

Message Framing in the Prevention and Early Detection of Illness

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The effectiveness of interventions designed to promote healthy behaviors often depends on the persuasiveness of a public service announcement (PSA), a brochure, a print advertisement, a government letter, an educational program, or a communication from a health professional. From a psychological vantage point, these communications represent persuasion opportunities in which to apply a technology derived from nearly a half century of research on attitude change. Psychological research on attitude change has focused primarily on one of three aspects of persuasive communication (Eagly & Chaiken, 1993; Hovland, Janis, & Kelley, 1953; McGuire, 1985). These are (a) the source of the persuasive message (e.g., the communicator's expertise, credibility, trustworthiness, attractive-

ness, and similarity to the recipient), (b) the recipient of the message (e.g., his or her knowledge about the attitude domain, experience with the attitude object, and demographic and dispositional characteristics expected to be associated with influenceability), and (c) aspects of the message itself.

Of these three areas of research activity, message variables have been studied the least systematically, although interesting findings have emerged (reviewed by Eagly & Chaiken, 1998; McGuire, 1985; Petty & Wegener, 1998). For example, anecdotes about particular people are more persuasive than the presentation of cold statistics (Hamill, Wilson, & Nisbett, 1980; Taylor & Thompson, 1982). Fear-arousing appeals are usually effective only when instructions about how to reduce

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the fear are included in the message (Janis, 1967; Leventhal, Singer, & Jones, 1965; Sutton, 1982). Messages encouraging personal responsibility can be more motivating than those that attribute responsibility to others (Rothman, Salovey, Turvey, & Fishkin, 1993). Forcefully delivered messages are more persuasive than subtle ones (Robinson & McArthur, 1982), and messages delivered quickly (even if by fast-talking salespeople) are surprisingly more effective than leisurely delivered messages (Miller, Maruyama, Beaber, & Valone, 1976).

An aspect of messages that has been studied quite systematically in the context of health and illness is framing. *Message framing* refers specifically to the emphasis in the message on the positive or negative consequences of adopting or failing to adopt a particular health-relevant behavior (Rothman & Salovey, 1997). *Gain-framed* messages usually present the benefits that are accrued through adopting the behavior (e.g., "Obtaining a mammogram allows tumors to be detected early; this maximizes your treatment options"). *Loss-framed* messages generally convey the costs of not adopting the requested behavior (e.g., "If you do not obtain a mammogram, tumors cannot be detected early; this minimizes your treatment options"). Although these two kinds of messages convey essentially the same information, one of these kinds of messages may be much more persuasive than the other.

PROSPECT THEORY AND THE FRAMING HYPOTHESIS

Prospect theory provides the context for understanding the psychological processes involved in the influence of framed persuasive messages on health behaviors. Prospect theory was proposed to understand decision making under conditions of uncertainty

(Kahneman & Tversky, 1979, 1982; Tversky & Kahneman, 1981). The framing postulate suggests that decision makers organize information in memory relevant to such decisions in terms of potential gains (i.e., benefits) or potential losses (i.e., costs) as compared to a current reference point (e.g., one's current level of health). Factually equivalent material can be presented differentially to individuals such that they encode it as either a gain or a loss from this reference point.

In an often-cited study, for example, Tversky and Kahneman (1981) presented individuals with a situation in which the outbreak of a disease is expected to kill 600 people. In one comparison, participants were presented with gain-framed information. They had to decide whether to endorse a program guaranteeing that 200 of the original 600 people would be *saved* or one claiming that there was a .33 probability that all 600 would be saved but also a .67 probability that no one would be saved. Note that although the "expected value" of the two programs was identical, the first option emphasized a *certain* outcome, but the second emphasized a *probabilistic* or *risky* outcome. Participants presented with these choices overwhelmingly selected the first option, the certain outcome, in which 200 people were guaranteed to be saved.

A second group of participants was presented with the same two options. However, this time, the potential losses were emphasized. In this comparison, participants had to choose between a first program in which 400 of the original 600 people would certainly *die* and one in which there was the same .33 probability that no one would die and a .67 probability that all would die. Once again, the expected value of these two options was identical. Furthermore, these two options differ from the two previous options only in that they make salient the potential costs or losses (i.e., deaths) as compared to the options that

made salient potential benefits or gains (i.e., lives saved). In the loss salient situation, participants overwhelmingly chose the second option, in which there was a .67 probability that everyone would die. When losses are anticipated, people no longer prefer the option that is a sure bet. Rather, they choose the option that involves some uncertainty or risk.

