

The Effect of Message Framing on Breast Self-Examination Attitudes, Intentions, and Behavior

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In this study we tested the framing hypothesis that a pamphlet stressing the negative consequences of not performing breast self-examination (BSE) would be more persuasive than a pamphlet emphasizing BSE's positive consequences. College-aged female subjects were exposed to a loss-frame pamphlet, a gain-frame pamphlet, or a no-arguments pamphlet, or they received no pamphlet describing the importance of and the techniques for performing BSE. Attitudes toward BSE and intentions to perform BSE were assessed immediately after this intervention and again 4 months later. The follow-up also assessed subjects' postexperimental BSE behavior. Consistent with predictions, subjects who read a pamphlet with arguments framed in loss language manifested more positive BSE attitudes, intentions, and behaviors than did subjects in the other three conditions. The greater impact of the loss pamphlet could not be attributed to greater fear arousal, better memory for pamphlet content, greater perceived susceptibility to breast cancer, or stronger beliefs in BSE's efficacy on the part of the loss subjects. Only measures of perceived self-efficacy in performing BSE were differentially affected by the framing manipulation, with loss subjects reporting the greatest levels of self-confidence. The results are discussed in terms of prospect theory's framing postulate and a simpler negativity-bias conceptualization, and underlying mechanisms such as differential salience and vividness are considered. Clinical implications of the findings are also explored.

Failure to comply with recommended health-care behaviors is a major contributor to death and disability in this country (e.g., Belloc, 1973; Stachnik, 1980). Research indicates that nonadherence rates are often extremely high, particularly for discretionary preventive and diagnostic behaviors such as quitting smoking, getting exercise, and performing monthly breast self-examination (BSE; see Ley, 1982; Masur, 1981). In the present study, we investigated an intervention designed to increase the performance of BSE among college-aged women. This health behavior was chosen for a number of reasons, including the high prevalence of breast cancer among American women (American Cancer Society, 1983), the relatively high survival rates associated with this disease when it is diagnosed at an early stage (American Cancer Society, 1983), and the potential effectiveness of monthly BSE as an aid in the early detection of malignant breast lumps (e.g., Foster & Costanza, 1984).¹

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In addition, BSE is easy to learn and perform, and it requires no personal sacrifice other than approximately 5 min per month. Despite these advantages, remarkably few women adhere to the well-publicized American Cancer Society recommendation that BSE be performed on a regular monthly basis (e.g., Bennett, Lawrence, Fleischmann, Gifford, & Slack, 1983).

Why is BSE performed so infrequently, even among women who are well aware of its importance (e.g., Grady, 1984; Hill, Rassaby, & Gray, 1982; Howe, 1981)? Previous analyses have suggested a number of distinctive (although not necessarily unique) features that might contribute to low adherence rates. For example, unlike many health-care behaviors (e.g., quitting smoking), doing BSE requires women to remember to perform an infrequent behavior (e.g., Carstenson & O'Grady, 1980; Grady, 1984; Zapka & Mamon, 1982), to learn to perform a specific skill (e.g., Edwards, 1980; Hill et al., 1982), and to maintain a behavior that, because of its private nature, may receive little external reinforcement (e.g., Grady, Goodenow, & Wolk, 1984).

Although all of the aforementioned attributes are potentially important determinants of low adherence (e.g., Grady, 1984; Grady et al., 1984; Hill et al., 1982), a fourth feature of BSE

¹ Despite some controversy in the medical literature regarding the ultimate efficacy of BSE for the early diagnosis and treatment of breast cancer (e.g., Frank & Mai, 1985; A. B. Miller, Chamberlain, & Tschekovski, 1985; Skrabanek, 1985), the American Cancer Society and the National Cancer Institute continue to recommend monthly BSE. Because this behavior is recommended for all adult women, college-aged women who are developing their adult health care habits may be a particularly appropriate group for research of the kind reported in this article.

struck us as particularly notable. In the short run, BSE is a risky behavior that involves uncertain outcomes: You don't do it to prevent cancer, you do it to detect cancer (see Leventhal & Watts, 1966). Deciding to perform BSE requires that a woman risk aversive consequences in the present (e.g., finding a lump, experiencing anxiety) in hopes of enhancing future outcomes (e.g., living a longer life). Of course, in the long run, not performing BSE clearly entails risks (e.g., failing to detect a malignancy). However, because of their temporal remoteness, such longer term considerations may be less salient than short-term considerations and, thus, less influential in determining the monthly decision to perform BSE (see Mischel, 1974; Nisbett & Ross, 1980).

