14 Message frames and illness representations

Implications for interventions to promote and sustain healthy behavior

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Given the premise that people are motivated to maximize their health and well-being, one might expect that providing people with valuable information about their health would not be complicated. Yet, effectively communicating health information has proven deceptively difficult. People fail to recognize, understand, or retain health information; even when this information is remembered, it does not necessarily affect behavior (Salovey et al., 1998).

In response to this state of affairs, it has been proposed that people differ in their readiness to modify their behavior, and consequently messages must be targeted to a person's informational needs (Prochaska et al., 1992). However, the conceptual basis for identifying what information a particular person or group of people require is not well specified (Weinstein et al., 1998). Even if messages could be designed to meet an individual's informational needs, the question remains as to how the information should be communicated. Who should communicate the information: for example, are peers a more credible source than parents? And how should the information be framed: for example, should the benefits of taking action or the costs of failing to take action be emphasized? Although all aspects of the communication process are important, in this chapter we focus on the latter question and examine how framing health appeals in terms of the costs or benefits of action can affect behavioral decisions.

The material in this chapter is organized around two themes. First, we review research on message framing and health behavior and evaluate the degree to which the empirical evidence available supports a theoretical framework outlined by Rothman and Salovey (1997). Second, we identify the next phase of research in this area and articulate how framed health appeals could be used to sustain ongoing behavioral practices. This approach to framing health promotion communications is grounded on the premise that to be effective, framed appeals must correspond to people's representations of the health behavior and thus investigators must be attentive to how these representations may change with repeated use of the behavior.

Preference reversals: an illustration of message framing

Information about health behaviors can focus on either the benefits of performing them or the costs of failing to perform them. For example, a brochure to promote skin cancer screening could adopt a gain-frame (i.e., emphasizing the benefits afforded by screening) or a loss-frame (i.e., focusing on the costs of failing to be screened). According to the framing postulate of Prospect Theory (Tversky and Kahneman, 1981), how information is framed elicits systematic differences in people's preferences. Specifically, people act to avoid risks when considering the potential gains afforded by their decision (they are risk-averse in their preferences), but take risks when considering the potential losses afforded by their decision (they are risk-seeking in their preferences).

The empirical basis for this postulate rests primarily on people's responses to hypothetical scenarios framed in terms of gains or losses. For example, people are informed about an epidemic that is expected to affect 600 individuals and have to choose between two interventions to combat the disease (Tversky and Kahneman, 1981). Although each intervention affords the same expected utility, one offers a certain outcome, whereas the other offers an uncertain or risky outcome. In the gain-framed condition, the interventions are described in terms of the number of lives that would be saved (e.g., if Program A is adopted, 200 people will be saved; if Program B is adopted, there is a 1/3 probability that all 600 people will be saved, and a 2/3 probability that nobody will be saved). In the loss-framed condition, the interventions are presented in terms of the number of lives that would be lost (e.g., if Program C is adopted, 400 people will die; if Program D is adopted, there is a 1/3 probability that nobody will die, and a 2/3 probability that all 600 people will die). When presented with information about the number of lives that could be saved, most people prefer the program that offers a certain gain (i.e., Program A). Yet, when presented with information about the number of lives that could be lost, most people reject the program describing a certain loss in favor of the one that offers a risky outcome (i.e., Program D).

Why do preferences depend on how the programs are framed? Although the specific cognitive processes that underlie the impact of framed information on choice are not well specified, the differential response to gain- and loss-framed information is thought to reflect the shape of the value function that relates objective outcomes (e.g., losing 200 lives) to subjective values (e.g., the distress elicited by losing 200 lives). In the domain of losses, the value function is steep as people find even modest losses distressing (Taylor, 1991). Furthermore, the shape of the function is convex, such that increases in potential losses have a rapidly diminishing impact on the perceived value of the outcome. If the subjective cost of losing 600 lives is not appreciably greater than losing 400 lives, people accept the risk of a larger loss in order to try to avoid any losses. In the domain of gains, the shape of the value function is concave, and thus the satisfaction derived from any increase in
potential gains is associated with relatively smaller increases in perceived value. However, in the domain of gains, the modest improvement in value leads people to be risk-averse rather than risk-seeking in their preferences (i.e., the increase in value associated with saving 600 rather than 400 lives is not worth the risk of saving no lives).