The value function of prospect theory summarizes these decision strategies by noting that individuals are, in general, *risk seeking* in the domain of losses but *risk averse* in the domain of gains. The value function assumes that an S-shaped function relates outcomes to their subjective values and that the function is concave for gains and convex for losses and steeper in the loss domain. This function suggests that when behavioral choices involve some risk or uncertainty, individuals will be more likely to take these risks when information is framed in terms of the relative disadvantages (i.e., losses or costs) of the behavioral options. At the same time, conservative or risk-averse options are preferred when gains are made salient.

Loss-framed persuasive messages encourage people to consider the negative consequences of their choices. The associated subjective unpleasantness motivates a kind of loss aversion, and according to prospect theory, people are subsequently more likely to engage in a risky behavior (i.e., a behavior with an uncertain outcome) if there is a possibility of avoiding the loss. By contrast, exposure to gain-framed messages may cause people to feel less endangered, making them less likely to perform a behavior with uncertain outcomes. After processing gain-framed information, individuals may feel relatively satisfied with the outcomes of their choices and become risk averse; they do not want to do anything to jeopardize these gains.

Prior to our research program in this area, these principles had been applied to per-

suading women to use monthly breast self-examination (BSE) (Meyerowitz & Chaiken, 1987). Women were asked to read one of two pamphlets describing BSE. The first emphasized the potential benefits of BSE, and the second emphasized the potential risks of not performing BSE. This latter, loss-framed pamphlet was more effective in promoting BSE than was the gain-framed pamphlet. The particular effectiveness of loss-framed messages in encouraging BSE makes sense in terms of prospect theory. BSE is perceived as a psychologically risky or uncertain behavior. It is not done to *prevent* cancer; rather, it is performed to *detect* cancer. Each time a woman performs BSE, she runs the risk of finding an abnormality.

Although Meyerowitz and Chaiken (1987) showed that loss-framed messages are especially effective in motivating women to perform BSE, the literature on framing and health promotion actually has yielded a more interesting pattern of results (reviewed by Rothman & Salovey, 1997; Wilson, Purdon, & Wallston, 1988). For example, while loss framing has been effective for promoting HIV screening (Kalichman & Coley, 1995) and mammography use (Banks et al., 1995; Schneider, Salovey, Apanovitch, et al., 2001), gain-framed messages have encouraged preferences for some surgical procedures (Levin, Schnittjer, & Thee, 1988, Experiment 2; Marteau, 1989; McNeil, Pauker, Sox, & Tversky, 1982; Wilson, Kaplan, & Schneiderman, 1987), the use of infant car restraints (Christophersen & Gyulay, 1981; Treiber, 1986), regular physical exercise (Robberson & Rogers, 1988), smoking cessation (Schneider, Salovey, Pallonen, et al., 2001), and using sunscreen to prevent skin cancer (Detweiler, Bedell, Salovey, Pronin, & Rothman, 1999; Rothman, Salovey, Antone, Keough, & Martin, 1993). Thus, it is not that either gain-framed messages or loss-framed messages are always more persuasive for all

health behaviors; rather, it seems to depend on the type of behavior targeted for change.

Framing and the Prevention-Detection Distinction

Considering the type of behavior being promoted helps to clarify the influence of message framing on health behavior. In the research described previously, loss-framed messages were effective in promoting mammography, BSE, and HIV testing—all early detection (screening) behaviors. Conversely, gain-framed messages were effective in promoting infant car restraints, physical exercise, smoking cessation, and sunscreen—all prevention behaviors. The perceived uncertainty or risk (e.g., of finding an abnormality) associated with detection behaviors leads us to predict that loss-framed messages should be more persuasive in promoting them. However, prevention behaviors might not be perceived as risky at all; they are performed to deter the onset or occurrence of a health problem. Thus, choosing to perform prevention behaviors is a risk-averse option; it maintains good health. Because risk-averse options are preferred when people are considering benefits or gains, gain-framed messages may be more likely to facilitate performing prevention behaviors. We emphasize, in line with the framing postulate of prospect theory, that generally it is the *match* between a message frame (gain or loss) and the required health behavior (prevention or detection) that especially motivates behavior change (Rothman & Salovey, 1997).