Consistent with the assumption that the risk of finding a lump is an important deterrent to BSE performance, surveys indicate that the fear of finding a lump is a frequently mentioned reason for nonadherence (Mahoney, 1977; Turnbull, 1978; Women's Attitudes Regarding Breast Cancer, 1975). To test this assumption further, we conducted a pilot study. Undergraduate women ($N = 21$) reported the frequency of their BSE behavior and the extent to which they thought about each of 10 frequently cited deterrents to BSE (e.g., too young to bother) when deciding whether to perform the exam. The results showed that the strongest correlate of low-BSE performance was the item "I don't want to take the risk of finding a lump" ($r = .64, p < .001$). Moreover, of the three remaining items that correlated significantly with BSE performance, two tapped other immediate costs—being nervous about what one would find ($p < .04$) and being uncomfortable touching one's breasts ($p < .02$; "preferring to let my doctor do the exam" was the third item to reach significance). The pilot data thus supported the idea that the perceived riskiness of BSE may be associated with nonadherence.

When do people decide to take a risk that may pay off in the long run? A search for relevant psychological principles suggested that the *framing postulate* of Kahneman and Tversky's (1979, 1982; Tversky & Kahneman, 1981) prospect theory might have heuristic value for predicting decisions to perform BSE. Developed to explain decision making under risk, this postulate assumes that people encode information relevant to risky decisions in terms of potential gains or potential losses from some flexible and psychologically determined reference point such as current wealth or health. And, because different presentations of factually equivalent information are postulated to change the location of the reference point, such framing manipulations can influence whether people encode information as gains or losses. Furthermore, Kahneman and Tversky assumed that an S-shaped function relating outcomes to their subjective values is concave in the gain domain (i.e., when people evaluate potential gains) but both convex and steeper in the loss domain. The S-shaped function and the assumption that framing manipulations affect whether outcomes are encoded as gains or losses lead to the prediction that risky behavioral choices will be more likely when information is framed in terms of the relative disadvantages (vs. advantages) of behavioral options. This framing prediction has received substantial support in the hypothetical decision-making problems studied by Kahneman and Tversky (e.g., 1979, 1982), and it has also been successfully applied to understanding hypothetical health decisions

(e.g., Eraker & Sox, 1981; McNeil, Pauker, Sox, & Tversky, 1982).

The framing hypothesis tested in the present study was that a pamphlet promoting BSE compliance would be more effective if it contained persuasive arguments stressing the negative consequences of nonadherence rather than arguments stressing the positive consequences of performing BSE. Underlying this hypothesis is the assumption that performing BSE is a risk-seeking behavior, whereas not performing BSE is a risk-averse choice.² When arguments supporting the importance of BSE are framed to emphasize the positive consequences of BSE adherence, women may encode these arguments as relative gains from a neutral reference point, namely, a current belief in being cancer-free (see Weinstein, 1982, for a discussion of the optimism bias in self-perceived health status). Because risk aversion is assumed to predominate in this situation, women should presumably adopt the risk-averse option of avoiding BSE. However, exposure to arguments that emphasize the potential losses inherent in nonadherence may shift the reference point from one of relative optimism regarding health status to one of some doubt (in that the message may alert women to the fact that, without checking, they cannot be certain that lumps are absent). In this loss domain, women should encode arguments as relative losses from their original reference point, and because risk seeking should be enhanced, they may be motivated to engage in BSE in the hopes of alleviating their doubts about their health status and, thus, returning to their original reference point (see Tversky & Kahneman, 1981, p. 456).