Some investigators have expressed concern about failures to replicate the preference reversal predicted by Prospect Theory (e.g., Fagley and Miller, 1990; Wang, 1996; for a meta-analytic review see Kuhberger et al., 1999). Although people’s preferences are contingent on whether a decision involves potential gains or losses, investigators have tended to ignore whether there is any variability in how people construe a framed outcome (but see Elliott and Archibald, 1989; Levin and Chapman, 1990). People’s preferences for a certain or an uncertain outcome should depend on whether the outcome is perceived as unfavorable or favorable (Rothman et al., 2000). For example, when asked to choose between two fitness programs that offer the potential to lose weight, people’s preferences shifted depending on how they construed the opportunity to lose weight. People who perceived losing weight to be a desirable outcome preferred the program promising the certain weight loss, whereas those who perceived losing weight to be an undesirable outcome preferred the program offering an uncertain outcome. Participants’ preferences for meal plans offering a certain or uncertain opportunity to gain weight similarly reflected the perceived desirability of weight gain. The difficulties investigators have had conceptually replicating the preference reversal specified by Prospect Theory may be due, in part, to variability in how outcomes are construed.

### Applying message framing to health communications

Predictions regarding message-framing effects on decision-making are contingent on the status of two parameters: the relative desirability and (uncertainty of the potential outcomes. In tests of framing effects that involve hypothetical problems, these features are relatively easy to manipulate. First, gain- and loss-framed information is constructed by describing an outcome in relation to a particular reference point. Second, two response options are provided that differ systematically in the relative risk that an outcome is obtained – where risk is formally defined as the probability associated with obtaining a given outcome. The fact that framing can affect people’s preferences systematically within the context of hypothetical scenarios is noteworthy, but what happens when it is applied to decision-making in more naturalistic situations, such as those involving personal health practices?

When message frames are integrated into health recommendations, operationalizing the underlying concepts of desirability and certainty can be complicated. First, decisions regarding a health behavior often do not involve a choice between two distinct options, but rather focus on whether or not to adopt a recommended course of action. For example, a woman must decide whether or not to schedule a mammogram. In these contexts, gain- and loss-framed information is operationalized as the benefits of engaging in the behavior and the costs of failing to engage in the behavior, respectively. Second, the risk associated with a given behavior is not defined in terms of the actual likelihood of a particular outcome. Instead, the relative risk posed by performing a behavior is conceptualized as the subjective perception that it will afford an unpleasant outcome. For example, choosing to perform a detection behavior could be perceived as risky, because by deciding to be screened for a potential health problem, one ‘runs the risk’ of receiving significant, unpleasant information.

Given the complexity of translating a paradigm based on preferences within hypothetical scenarios to behavioral choices in response to health appeals, efforts to generate and test predictions regarding the relative impact of loss- and gain-framed appeals on health practices must be thoughtful. In particular, any predictions regarding the effects of message framing on health decision-making need to be grounded in the conceptual framework delineated by Prospect Theory (Rothman and Salovey, 1997). According to Prospect Theory, people are more willing to take risks when faced with loss-framed information, whereas they are more risk-averse in their preferences when faced with gain-framed information. Thus, the effect of a particular frame on people’s willingness to perform a behavior is contingent on whether the option under consideration is perceived to reflect a risk-averse or risk-seeking course of action.

Consistent with the underlying tenets of Prospect Theory, a taxonomy of situations can be developed that affords predictions as to when gain- or loss-framed health appeals are maximally persuasive. When people are considering a behavior that they perceive involves some risk or uncertainty (e.g., it may detect a health problem), loss-framed appeals are more persuasive, but when people are considering a behavior that they perceive involves a relatively certain outcome (e.g., it prevents the onset of a health problem), gain-framed appeals are more persuasive. Moreover, the function served by a health behavior can operate as a reliable heuristic to predict which behaviors people tend to perceive as risky and which behaviors people tend to perceive as relatively certain or safe. Detection behaviors such as breast self-examination (BSE) or mammography serve to detect the presence of a health problem, and because they can inform people that they may be sick, initiating the behavior may be considered a risky decision. Although detection behaviors such as mammography provide critical long-term benefits, characterizing them as risky accurately captures people’s subjective assessments of these behaviors (e.g., Lerman and Rimer, 1993; Mayer and Solomon, 1992; Meyerowitz and Chaiken, 1987). In contrast, prevention behaviors such as the regular use of sunscreen or condoms forestall the onset of an illness and maintain a person’s current health status. In fact, these behaviors are risky only to the extent that one chooses not to take
action. Taken together, this distinction suggests that loss-framed appeals would be more effective in promoting the use of detection behaviors but gain-framed appeals would be more effective in promoting the use of prevention behaviors (Rothman and Salovey, 1997).

