. W. (2007). Using narrative communication as a tool for health behavior change: A conceptual, theoretical, and empirical overview. *Health Education & Behavior, 34*, 777–792. doi:10.1177/1090198106291963

Lewin, T. (2011, January 26). Record level of stress found in college freshmen. *The New York Times*. Retrieved from http://www.nytimes.com/2011/01/27/education/27colleges.html?_r=0

Linguistic Inquiry & Word Count (LIWC). (2007). *Linguistic inquiry and word count*. Retrieved from http://www.liwc.net/howliwcworks.php

Mathieson, C. M., & Stam, H. J. (1995). Renegotiating identity: Cancer narratives. *Sociology of Health & Illness, 17*, 283–306. doi:10.1111/1467-9566.ep10933316

Moyer-Guse, E., & Nabi, R. L. (2010). Explaining the effects of narratives in an entertainment television program: Overcoming resistance to persuasion. *Human Communication Research, 36,* 26–52. doi:10.1111/j.1468-2958.2009.01367.x

Parrott, R., Silk, K., Dorgan, K., Condit, C., & Harris, T. (2005). Risk comprehension and judgments of statistical evidentiary appeals: When a picture is not worth a thousand words. *Human Communication Research, 31*, 423–452. doi:10.1111/j.1468-2958.2005.tb00878.x

Pennebaker, J. W. (1993). Putting stress into words: Health, linguistic, and therapeutic implications. *Behaviour Research and Therapy, 31*, 539–548. doi:10.1016/0005-7967(93)90105-4

Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology, 95*, 274–281. doi:10.1037/0021-843X.95.3.274

Pennebaker, J. W., & Seagal, J. D. (1999). Forming a story: The health benefits of narrative. *Journal of Clinical Psychology, 55*, 1243–1254. doi:10.1002/(SICI)1097-4679(199910)55:10<1243::AID-JCLP6>3.0.CO;2-N

Pew Research Internet Project. (2013). *Health online 2013*. Retrieved from http://pewinternet.org/Reports/2013/Health-online.aspx

Preece, J. I., & Ghozati, K. (2001). Experiencing empathy online. In R. E. Rice, & J. E. Katz (Eds.), *The Internet and health communication* (pp. 237–260). Thousand Oaks, CA: SAGE Publications.

Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American Psychologist, 41*, 813–819. doi:10.1037/0003-066X.41.7.813

Rothman, A. J., & Salovey, P. (1997). Shaping perceptions to motivate healthy behavior: The role of message framing. *Psychological Bulletin, 121*, 3–19. doi:10.1037/0033-2909.121.1.3

Shaw, B. R., Hawkins, R., McTavish, F., Pingree, S., & Gustafson, D. H. (2006). Effects of insightful disclosure within computer mediated support groups on women with breast cancer. *Health Communication, 19*, 133–142. doi:10.1207/s15327027hc1902_5

Shim, M., Cappella, J., & Han, J. Y. (2011). How does insightful and emotional disclosure bring potential health benefits? Study based on online support groups for women with breast cancer. *Journal of Communication, 61*, 432–454. doi:10.1111/j.1460-2466.2011.01555.x

Sloan, D. M., & Marx, B. P. (2004). A closer examination of the structured written disclosure procedure. *Journal of Consulting and Clinical Psychology, 72*, 165–175. doi:10.1037/0022-006x.72.2.165

Smyth, J. (1998). Written emotional expression: Effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology, 66*, 174–184. doi:10.1037/0022-006X.66.1.174

Stanton, A. L., Danoff-Burg, S., & Huggins, M. E. (2002). The first year after breast cancer diagnosis: Hope and coping strategies as predictors of adjustment. *Psycho-Oncology, 11*, 93–102. doi:10.1002/pon.574

Sullivan, M. J. L., Mikail, S., & Weinshenker, B. (1997). Coping with a diagnosis of multiple sclerosis. *Canadian Journal of Behavioural Science, 29*, 249–256. doi:10.1037/0008-400X.29.4.249

Sundar, S. S., Edwards, H. H., Hu, Y., & Stavrositu, C. (2007). Blogging for better health: Putting the "public" back in public health. In M. Tremayne (Ed.), *Blogging, citizenship, and the future of media* (pp. 83–102). New York, NY: Routledge.

Witte, K., & Allen, M. (2000). A meta-analysis for fear appeals: Implications for effective public health campaigns. Health Education & Behavior, *27*, 591–615. doi:10.1177/109019810002700506