Although inspired by prospect theory's framing postulate, our hypothesis concerning the greater persuasiveness of loss-framed BSE messages is also consistent with a simpler theoretical perspective that requires only the assumption that subjective utility curves for losses are steeper than for gains (Kahneman & Tversky, 1979; Kanouse & Hanson, 1972). Theorizing associated with the *negativity bias* effect in person perception and decision-making research—the finding that negative information exerts a greater judgmental impact than objectively equivalent positive information (e.g., Anderson, 1965; Birnbaum, 1972; Fiske, 1980; Slovic & Lichtenstein, 1968)—suggests that losses may be weighted more heavily than gains be-

² The problem of predicting BSE performance is not unequivocally analogous to the decision problems studied by Kahneman and Tversky (e.g., 1979). In those problems, risk-averse behavioral choices are defined as those that result in certain outcomes (e.g., a sure loss of \$5) and risk-seeking choices as those that result in uncertain outcomes (e.g., a 50% chance to lose \$10 and a 50% chance to lose nothing). The choices of performing BSE or not performing BSE are not unequivocally "risky" in this sense, in that neither option is associated with a certain outcome over time. When future consequences are considered, neither behavioral option yields a certain outcome. However, in terms of immediate consequences, not performing BSE could be viewed as yielding a relatively certain outcome (no chance of finding a lump), whereas performing BSE does pose uncertainty ($X\%$ chance of finding a lump and a $100 - X\%$ chance of finding nothing). Thus, assuming (as we do) that short-term considerations exert a powerful influence on BSE behavior, the decision to perform BSE can be seen as relatively analogous to the decision-making problems to which the framing postulate has heretofore been applied. In this case, performing BSE is the risk-seeking option, whereas not performing BSE is the risk-averse choice.

cause negative information may be perceptually salient in a world that perceivers construct as primarily positive (Kanouse & Hanson, 1972; Sears & Whitney, 1972). Indeed, to the extent that BSE performance is low because women weight the immediate negative consequences of performing BSE more heavily than the longer term positive consequences, compliance might be enhanced if the negative consequences of nonadherence are made more salient.

Most persuasion studies that have compared positive appeals with negative appeals have explicitly contrasted low- and high-fear-arousing messages (see McGuire, 1985, for a review). Although findings in the fear appeal literature are somewhat inconsistent, the modal result is greater persuasion for high-fear messages (see Higbee, 1969; Leventhal, 1970; and Sutton, 1982, for reviews). Only a few previous studies have used message manipulations more comparable to the current framing manipulation (i.e., emphasizing the positive consequences of adopting vs. the negative consequences of not adopting some proposal). McCroskey and Wright (1971) found a nonsignificant tendency for a *punishment-oriented* message to induce greater persuasion than a *reward-oriented* message. Similarly, McArdle (1972) found no significant difference between a positive and negative appeal to join an alcohol treatment group, but she did find that only the negative appeal significantly enhanced persuasion relative to a no-message control group. In another study (Powell & Miller, 1967), a negative (vs. positive) message significantly increased opinion change, but only when the communicator was highly credible. Finally, in the only past persuasion study explicitly guided by prospect theory's framing postulate, Yates (1982) studied consumers' decisions to purchase energy-saving devices for their homes. Her results indicated that a negatively (vs. positively) framed message enhanced persuasion, but only when the message advocated a low- (vs. high-) cost energy device.

Existing persuasion research thus lends some (albeit not strong) support for the prediction that messages stressing the losses associated with inaction will be more persuasive than messages stressing the gains associated with action. With the exception of prospect theory's implicit assumption that a loss (vs. gain) frame increases motivation for risk-seeking behavior, neither this theory nor most prior research on positive versus negative appeals provides much insight into the cognitive and affective mechanisms that might underlie the greater persuasiveness of a loss-framed message. As suggested by the fear appeal literature, fear arousal might provide a plausible mechanism because it seems possible that the loss (vs. gain) version of our experimental pamphlet might engender negative emotional reactions. We also considered the possibility that subjects might pay greater attention to the loss (vs. gain) pamphlet because of its potentially greater salience or vividness, or both (Fiske & Taylor, 1984; Nisbett & Ross, 1980; Taylor & Thompson, 1982). The idea that the loss pamphlet might be more salient stemmed not only from Kanouse and Hanson's (1972) suggestion that negative information is highly salient owing to a general positivity bias in social perception but also from our observation that of seven widely disseminated BSE pamphlets, all included gain statements and only one contained even a small number of loss statements. In addition, the idea that the loss pamphlet might be more vivid stemmed from our speculation that the potential

negative consequences of not doing BSE (e.g., more extensive surgery; see Method section) might be more striking and easier to imagine than the positive consequences of performing this behavior (Nisbett & Ross, 1980). Finally, we also explored the possibility that the framing manipulation might affect subjects' BSE attitudes and behavior via its influence on one or more of the variables (e.g., perceived susceptibility to breast cancer, perceived efficacy of BSE as a coping response) accorded importance as predictors of health behavior within protection motivation theory (Rogers, 1975, 1983; Rogers & Mewborn, 1976) and the related health belief model (Becker, 1974; Becker & Maiman, 1975).