Detection behaviors

Do loss-framed messages elicit greater interest in and use of detection behaviors? Our efforts to test this thesis have focused primarily on interventions to promote the use of screening mammography. According to current guidelines, women are encouraged to obtain mammograms annually after the age of 50. Mammograms, like most screening procedures, are designed to detect indicators of a health problem — in this case, abnormalities in breast tissue that could be cancerous. Because obtaining a mammogram involves the risk of discovering a health problem, a loss-framed appeal should be more effective than a gain-framed appeal in motivating women to have the procedure.

In an initial test of this prediction, women working at a telephone company who were not complying with prevailing mammography guidelines viewed a fifteen-minute videotape on breast cancer and mammography that emphasized either the costs of not being screened or the benefits of being screened. Women were then contacted a year later to ascertain who had obtained a mammogram. Although the two videos were rated equal in quality, women who viewed the loss-framed video were more likely to have subsequently obtained a mammogram than were women who viewed the gain-framed video (66.2 per cent compared to 51.5 per cent; Banks et al., 1995). Similar findings have been obtained from an intervention directed at women recruited from community health clinics and public housing developments (Schneider et al., 2001).

The finding that loss-framed appeals are more effective than gain-framed appeals when promoting screening mammography is consistent with the results obtained by other investigators who have tested the impact of message frame on people's interest in or use of a detection behavior. A loss-framed advantage has been obtained in studies involving BSE (Meyerowitz and Chaiken, 1987), mammography (Cox and Cox, 2001), HIV-testing (Kalichman and Coley, 1995), amniocentesis (Marieau, 1989), skin cancer examinations (Block and Keller, 1995; Rothman et al., 1996), and blood-cholesterol screening (Maheswaran and Meyers-Levy, 1990). Although three studies have reported a failure to find an advantage for either frame (Lalor and Hailey, 1990; Lauver and Rubin, 1990; Lerman et al., 1992), two of them involved efforts to get women to take action following an abnormal screening test (Lauver and Rubin, 1990; Lerman et al., 1992). As we discuss later in this chapter, how women respond to an abnormal test may create meaningful variability in how a screening test is construed, and thus mitigate any systematic effect of framing. Given the thesis that choosing to perform a

detection behavior is construed as a risky option, the pattern of results across these studies is consistent with the prediction that people are more willing to take risks when faced with information about losses.

Prevention behaviors

Because prevention behaviors typically afford people the opportunity to maintain their health and minimize the risk of illness, gain-framed messages are predicted to elicit greater interest in and use of prevention behaviors. To date, only a few studies have tested the impact of gain- and loss-framed appeals on prevention behaviors, but of those that have been conducted a consistent advantage for gain-framed appeals has been found; for example, in studies on the use of condoms (Linvile et al., 1993), and sunscreen (Detweiler et al., 1999; Rothman et al., 1993).

The pair of studies that examined people's interest in the use of sunscreen has provided the most rigorous test of the effect of message frame on prevention behaviors. In an initial study, a sample of undergraduate men and women read either a gain- or a loss-framed pamphlet about skin cancer and sunscreen use (Rothman et al., 1993, Experiment 2). After reading the pamphlet, participants were given the opportunity to request a free sample of sunscreen with a sun protection factor (SPF) of 2, 6, 8, or 15. Because sunscreen must have an SPF of 15 or higher to effectively prevent skin cancer, requests for sunscreen with an SPF of 15 were compared across conditions. Consistent with our predictions, students who read the gain-framed pamphlet were more likely to request an SPF of 15 than were those who read the loss-framed pamphlet. However, this effect was limited to the women who had enrolled in the study. Of the women who read a gain-framed pamphlet, 79 per cent requested sunscreen with an SPF of 15 as compared to 45 per cent who read the loss-framed pamphlet. For men, requests rates were 50 per cent and 47 per cent, respectively.