These findings motivate the main hypothesis guiding our program of research:

Gain-framed messages are more persuasive when promoting prevention behaviors, but loss-framed messages are more persuasive when promoting early detection (screening) behaviors.

Types of Framing

Another reason why investigators have not always reported consistent message framing effects in studies of persuasion concerns differences in the operationalization of framing (Fagley, 1993). There are two different ways in which gain and loss frames can be instantiated (Brendl, Higgins, & Lemm, 1995; Petty & Wegener, 1991). Gain-framed messages can focus on attaining a desirable outcome or on not attaining (avoiding) an undesirable outcome—both beneficial. For example, compare the message “If you decide to get HIV tested, you may feel the peace of mind that comes with knowing about your health” to “If you decide to get HIV tested, you may feel less anxious because you won’t wonder whether you are ill.” On the other hand, loss-framed messages can emphasize attaining an undesirable outcome or not attaining a desirable outcome—both costly. For example, compare “If you decide not to get HIV tested, you may feel more anxious because you may wonder whether you are ill” to “If you decide not to get tested, you won’t feel the peace of mind that comes with knowing about your health.”

In Figure 20.1, note that gain-framed messages can describe the benefits of attaining a desirable outcome (Cell A) or avoiding an undesirable one (Cell D). Loss-framed messages describe the risks of failing to attain a desirable outcome (Cell C) or attaining an undesirable one (Cell B). In our early experiments, comparisons between gain- and loss-framed messages focused primarily on Cells A and C. Other investigators have operationalized framing as the difference between Cells A and B. And little attention has been paid to messages of the form defined by Cell D. These differences in operationalizing framing may help to explain the findings in the literature on performing health behaviors described earlier (Rothman & Salovey, 1997). Loss-framed

		Outcome Value	
		Desirable	Undesirable
Action	Attain	Cell A (Gain)	Cell B (Loss)
	Not Attain	Cell C (Loss)	Cell D (Gain)

Figure 20.1. Four Kinds of Framing

messages that facilitated mammography and BSE involved comparing Cells A and C (Banks et al., 1995; Meyerowitz & Chaiken, 1987), but gain-framed messages that facilitated preferences for surgical procedures (Levin et al., 1988; Marteau, 1989; McNeil et al., 1982; Wilson et al., 1987) used a manipulation emphasizing either the positive or negative consequences of surgery (Cell A vs. Cell B). Attending to messages defined by all four cells allows us to explore whether the differential effects of framed messages are invariant across the desirability of the outcomes or whether outcome desirability moderates framing effects.

A DECADE OF EXPERIMENTS FROM FIELD AND LABORATORY SETTINGS

We have conducted research on the framing of persuasive messages to encourage prevention and early detection activities for more than 10 years. In this section, we summarize our findings to date. Experiments are not described chronologically but rather are grouped according to the behavior targeted for change and the hypotheses addressed.

Gain- and Loss-Framed Messages and Mammography

Experiment 1 was a framed mammography intervention conducted with women at a local telephone company, Experiment 2 tested this intervention with a very heterogeneous sample of women from community groups and churches, and Experiment 3 looked at both framing and targeting to ethnicity among African American, Latina, and White women recruited at community-based health clinics. All three of these experiments examined the effectiveness of gain- versus loss-framed messages in motivating women to obtain mammograms.

Experiment 1. Participants in Experiment 1 were 133 women over 40 years of age working at a telephone company, recruited because they had previously obtained fewer than 50% of the mammograms expected for someone their age. About 20% were minority group members. The protocol included random assignment to a videotaped educational program, a pre-intervention packet of measures, a post-intervention packet of measures, and follow-up for mammogram use 6 and 12 months

after watching the videotape. We worked with the telephone company's television production team to create professional-looking videotaped educational programs on breast cancer and the value of screening mammography. One video presented all information about the value of screening mammography in gain-framed terms (e.g., "We will show that detecting breast cancer early can save your life. . . . The bottom line is—when you get regular mammograms, you are doing your best to detect breast cancer in its early stages"), and the second presented all information in loss-framed terms (e.g., "We will show that failing to detect breast cancer early can cost you your life. . . . The bottom line is—when you fail to get regular mammograms, you are not doing your best to detect breast cancer in its early stages"). The actual information conveyed about breast cancer and mammography was identical in both videos.