In this study, college-aged women read a pamphlet that presented some basic facts about breast cancer, recommended BSE as an early diagnostic aid, and gave instructions on how to perform BSE. In two experimental conditions, these pamphlets also contained persuasive arguments framed in either gain or loss language. After reading the pamphlets, these subjects, as well as control subjects who received either a pamphlet without arguments or no pamphlet at all, indicated their BSE attitudes and intentions. Four months after this initial phase, subjects were recontacted so we could gauge the behavioral impact of our intervention. We expected that subjects exposed to the loss pamphlet (vs. all other subjects) would express more positive BSE attitudes and intentions and, at the follow-up, would report having performed BSE more frequently during the preceding 4 months. Measures designed to assess possible underlying mechanisms were also included in the study. For example, to tap fear arousal, subjects' emotional reactions to the pamphlets were assessed and, to address one mechanism by which salient and vivid information exerts a greater judgmental impact (Nisbett & Ross, 1980; Taylor & Thompson, 1982), subjects' recall of persuasive arguments and BSE technique was assessed. Finally, we also assessed subjects' appraisal of the threat of breast cancer (i.e., severity and susceptibility) and their appraisal of the recommended coping response, BSE (i.e., response efficacy and self-efficacy; Rogers, 1983).

Method

Subjects

Ninety female undergraduates received extra credit toward their course grades for participating in the laboratory session. Of these subjects, 9 (evenly distributed among conditions) could not be contacted for the follow-up, 1 refused to participate, and 1 failed to answer a substantial number of questions. The analyses are based on the 79 subjects who completed both phases of the study.

Procedure

Laboratory session. Subjects participated in groups of 3 to 8 persons, with each group randomly assigned to one of four conditions. In the laboratory, subjects were greeted by a female experimenter who introduced the study as a "health attitudes" survey and asked them to complete some background questionnaires. The first four questionnaires included S. M. Miller's (1981) 34-item Monitor-Blunter Scale, Spielberger's (1972) 20-item Trait Anxiety Scale, a 13-item Social Desirability Scale (Reynolds, 1982), and the 16-item Health Opinion Survey (Krantz, Baum, & Wideman, 1980). On the fifth questionnaire, subjects indicated the number of times in the past year they had performed BSE

and, on 9-point scales, responded to 15 additional items tapping their knowledge about BSE (e.g., "How well informed do you consider yourself to be about BSE?"), perceived ability to perform BSE (e.g., "How confident do you feel about your ability to detect changes in your breasts?"), and feelings about BSE (e.g., "How comfortable do you feel about touching your breasts while performing BSE?").

These premeasures were included to explore the possibility that the framing manipulation might interact with one or more individual-difference variables to affect subjects' responses to the pamphlets. Because subsequent analyses on the major dependent variables yielded no such interactions, this aspect of the study is not discussed further.³

After completing the premeasures, subjects in the gain-, loss-, and no-arguments-pamphlet conditions (see Independent Variables section) were told that another aspect of the study concerned health pamphlets and that today's session involved having them read a pamphlet about breast self-examination. These subjects then spent approximately 3 min reading one of the three versions of the BSE pamphlet. Immediately after, they completed a questionnaire that assessed their BSE attitudes, intentions, and other responses (see Postexperimental Measures section, which follows). For no-pamphlet control subjects, this questionnaire was distributed a few minutes after the premeasures with the instructions, "This questionnaire concerns some of your other opinions about BSE."

Next, subjects were told (in a limited debriefing) that the study concerned "health pamphlets" (pamphlet subjects) or "health practices such as BSE" (no-pamphlet controls) and that the study's goal was to design effective pamphlets. Finally, subjects were asked not to discuss the experiment, were given their credit slips, and were excused.