One reason why the gain-frame advantage might have been limited to women was that conducting the study during the winter in New England rendered the issue meaningful only to those people for whom skin care and protection is of chronic interest (i.e., women). In order to examine this thesis, a follow-up intervention was conducted during the summer on a public beach — a setting in which skin care and skin cancer should be of interest to everyone. People entering the beach were given either a gain- or loss-framed brochure about skin cancer (Detweiler et al., 1999). After reading the brochure, participants received a coupon that they could exchange for a free sample of sunscreen from a 'distributor' several hundred yards down the beach. Consistent with our predictions, participants who read the gain-framed brochure were more likely to exchange their coupons for a free sample than were those who read the loss-framed brochure (71 per cent compared to 53 per cent, respectively). Moreover, the same pattern of results was obtained for men and women beach-goers.
Testing the distinction between detection and prevention

The empirical findings obtained across a broad range of studies have been consistent with the framework outlined by Rothman and Salovey (1997), yet any conclusions regarding the factors that determine the relative influence of gain- and loss-framed appeals are limited because comparisons are being drawn across studies and across health domains. The numerous differences between the health domains and health behaviors studied make it difficult to assert unequivocally that the influence of a framed appeal is contingent on the function of the behavior. Even within a single health domain, prevention and detection behaviors (e.g., the use of condoms and HIV testing) can differ on dimensions such as cost, familiarity, difficulty, frequency, and the need for trained personnel to perform the behavior. These substantial differences leave open the possibility of alternative explanations for the observed pattern of findings.

In order to confirm that the function of the health behavior determines the relative influence of gain- and loss-framed appeals, a series of studies was conducted that involved experimentally manipulating whether a single health behavior prevented or detected a health problem. In one study, college undergraduates received either a loss- or gain-framed pamphlet about a mouth rinse (Rothman et al., 1999, Experiment 2). For half of the students, the mouth rinse was described as an effective means to prevent the build-up of plaque (i.e., a prevention behavior), whereas for the remaining students the mouth rinse was described as an effective means to detect the build-up of plaque (i.e., a detection behavior). In both cases, the same behavior was described—i.e., to briefly gargle with a small amount of the mouth rinse. By manipulating both message frame and the function of the behavior within a single experiment, we were able to test for the predicted ‘frame by behavior function’ interaction. Consistent with predictions, the persuasiveness of the framed pamphlet was contingent on the function served by the mouth rinse. When the mouth rinse was described as a way to prevent the build-up of plaque, participants were more likely to request a free sample after having read the gain-framed rather than the loss-framed pamphlet (67 percent and 47 percent, respectively). However, when the mouth rinse was described as a way to detect the build-up of plaque, participants were more likely to request a free sample after having read the loss-framed as opposed to the gain-framed pamphlet (73 percent and 37 percent, respectively).

Taken together with the findings obtained in studies that focused solely on a prevention or a detection behavior, a compelling body of evidence has developed to support the thesis that gain-framed messages are more effective when promoting a prevention behavior, whereas loss-framed messages are more effective when promoting a detection behavior. Yet, even in the face of this consistent set of findings, it is important to recognize that the distinction between prevention and detection behaviors rests on the premise that people perceive engaging in detection behaviors as posing little to no risk. The function of the behavior serves as a heuristic that investigators can use to anticipate how people construe a given behavior. To the extent that there is variability in how people construe a detection or a prevention behavior, the relative influence of gain- and loss-framed appeals is more complex. We now turn to studies that have begun to delineate how people’s construal of a given behavior regulates the influences of framed appeals.

Unpacking the function of the behavior: the role of construals

Tests of the relative influence of gain- and loss-framed information have relied on the assumption that people perceive detection behaviors as risky and prevention behaviors as safe, and have treated any variability in these perceptions as error. Given that the demonstrated relationship between message frame and the function of the behavior has proven to be quite robust, it would appear that investigators have successfully targeted behaviors for which there has been considerable consensus in how they are construed. The observation that people predominantly perceive detection behaviors as posing a risk most likely reflects the fact that health professionals consistently describe the function of behaviors such as mammography as illness-detecting. Although it is possible for these behaviors to be re-framed as health-affirming behaviors—i.e., a woman could get a mammogram in order to affirm that her breasts are healthy—the tendency to construe a detection behavior in terms of its ability to detect the presence rather than the absence of a problem is consistent with the finding that people have an easier time processing and reasoning about the presence rather than the absence of features (McGuire and McGuire, 1991).