After viewing one of the 15-minute videos, women received a pamphlet about where to get a mammogram. Women were contacted by telephone 6 and 12 months later to determine whether they had obtained a mammogram since viewing the video. (Self-reports of mammography use are considered quite reliable [King, Rimer, Trock, Balshem, & Engstrom, 1990].) We predicted that information framed in terms of losses would be more persuasive than information framed in terms of gains because mammography is an early detection (screening) behavior. In fact, 12 months after the intervention, mammography use was 66.2% in the loss condition as compared to 51.5% in the gain condition (Banks et al., 1995).

Experiment 2. Because the regular use of mammography is lower among working-class women than among middle-class women, the same experimental conditions as in Experiment 1 were repeated with a low-income sample of women recruited from community so-

cial groups and churches. Differently framed videotapes and brochures, followed by a discussion session with a health educator, were presented at regular meetings of these groups. The 118 women in this sample had significantly lower family incomes, regardless of ethnicity, than those in Experiment 1. Of these women, 59% were White and 41% were African American or Latina. As in Experiment 1, women over 40 years of age who had previously obtained fewer than 50% of the mammograms expected for someone of their age were recruited for this study. The protocol for this experiment was much like that for Experiment 1.

Experiment 2 produced framing effects in the predicted direction—loss-framed videos worked better than gain-framed videos—but they were not quite statistically significant. Among African American and Latina women, 52% of those who viewed the loss-framed message subsequently obtained a mammogram in the following year, whereas only 43% of those who viewed a gain-framed message did likewise, as predicted. Among the White women, 78% who saw the loss-framed message obtained a mammogram as compared to 70% of those in the gain-framed condition (Salovey et al., 1994).

Experiment 3. We recently completed a much larger scale experiment in which African American, Latina, and White women viewed gain- or loss-framed videotapes (in English or Spanish) about mammography that also were either targeted to members of the women's ethnic group or were multicultural. The targeted messages included statistical information relevant to African American, Latina, or White women and models of similar ethnicities as well as familiar images of relevant places in the community. The multicultural messages presented information relevant to all women. The design of the experiment was a 2 (Framing) \times 2 (Ethnic Targeting) factorial

(when collapsed over ethnic group), and measures of attitudes and mammography-relevant behavior were administered prior to the video, immediately after the video, 6 months later, and 12 months later.

A total of 752 women were recruited into this experiment. Of these, 42% were African American, 25% Hispanic, 27% White, 1% Asian, and 2% American Indian or Alaskan Native. Six months after viewing the video, 43% of the women who saw a loss-framed version had obtained a mammogram, while 38% of those who saw a gain-framed version had done so. However, an interesting interaction between framing and targeting emerged in which the most persuasive messages in motivating mammography were those that were loss framed *and* multicultural. There was a large, significant, loss-framed advantage among the multicultural messages (50% for loss-framed videos and 36% for gain-framed videos). Among the targeted messages, the difference due to framing was not significant (36% vs. 41%). These findings were maintained after 12 months, although they were somewhat attenuated. There was a loss-framed advantage among the multicultural messages (61% for loss-framed videos vs. 55% for gain-framed videos), but for the targeted messages the differences due to framing were not significant (54% vs. 57%). In general, framing effects were stronger for Latina and White women than for African American women both 6 and 12 months following the presentation of the video (Schneider, Salovey, Apanovitch, et al., 2001).

Gain- and Loss-Framed Messages and Skin Cancer Prevention and Early Detection

Because Experiments 1 to 3 were focused on mammography, a screening behavior, we could not test whether gain-framed messages

might have persuaded women to engage in a preventive health behavior. Experiments 4 to 6 were designed to address this question. Experiment 7 primarily focused on skin cancer-related detection behaviors, and Experiment 8 tested whether the advantages of message framing could be demonstrated using very brief interventions conducted on a public beach.

Experiment 4. This experiment was designed to explore the part of our hypothesis that suggests that messages framed in terms of gains are more effective in promoting prevention behaviors. We can begin to assess this hypothesis by comparing the results of Experiment 4, in which the targeted behavior was sunscreen use (a prevention behavior), to the results of Experiments 1 to 3, in which the targeted behavior was mammography (a detection behavior). Recall that in Experiments 1 to 3, mammography use was facilitated by loss-framed messages. In Experiment 4, we predicted that sunscreen use would be facilitated by a gain-framed message.