Follow-up interview. Approximately 4 months later (M delay = 18 weeks, range = 16–22 weeks), subjects were telephoned by a female experimenter (blind to condition) who asked them to answer some additional questions. During the approximately 15-min interview, the experimenter read questions from a standard questionnaire and recorded subjects' verbal responses. This questionnaire (see Postexperimental Measures section) was similar to the immediate postexperimental questionnaire, but in addition, it assessed subjects' BSE behavior during the 4 months since the laboratory session. After the interview, the experimenter fully debriefed subjects as to the study's design and purposes, answered questions, and thanked them for participating.

Postexperimental Measures

The major dependent variables included subjects' postexperimental BSE attitudes, intentions, and behavior, their recall of pamphlet content, their emotional reactions to the pamphlets, their perceptions of the threat of breast cancer, and their appraisal of BSE as a coping response. Detailed descriptions of these and other ancillary measures follow. Unless otherwise specified, subjects responded to the dependent measures on 9-point scales at the laboratory session and on 5-point scales during the follow-up interview.

Attitudes. Both in the laboratory and in the follow-up call, subjects rated their agreement with the recommendation that women perform regular monthly BSE, the extent to which they thought BSE was important in the diagnosis of breast cancer, and the extent to which they felt BSE had drawbacks. At both times, subjects also indicated the number of times in the next year they thought they should perform BSE. Because these four items were highly intercorrelated, subjects' responses were transformed to z scores and summed to form one composite BSE-attitude index.

Intentions and behavior. In the laboratory and at follow-up, subjects wrote down the number of times in the next year they *actually* intended to perform BSE. Two additional intention measures were assessed only in the laboratory: Subjects rated the likelihood that they would perform BSE in the future and the extent to which being in the study had made

them more (vs. less) likely to perform BSE. The first questions posed to subjects at the follow-up concerned their BSE behavior in the 4 months since their laboratory participation. For each month, subjects indicated whether they had or had not performed BSE. Responses to these dichotomous items were summed to form one BSE-behavior index that ranged from 0 to 4.

Recall of arguments and breast self-examination technique. At the laboratory session only, subjects in the three pamphlet conditions were asked to write down any arguments that the pamphlet mentioned in relation to the importance of BSE. A total recall index was formed for each subject by scoring each of the six possible target arguments (described later) for correctness (on a 4-point scale) and then summing these scores. The two independent raters (blind to condition) who scored these responses attained high agreement ($r = .92$). All subjects were asked at the laboratory posttest to describe the correct procedures for performing BSE. The two raters who scored these open-ended responses for correctness (on a 7-point scale) attained high agreement ($r = .89$).

Emotional reactions. In the laboratory and in the follow-up call, subjects rated the extent to which exposure to the experimental materials had made them fearful, anxious, uncomfortable, nauseated, and reassured. On the basis of a factor analysis of these items, one composite fear index was formed (sum of subjects' responses to the first four items). Subjects' "reassured" ratings, which did not cluster with the others, were analyzed separately.⁴

Threat and coping appraisal. To assess the two components of threat appraisal, subjects rated (at both posttests) the extent to which breast cancer was a frightening and dangerous disease (perceived severity) and the likelihood that they personally would get breast cancer (perceived susceptibility). The first component of coping appraisal, response efficacy, was assessed by three measures administered at both posttests: Subjects rated BSE's effectiveness in the diagnosis of breast cancer, the likelihood that BSE could affect one's medical outcome, and the likelihood that people would die from breast cancer if they didn't (vs. did) perform BSE. Finally, self-efficacy, the second component of coping appraisal, was assessed by subjects' laboratory and follow-up ratings of how confident they were that performing BSE would enable them to detect a lump in their breasts and by their follow-up ratings of the extent to which they believed they could learn to do BSE effectively.

Others measures. At both posttests, subjects rated the extent to which they had a great deal (vs. nothing at all) to gain by doing BSE and lose by not doing BSE. As a further check on the framing manipulation,

³ A number of other preexperimental measures were also included in order to obtain additional descriptive information about our subject sample. For example, subjects reported the extent to which they engaged in a number of healthy and unhealthy behaviors (e.g., exercise), whether they had experienced medical problems with their breasts (only 3 subjects responded in the affirmative), the number of people they knew who performed BSE regularly, how they had learned to do BSE in the past (e.g., "Doctor taught me"), and their family history regarding breast and other forms of cancer. With the exception of noting that subjects in the four conditions did not differ with respect to these items, these measures are not discussed further because of their tangential relevance to the main purposes of the experiment.