Despite the prevailing tendency to perceive detection behaviors in terms of their ability to detect a health problem, there are at least two reasons why individuals might not perceive the decision to be screened as a risky choice. First, people who consistently follow a set of effective preventive behaviors, such as brushing and flossing their teeth, might feel that there is little risk of finding a health problem and thus not be concerned about having a screening examination. Second, although the screening tests currently available are designed to test for the presence of a health problem, advances in human genetics may lead to the development of tests that can identify factors that are health promoting. Given the tendency to construe detection behaviors in terms of what they are designed to detect, people may not perceive behaviors that screen for healthy attributes as risky (i.e., one no longer runs the risk of finding something wrong). Across both of these situations, to the extent that people perceive performing a detection behavior to be a safe, health-affirming practice, a gain-framed rather than a loss-framed appeal may prove to be more persuasive.

Only a few studies have examined how people’s perceptions of a behavior moderate the influence of framed appeals, and they have all focused on
perceptions of screening behaviors. In one study, Meyerowitz et al. (1991) assessed whether women perceived performing BSE to be a risky behavior prior to providing them with either a gain- or loss-framed brochure. They found that the loss-framed brochure was more effective, but only for those women who considered performing BSE to be risky. In fact, those women who did not perceive BSE to be a risky behavior were, if anything, more responsive to the gain-framed brochure. A similar pattern of results was obtained in a study designed to promote interest in skin cancer screening examinations (Rothman et al., 1996). In this case, participants reported the likelihood that they might develop skin cancer prior to receiving either gain- or loss-framed information about skin cancer. A greater percentage of participants who received the loss-framed information was willing to schedule a screening examination (78 per cent) when compared to those who received the gain-framed information (57 per cent), but this effect was limited to people who perceived themselves to be at a relatively higher risk of developing skin cancer. People who perceived themselves to be at a relatively low risk of developing skin cancer were, if anything, more likely to schedule an examination if they had received the gain-framed as opposed to the loss-framed information (50 per cent and 44 per cent, respectively). Finally, Apanovich et al. (in press) observed that women who strongly believed that they were not currently HIV positive — and thus had little to risk by being tested — were more likely to obtain an HIV test after having viewed a gain-framed appeal, whereas those who believed they could be HIV positive were slightly more likely to get tested after viewing a loss-framed appeal.

To date, only one study has attempted to manipulate how people construe the risk implications of a single screening behavior. Kelly and Rothman (in review) examined participants’ willingness to schedule a screening examination that was presented as either a means to detect a health problem or a means to detect a health benefit. The perceived function of the screening examination was manipulated by adopting a version of the Thioamine Acetylation (TAA) paradigm (Croyle and Ditto, 1990). In this study, people were led to believe either that testing positive for TAA indicated a health benefit (i.e., it made people more resistant to a complex of pancreatic disorders) or that testing positive indicated a health problem (i.e., it made people more susceptible to a complex of pancreatic disorders). After receiving general information about TAA, participants were provided with a series of either gain- or loss-framed reasons to screen for TAA. At the close of the study, participants were provided an opportunity to schedule an appointment to be tested at the university health center. Consistent with prior research, the loss-framed pamphlet was predicted to be more effective when promoting a test designed to screen for a health problem. However, the gain-framed pamphlet was predicted to be more effective when promoting a test designed to screen for a health benefit. Among participants who reported having previously used the university health center, the effect of the message frame was shown to be contingent on the risk implications of the screening test. When TAA provided health benefits, a gain-framed pamphlet was more effective in getting people to schedule a test at the health center than was a loss-framed pamphlet (69 percent and 50 percent, respectively), but when TAA posed a health problem, participants were more likely to schedule a test when they had received a loss-rather than a gain-framed pamphlet (75 percent and 50 percent, respectively).

The results from these studies provide converging evidence that it is the risk implications of a behavior that determine what type of message frame will most effectively motivate people to take action. Throughout our research, we have operationalized ‘risk’ as the perception that a procedure affords the possibility of learning undesirable information about one’s health. The experimental design utilized by Kelly and Rothman (in review) provides an important opportunity to distinguish between this conceptualization of ‘risk’ and the objective likelihood or uncertainty of a given outcome. By systematically varying whether the test screened for a health problem or a health benefit, we were able to manipulate the risk posed by the test outcome while holding constant the uncertainty associated with it.