A total of 146 young adults recruited from a college community were asked to read gain- or loss-framed pamphlets about skin cancer and its prevention. They then completed various psychological measures. At the end of the experiment, participants were given a pre-addressed and stamped postcard that they could mail to our laboratory to receive a free bottle of sunscreen. On the postcard, they were asked to choose the level of sun protection factor (SPF) they desired. Our hypothesis was that the participants exposed to gain-framed messages would be more likely to request sunscreen with an appropriate SPF (≥ 15), as encouraged by the pamphlets, than would those exposed to loss-framed messages.

The gain- and loss-framed pamphlets were designed to differ only in how the information was presented. Each pamphlet contained information concerning the incidence and etiol-

ogy of skin cancer as well as how to prevent and detect the disease. The gain-framed pamphlet described the statistics, facts, and arguments by emphasizing benefits rather than risks and focusing on the positive aspects of being concerned about skin cancer (e.g., "Regular use of sunscreen products can protect you against the sun's harmful rays"). The loss-framed pamphlet described the same information but emphasized risks rather than benefits and especially focused on the risks of not performing cancer-related behaviors (e.g., "If you don't use sunscreen products regularly, you won't be protected against the sun's harmful rays").

Participants' knowledge about skin cancer was not affected differently by the two pamphlets. However, the loss-framed pamphlet resulted in higher estimates of one's perceived risk of contracting skin cancer and in more intense negative feelings after reading it. But it was the gain-framed pamphlet that was more likely to motivate cancer prevention behavior. Fully 71% of the participants who read the gain-framed pamphlet requested a sample of sunscreen with an SPF greater than or equal to 15, but only 46% of the participants who read the loss-framed pamphlet requested sunscreen with this recommended level of SPF. Although both women and men were more likely to request appropriate sunscreen if they had read the gain-framed pamphlet, this advantage for the gain-framed pamphlet was statistically significant for women but not for men. Women indicated that they were more invested (i.e., more highly involved) with the attitude object (i.e., skin cancer) than were men. Thus, exposure to a gain-framed message motivated a cancer prevention behavior, and this advantage was especially salient among more invested individuals for whom the disease was a more relevant concern (Rothman, Salovey, Antone, et al., 1993; but see Maheswaran & Meyers-Levy, 1990).

Experiment 5. This experiment was designed to explore further the role of involvement with the attitude object in determining the relative effectiveness of gain- versus loss-framed messages. In this experiment, we expected high-involvement participants to be more sensitive to framing than were low-involvement participants. A total of 525 young adults, recruited on campus and about equally divided by gender, read gain- or loss-framed pamphlets similar to those used in Experiment 4 about skin cancer and its prevention. We hypothesized that sex is associated with issue involvement, so we measured involvement more fully. In fact, as compared to men, women spent more time actively trying to tan, were indeed significantly more concerned about developing skin cancer, felt that skin cancer was a more serious health problem, and thought that developing a sunburn was more dangerous. Thus, in this experiment we allowed sex to serve as a proxy for involvement.

We asked participants to indicate their intention to perform skin cancer *prevention* behaviors, such as using sunscreen, and skin cancer *detection* behaviors, such as skin self-examinations and clinical skin examinations. Overall, as compared to men, women expressed greater intentions to perform detection behaviors related to skin cancer. However, this sex difference was qualified by a significant framing by participant sex interaction. As expected, women who read loss-framed information about skin cancer expressed greater intentions to perform skin cancer-related detection behaviors than did women who read gain-framed information. Conversely and unexpectedly, men who read gain-framed information about skin cancer expressed greater intentions to perform detection behaviors than did men who read loss-framed information. It appears that the loss frame/detection behavior principle holds more strongly for individuals invested in the

attitude object (in this case, women) than for those who are less so (in this case, men) (Rothman, Salovey, Antone, et al., 1993).

Experiment 6. Given the more complex results of Experiment 5, Experiment 6 attempted to shore up support for the hypothesis that gain framing is most effective in promoting prevention behaviors and that loss framing is most effective in promoting detection behaviors relevant to skin cancer. This experiment promoted sunscreen use and attendance at a skin cancer screening clinic through differently framed videos modeled after the ones used in the mammography studies. A total of 453 young adults were assigned to view gain- and loss-framed videotapes that described the importance of sunscreen use and clinical skin examinations. The primary outcome variables were requests for sunscreen and intentions to attend a skin screening 1 month and 10 months after the intervention. As predicted, students who viewed the loss-framed messages expressed stronger intentions to obtain a clinical skin examination and to perform self-skin examinations (detection behaviors) than did those who viewed the gain-framed messages. Likewise, as predicted, students who viewed gain-framed messages requested higher levels of SPF sunscreen (a prevention behavior) than did those who viewed loss-framed messages. This interaction between framing and behavior type provides further support for the primary message framing hypothesis (Salovey, Pronin, Rothman, Zullo, & Leffell, 2001).