Although investigators have focused on differences in people’s perceptions of screening behaviors, this line of analysis should extend to prevention behaviors as well. To the extent that adopting a prevention behavior is not perceived as a safe or certain option, gain-framed appeals should become less effective. Because the safety afforded by a prevention behavior is contingent on its ability to maintain one’s health, the perceived effectiveness of the behavior may have an important influence on whether performing the behavior is considered a risky or safe proposition. Despite the fact that message frames can be used systematically to affect people’s interest in and performance of health behaviors, our understanding of the processes that mediate this effect is strikingly limited. The increased attention investigators have begun to pay to how people construe the advocated behavior may improve their ability to specify the set of thoughts and/or feelings elicited by gain- and loss-framed appeals that, in turn, guide behavioral decisions. For example, Kelly and Rothman (in review) found that participants’ feelings of concern about their health following the intervention mediated the effect that framing had on their willingness to schedule a screening test. Although this finding is consistent with the conceptual framework set forth by Rothman and Salovey (1997), additional empirical work is needed not only to replicate this finding but also to clarify more fully how gain- and loss-framed messages affect behavioral decision-making.

The dynamic relation between message frames and illness representations

The primary thesis that underlies research on message framing and health behavior is that how individuals construe a health behavior determines their response to framed appeals. Perhaps because Rothman and Salovey (1997)
emphasized the utility of distinguishing between behaviors based on their function. Investigators have treated people's representation of a behavior as a relatively stable and uniform construct. Although investigators have begun to document variability in how people construe a behavior, these efforts have been limited to cross-sectional comparisons between individuals. Little consideration has been given to how a person's representation of a behavior changes over time and how changes in construal might affect the use of message frames. In fact, the theoretical frameworks available offer little guidance regarding how message frames may be used to motivate ongoing behavioral practices. For example, what is the most effective way to promote regular screening mammography? Should women consistently receive a loss-framed appeal or should the message frame used shift in response to changes in how mammography is construed? If people's perceptions of a behavior determine their response to a framed appeal, predictions regarding the continued influence of gain- or loss-framed appeals will depend on the extent to which people's behavioral representations change over time.

We believe a more complex model of message framing is needed to specify the ongoing relationship between message frames and behavioral representations. By specifically raising this issue, we hope to encourage investigators—including ourselves—to consider and assess the effects of interventions beyond a one-time behavioral outcome. Given that the benefits afforded by most health practices require a sustained pattern of behavior, the practical value of understanding how people make decisions regarding ongoing behavioral practices is clear (for a broader analysis of this issue see Rothman, 2000).

If we hope to predict how people's representations of a health practice change, we first of all need to specify the factors that shape these representations. To date, empirical efforts have focused on documenting the consequences of people's illness representations and not the manner in which they develop (Leventhal et al., 1997; but see Leventhal et al., 1986). Consistent with broader theorizing regarding lay models of illness, how people construe a behavior is thought to be shaped in large part by how the behavior is characterized by professionals in the health care system (Cameron, 1997; Leventhal et al., 1984). To the extent that detection behaviors are consistently described in terms of their ability to detect disease, thoughts about screening behaviors may automatically elicit images of illness and feelings of distress (Millar and Millar, 1995). People's personal experience with and beliefs about the relevant health issue should also inform how they construe the behavior (Pearlman et al., 1997). For example, women may be more likely to construe screening mammography as an illness-detecting behavior if they have a family history of breast cancer and/or know other women who have been diagnosed with breast cancer. Because people's personalities shape the experiences and information they seek out, individual differences on dimensions such as dispositional optimism (Scheier and Carver, 1985), monitoring and blunting (Miller, 1995), or regulatory style (Higgins, 1998) may moderate the inferences that people draw about a behavior. Although each of the aforementioned factors is likely to be associated with people's perception of a health behavior, their personal experience with the behavior itself is likely to be the primary determinant of their construal. Direct behavioral experience has not only been shown to have a strong influence on people's attitudes (Fazio and Zanna, 1981), it is also the primary means by which people are exposed to health professionals' characterization of the behavior.

If people's perceptions of a health behavior are responsive to their behavioral experience, then the actions people take in response to a framed appeal may alter their construal of the behavior, and thus, in turn, their responsiveness to a subsequent framed appeal. To date, investigators have focused exclusively on how framed interventions affect a targeted behavior, with no attention having been paid to the elicited behavior's effect on any psychological (or behavioral) variable. In order to guide and encourage empirical work in this area, we have developed a conceptual framework that generates predictions regarding not only how people's actions shape their construal of the behavior but also how changes in construal affect the relative influence of gain- and loss-framed appeals. Because research on message framing has often focused on decisions regarding screening mammography, we have chosen to ground our theoretical discussion in this content area.

Imagine a group of women who have had a mammogram after viewing a loss-framed informational intervention. Consistent with prior research, we assume that prior to being screened they construe mammography as an illness-detecting procedure that poses some degree of psychological risk. Based on the outcome of the screening procedure, a woman typically will find herself in one of three situations: (a) the mammogram will be negative, revealing no indication of any health problem; (b) the mammogram will have raised suspicion of an abnormality that, ultimately, is determined to be a false positive; or (c) the mammogram will have detected an abnormality that, after biopsy, proves to be cancerous and requires some form of treatment. We propose that how a woman responds to each of these outcomes affects how she construes mammography and, thus, determines her response to framed appeals designed to promote further screening.

Consider first those women who receive an unambiguously clear screening. How might this experience affect their perceptions of mammography? Although investigators have spent considerable effort specifying the psychological consequences of receiving a positive or a false positive result (for a review see Lerman and Rimer, 1995), minimal consideration has been given to how women respond to the information that their breasts are healthy. We propose that women's affective and cognitive reactions to a clear screening can be used to distinguish between two broad classes of responses: one characterized by feelings of luck and the temporary relief from anxiety; and another characterized by feelings of reassurance and well-being.
The group of women who respond to the favorable news by feeling lucky and temporarily relieved are likely to interpret the screening outcome as a sign of the absence of disease. This emphasis on the absence of negative states—and the associated affective reactions it engenders—may reflect what Higgins (1998) has characterized as a prevention-focused self-regulatory style. With time, these initial feelings of relief are expected to dissipate as attention shifts from the recently completed screening to next year's procedure, eliciting new feelings of worry and concern about what might be found. For these women, the prospect of being screened remains a risky endeavor. Moreover, to the extent that they believe that the procedure inevitably will find a lump that proves to be cancerous, the experience of repeated negative screenings actually might lead the procedure to be seen as increasingly riskier—as women might infer their luck is bound to end. Given this construal of the behavior, we predict that a loss-framed appeal would consistently prove the most effective way to motivate these women to seek mammogram screening.

A second group of women is predicted to respond to a clear screening by feeling reassured by the news that they are in good health. In contrast to the first group, the reactions of these women would reflect a sensitivity to the presence of positive states, which is consistent with a promotion-focused self-regulatory style (Higgins, 1998). By conceptualizing the outcome as providing information about the presence of health rather than the absence of disease, these women may begin to modify how they have construed the screening procedure. To the extent that women begin to ascribe more favorable cognitive and affective associations to the process of screening mammography, the procedure may be seen as less of a risky endeavor and, in fact, over time it may be construed as an opportunity to affirm that one's breasts are healthy. At the point at which these women no longer construe mammography as an illness-detecting—or risky—behavior, the continued application of loss-framed appeals will prove ineffective. At this time, a shift to a gain-framed appeal would be predicted to be a more persuasive communication strategy.

Given that screening behaviors are consistently characterized in terms of their ability to detect disease, we would anticipate that the majority of women, at least initially, respond to a clear screening with feelings of relief and a reduction in concern. What remains to be determined are the factors that predispose women to reconceptualize the screening result as a reassuring and health-affirming outcome. We believe that some preliminary answers can be gleaned from research regarding predictors of elevated levels of concern and anxiety about breast cancer. Factors shown to predict feelings of concern about breast cancer—such as a family history of breast cancer and knowing women with breast cancer—are likely to decrease the chances that a woman would feel reassured following a clear screening. Although any transformation in how the screening procedure is construed should become more pronounced as the number of consecutive clear screenings increase, the rate at which perceptions of the behavior changes is likely to vary as a function of the characteristics listed above.