Experiment 7. This experiment involved the promotion of actual attendance at a skin cancer early detection screening program provided in a corporate health setting. We recruited individuals from workplaces and advertised a skin screening to be conducted later at the same site. Participants viewed either

gain- or loss-framed videotapes promoting clinical skin examination. We recruited 256 assembly line workers from a manufacturing company, managers and scientists from a pharmaceutical laboratory, and retirees and their spouses from a diversified electronics company. The protocol included random assignment to a gain- or loss-framed videotaped educational program, pre- and post-video questionnaires, and follow-up for clinic attendance 1 and 6 months after the intervention.

In Experiment 7, the loss-framed program produced greater perceptions of personal risk for skin cancer, produced more personal concern about skin cancer, and was accompanied by less sanguine emotional reactions as compared to the gain-framed program. As predicted, at all three companies, intentions to obtain the clinical skin screening were higher among the viewers of the loss-framed messages. Viewing the gain-framed video elicited more agreement with pro-prevention attitude scales (Salovey & Pronin, 1995).

Experiment 8. In general, the experiments reviewed thus far suggest that gain-framed messages should be more effective in promoting cancer prevention behaviors but that loss-framed messages should be more effective in promoting cancer early detection behaviors. These studies have always manipulated framing in terms of desirable outcomes, emphasizing either their attainment (gain frame) or the failure to attain them (loss frame). However, framed messages can emphasize desirable or undesirable outcomes (Rothman & Salovey, 1997). Gain-framed messages can focus on the attainment of a desirable outcome or the avoidance of an undesirable outcome, both of which are beneficial. Loss-framed messages can emphasize the attainment of an undesirable outcome or the failure to attain a desirable outcome, both of which are costly. The primary hypothesis here was that the advantage for gain-framed messages in promoting

prevention would be especially strong when such messages focus on desirable outcomes (e.g., "People who use sunscreen regularly have healthier looking skin when they grow older") but that loss-framed messages should be especially powerful when emphasizing the likelihood of experiencing undesirable outcomes (e.g., "People who don't use sunscreen regularly have unhealthy looking skin when they grow older").

Experiment 8 was a test of this hypothesis using a 2×2 randomized design in which two types of gain-framed messages (attaining desirable and avoiding undesirable) were contrasted with two types of loss-framed messages (attaining undesirable and avoiding desirable). With the permission of the State Parks Division of the Connecticut Environmental Protection Department, we recruited 217 individuals over 18 years of age sunbathing on a public beach. They randomly received one of the four brochures about skin cancer and sunscreen use. Of the participants in the two gain-framed conditions, 73% requested a bottle of sunscreen from our "supplier" at the beach, but only 53% of the loss-framed participants made a similar request, consistent with our basic gain prevention/loss detection hypothesis. As it turned out, both kinds of gain framing were equally effective; likewise, both types of loss framing were equally less effective—at least for sunscreen use (Detweiler et al., 1999).

Generalizing Framing Effects

Experiment 9: Regulatory Focus and Message Framing. Given the success of Experiment 8, in which sunscreen use by beachgoers was promoted better by gain-framed messages than by loss-framed messages, we conducted another beach experiment to pilot test whether psychological characteristics of individuals might make them more susceptible to certain

framed messages. Higgins (1997, 1998; see also Crowe & Higgins, 1997; Shah, Higgins, & Friedman, 1998) has suggested that individuals tend to be guided by two general motives: safety (the avoidance of negative outcomes) and nurturance (the attainment of positive outcomes). He has found that individuals differ in the relative weights of these two motives in their lives, with some individuals working strenuously to feel safe and secure while others strive just as hard to feel accomplished and fulfilled. He has referred to this personality variable as *regulatory focus* and called this first group of people *prevention focused* and the second group *promotion focused*. Based on his laboratory work, we predicted that prevention-focused individuals might be more persuaded to use sunscreen by messages emphasizing negative consequences that could be avoided (e.g., melanoma) and that promotion-focused individuals might be more persuaded by messages emphasizing positive consequences that could be attained (e.g., living a full healthy life). As in Experiment 8, 437 individuals over 18 years of age were recruited on public beaches in Connecticut. They were given Harlow, Friedman, Higgins, Taylor, and Shah's (2001) measure of prevention versus promotion focus (the Regulatory Focus Questionnaire) and assigned to one of the same four message-framing conditions. We are currently analyzing these data, but it appears that prevention-focused individuals are more likely to be motivated to take action by any message that emphasizes undesirable outcomes and that promotion-focused individuals are more likely to be persuaded by messages that emphasize desirable outcomes. We are not certain, however, whether these trends are statistically significant.