Taken together, the specifications of these two groups of women suggest that predictions regarding the relative impact of gain- and loss-framed appeals depend on how women respond to the behavioral outcome. Moreover, this perspective predicts that the number of women who respond more favorably to a gain-framed appeal about a screening behavior increases over time. How do these predictions fit with the consistent finding that loss-framed appeals are the most effective way to promote the use of screening mammography? It is possible that because prior intervention studies (Banks et al., 1995; Schneider et al., 2001) recruited only women who were not complying with prevailing screening guidelines, they may have unintentionally oversampled women who were less likely to have had a repeated series of clear mammograms and, thus, were more likely to perceive the behavior as a risky course of action. Consistent with this premise, women who use mammography irregularly (i.e., less than every two years) have been shown to have strikingly more negative attitudes toward the behavior than women who get screened every one or two years (Rakowski et al., 1997). However, the attitudinal measure used in this study did not specifically assess perceptions of the risk posed by the procedure.

We anticipate that the conceptual framework outlined with respect to how women may respond to a clear screening result can also be applied to women who have had to cope with an initially suspicious mammography finding as well as those who have completed treatment for breast cancer and have begun to monitor for a recurrence of cancer. Because researchers have consistently found that receiving an initially suspicious mammogram elicits elevated feelings of concern about the screening procedure (e.g., Lerman et al., 1991), one might predict a loss-framed appeal would be the most effective way to encourage these women to return for a subsequent mammogram. However, any factors that elicit variability in how women respond to the initial screening outcome should affect the relative influence of gain- and loss-framed appeals. This might explain why an earlier study failed to obtain a message-framing effect on the screening behaviors of women who recently had a suspicious mammogram (Lerman et al., 1992). In the case of women who have started to screen again following treatment, how they construe the screening procedure may depend on their response to the treatment. We expect that those women who complete treatment feeling confident and reassured about their health would be more likely to construe the test as a health-affirming procedure and, thus, be more responsive to a gain-framed appeal, whereas those who complete treatment anxious about the possibility of a relapse would be more likely to construe the test as an illness-detecting procedure and, thus, be more responsive to a loss-framed appeal.

As indicated at the outset of this section, our predictions regarding the interplay between framing and changes in how a behavior is construed remain untested. They require investigators not only to monitor a pattern of behavioral outcomes over time but also to track how people's actions affect
their representation of the behavior. The framework we have outlined provides a clear set of testable predictions regarding how the repeated application of gain- and loss-framed messages can be used to motivate people to maintain a healthy pattern of behavior. In stating that message frames need to match people's perceptions of the behavior, our approach provides a theoretically grounded way to tailor an intervention to characteristics of the target audience (Kreuter et al., 1999). Although investigators have begun to entertain questions regarding the decision processes that discriminate between consistent and inconsistent behavioral practices (e.g., Sheeran et al., 2001), a new generation of intervention studies needs to be designed and implemented that afford repeated intervention contacts and that allow for the inclusion of framed appeals that can be matched or mismatched to an individual's representation of the behavior.

Final observations

Research on message framing has provided a theoretically grounded approach to health communication and health decision-making. Yet it should be clear that framing in and of itself is not a 'magic bullet,' such that an emphasis on gains or losses always leads to an increase in healthy behavioral practices. Rather, the effectiveness of a framed message is moderated by characteristics of the message recipient, characteristics of the desired behavior, or both. It is the further elucidation of these moderators as well as the psychological mediators that underlie framing effects that represents the research agenda of the coming decade.

Notes

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2 A further distinction can be made within the classes of gain- and loss-framed appeals. Gain-framed messages can emphasize obtaining positive outcomes or avoiding negative outcomes, whereas loss-framed messages can emphasize obtaining negative outcomes or avoiding positive outcomes. To date, investigators have found consistent effects across the two different operationalizations (Detweiler et al., 1999).

3 Although this operationalization of risk would seem to be less precise than one grounded on the probability of a given outcome, it has become increasingly clearer that people's responses to the stated probability of an outcome depend on the subjective meaning assigned to the potential outcome (Rothman and Kiviniemi, 1999). Moreover, this emphasis allows one to disentangle the objective benefits afforded by a behavior from how people construe the behavior.

4 Loss-framed information about a blood cholesterol test was effective only when college undergraduates were informed that coronary heart disease was a problem for people under 25 years old (for a broader analysis of this finding see Rothman and Salovey, 1997).

References


Kelly, K.M. and Rothman, A.J. (in review) 'Screening for health and illness: an analysis of how and when message frames impact behavioral decision-making.'


Rothman, A.J., Martin, S.C. and Jeffery, R. (2000) 'Predicting preferences for certain or uncertain options: the importance of knowing whether an outcome is construed as a gain or a loss,' unpublished manuscript, University of Minnesota.