Experiment 10: Regulatory Focus, Message Framing, and HIV Testing. This experiment investigated the effectiveness of differently framed messages designed to encourage low-

income women to obtain an HIV test. We examined the influence of systematically different educational videos that were either gain or loss framed, emphasizing either the benefits of being screened for HIV or the costs of not being screened.

A total of 352 women completed a baseline interview that included the Regulatory Focus Questionnaire measuring promotion and prevention orientations. They were then randomly assigned to watch one of four framed videos aimed at persuading women to get an HIV test. HIV testing was assessed 9 months following baseline. Overall, 40% of the women who completed follow-up obtained an HIV test within 9 months. Promotion-focused women who viewed gain-framed messages were more likely to report getting an HIV test (50%) than were promotion-focused women who viewed a loss-framed message (23%). Among prevention-focused women, 42% who saw a gain-framed video and 36% who saw a loss-framed video obtained an HIV test, a difference that is not statistically reliable.

That gain-framed messages generally were more effective than the loss-framed messages in this domain, even though we consider HIV testing an early detection behavior, may at first seem puzzling. However, many of the women in this experiment indicated that the reason they would obtain an HIV test is to prevent the spread of HIV to partners rather than, necessarily, to detect illness in themselves. Recently, we completed a follow-up study to examine whether this difference in the way HIV testing is construed—as primarily serving a preventive rather than a detection function—accounts for our findings, and it seems likely that it does (Apanovitch, McCarthy, & Salovey, 2002). Meanwhile, it appears that differences in HIV testing decision making may also be a function of both the way a message is framed and the individual's regulatory focus. Stressing the benefits of HIV testing seems to increase testing behavior among

women who are more oriented toward seeking desirable outcomes in life rather than toward avoiding undesirable ones.

Experiment 11: Gain- and Loss-Framed Smoking Cessation Messages. In collaboration with the University of Rhode Island Cancer Center, we have conducted an experiment concerning smoking cessation among older adolescents. They viewed framed videotaped messages in which the textual elements were written in gain or loss terms and varied independently of the visual elements, which also were gain or loss framed. A total of 437 individuals participated in this experiment. If smoking cessation is viewed as a cancer prevention behavior, then consistent with the first hypothesis described earlier in this chapter, gain-framed messages should be more effective in encouraging this behavior. In fact, messages in which the text and visuals were gain framed were most effective. For smokers, any type of gain frame—visual or auditory—decreased temptations to smoke and actual number of cigarettes consumed (Schneider, Salovey, Pallonen, et al., 2001).

Experiment 12: The Same Behavior Framed in Gain or Loss Terms. We created four different professional-quality 15-minute videos about the value of pap testing. These videos placed pap testing in a preventive or early detection context and then framed this information in gain or loss terms. We expected gain-framed messages to be most effective in the prevention context and loss-framed messages to be most effective in the early detection context. We have recruited 512 women from community health clinics and randomly assigned them to view one of these four videos. Behavioral follow-ups are now being conducted, and we hope to be able to report on findings from this experiment quite soon. Recent findings from a laboratory analog exper-

riment in which a mouthwash was described as either plaque preventing or plaque detecting lead us to suspect that we will obtain the predicted function by framing interaction (Rothman, Martino, Bedell, Detweiler, & Salovey, 1999).

MECHANISM

Behavioral decision theories, such as prospect theory, are rather silent with respect to the psychological mediation of framing effects. Most investigators working in this tradition have turned to shifts in the reference (inflection) point in the value function or changes in beliefs about the probability of pleasant and unpleasant outcomes as possible mechanisms. During recent years, we have focused on a more emotionally charged potential mediator of framing effects, anticipated affect, by which we mean the feelings a person simulates when considering performing (or being blocked from performing) the target behavior. We believe that framed messages motivate an individual to consider the affective consequences of initiating (or being prevented from initiating) a health behavior and that it is this anticipated affect that motivates salubrious action.

Our work on anticipated affect as the mediator of framing effects, however, is in its infancy. There are data that suggest that, at the very least, we may be on the right path. First, gain- and loss-framed messages can arouse different feelings; gain frames can lead to feelings of reassurance, but loss frames can generate anxiety (e.g., Rothman, Salovey, Antone, et al., 1993). Second, we conducted an experiment in which hypothetical prevention and early detection programs were described for addressing a fictitious disease called the "letrolisus virus." Participants were much more motivated to perform the prevention behavior after reading a gain-framed persua-

sive message and more likely to want to perform the detection behavior after reading a loss-framed message (Rothman et al., 1999; see also Detweiler et al., 1999). Moreover, the negative affect that participants expected to experience if not allowed to engage in these behaviors was greater after reading the more persuasive brochure. Finally, Wegener, Petty, and Klein (1994) showed that participants who have been induced to feel happy moods are more persuaded by gain-framed information, while those who have been induced to feel sad moods are more persuaded by loss-framed information. Although empirical support remains rather meager at present, we suggest that to understand framing, we will need a better handle on the emotions evoked by framed messages.

One additional issue that will need to be addressed by future researchers working on framing and health behavior is an elucidation of the meaning of our framing by behavior-type interactions. We are fairly certain that our "gain for prevention" and "loss for early detection" findings actually represent specific instances of more general principles. We have suggested that prevention and early detection behaviors differ in the uncertainty or risk involved in initiating them. But it is entirely possible that some other difference is what renders these behavior types as more or less influenced by gain versus loss framing. Even more fascinating is that some individuals (e.g., some of the women in our HIV testing experiment) appear to view testing as more of a prevention than a detection behavior. This finding suggests that a person's individualized construal of the function of a health behavior may be more important in predicting framing effects than is the "objective" function of that behavior (Apanovitch et al., 2002). Future work focused on persuading individuals to engage in healthy behaviors will need to address the interplay of objective and subjective functions of desired behaviors.

IMPLICATIONS

Interventions to encourage behaviors that can prevent or detect illness at an earlier, more treatable stage generally include the presentation of information in a didactic or persuasive context. Health communication experts can be given empirically based guidelines to optimize these messages. For example, the persuasiveness of information presented in terms of the benefits that might be associated with adopting a behavior versus the costs of not adopting it may depend on the type of health behavior one aims to encourage. The value function of prospect theory suggests hypotheses concerning the conditions under which such gain- or loss-framed messages are more or less effective.

Across a series of laboratory and field experiments concerning behaviors relevant to several illnesses, we have found that gain-framed messages generally are more persuasive when the target behavior serves to prevent illness but that loss-framed messages are more persuasive when the target behavior serves a screening or early detection function. These findings are consistent with the value function of prospect theory suggesting that gain-framed information motivates risk-averse certain choices but that loss-framed information motivates choices in which outcomes are uncertain, probabilistic, or risky. Moreover, we have also reported findings indicating that framing effects may be mediated by individual differences in the way people process health-relevant information. We have found interesting differences for people whose self-regulatory activities are organized around promotion versus prevention. Other individual differences in the way people respond to positive and negative information about themselves, such as monitoring versus blunting, may also be important in understanding framing (e.g., Miller et al., 1999).

Materials designed to influence health behavior—from billboard slogans to television PSAs—often are designed without much assistance from psychological theory. Yet the literatures concerning persuasion, social influence, and decision making may provide guidance for maximizing the effectiveness of these messages. Prevention behaviors may be better promoted by focusing on the positive consequences of adopting them. So, for example, warnings from the surgeon general on packages of cigarettes probably should focus on the benefits of cessation (e.g., increased stamina) rather than on the deleterious effects of continuing to light up (e.g., heart disease). Conversely, reminders to obtain annual mammogram screenings targeted to women over 40 years of age should make salient the negative consequences of ignoring this periodic event. Recent emotionally evocative PSAs shown on Connecticut television stations, for example, featured husbands and children who lost partners and mothers to breast cancer.

Influential health messages can be created by teams of psychologists with expertise in persuasion, health educators with an understanding of how such information is comprehended, and advertisers with a flair for the creative if they are based on principles of attitude change, motivation, and decision making. We look forward to the interdisciplinary development of an arsenal of health messages that really work.

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