⁴ To probe more subtly for subjects' emotional reactions to the pamphlets, we told subjects toward the end of the follow-up interview that "some women had experienced emotional reactions to the laboratory materials." After asking subjects to recall whether they had received a pamphlet in the laboratory, those who had received a pamphlet were asked to rate (on 5-point scales) the extent to which "most women would have experienced" the five emotions described in the text. Because analyses of these items yielded no significant treatment effects, they are not discussed further.

two independent raters coded each recalled argument in terms of whether it was phrased in gain or loss language or was ambiguous. On the basis of these judgments (interrater agreement = 94%), two indexes were formed: the number of arguments recalled in gain language and the number recalled in loss language.

Toward the end of the follow-up interview, subjects rated the extent to which the laboratory materials had presented too negative (vs. positive) a view of BSE and breast cancer and the extent to which being in the study had changed their attitudes and behaviors in 8 different ways (e.g., made them more likely to recommend BSE to a friend). On the basis of a factor analysis of the latter items, three composite indexes were formed: negative BSE feelings (e.g., less comfortable about BSE), positive BSE feelings (e.g., less worried about breast cancer), and positive BSE behaviors (e.g., more interested in seeking information about BSE and breast cancer).⁵

Independent Variables

Subjects in the gain-frame, loss-frame, and no-arguments conditions read a five-page pamphlet entitled "Breast Self-Exam," whereas subjects in the no-pamphlet control condition did not. The pamphlets were designed to be similar to those distributed by the American Cancer Society (ACS) and the National Cancer Institute (NCI). Pages 1, 3, and 4 were identical for subjects in the three pamphlet conditions. Page 1, titled "Some Basic Facts," included the ACS's recommendation that all women perform monthly BSE and information about the prevalence of breast cancer (e.g., 1 in 11 American women develop breast cancer). Pages 3 and 4 of the green fold-out pamphlet presented information describing when and how to do BSE (both the Mirror and Clock exam were described and pictorially illustrated).

Page 2 of the pamphlet differed for the three pamphlet conditions. For no-arguments subjects this page was blank. For gain- and loss-frame subjects, however, page 2 contained six arguments supporting the importance of BSE. Although factually equivalent, these arguments were framed in terms of either the positive consequences of doing BSE (gain condition) or the negative consequences of not doing BSE (loss condition). In the following two example arguments, phrases common to both conditions appear without parentheses or brackets, whereas words used only in the gain or only in the loss version appear in parentheses or brackets, respectively.

By [not] doing BSE now, you (can) [will not] learn what your normal, healthy breasts feel like so that you will be (better) [ill] prepared to notice any small, abnormal changes that might occur as you get older.

Research shows that women who do [not do] BSE have (an increased) [a decreased] chance of finding a tumor in the early, more treatable stage of the disease.

Finally, for subjects in all three pamphlet conditions, page 5 of the pamphlet contained four summary remarks typical of most ACS and NCI pamphlets (e.g., "Most breast problems are *not* cancerous, but they should be checked by a physician."). In addition, gain- and loss-frame subjects read the following closing statement:

You can (gain) [lose] several potential health benefits by (spending) [failing to spend] only 5 minutes each month doing BSE. (Take) [Don't fail to take] advantage of this opportunity.

Results

For dependent measures assessed both in the laboratory and 4 months later, Treatment (4) \times Time of Posttest (2) mixed analyses of variance (ANOVAs) were performed. Prior to the analyses, these measures (or composite indexes) were converted

to *z* scores because most of the laboratory and follow-up measures had been assessed on either a 9- or 5-point scale. For variables assessed at only one posttest, one-way ANOVAs were conducted.

Checks on Experimental Design

Within the pamphlet conditions, subjects' propensities to phrase the arguments they recalled in gain and loss language, respectively, differed in the expected way. Subjects in the gain condition phrased more of their recalled arguments in gain language ($M = 1.81$) than did subjects in the loss condition ($M = 1.04$) or in the no-arguments condition ($M = .17$), $F(2, 59) = 18.96$, $p < .001$. Similarly, loss subjects phrased more of their recalled arguments in loss language ($M = .70$) than did gain or no-arguments subjects (M s = .05 and .00, respectively), $F(2, 59) = 8.07$, $p < .001$. Subjects' laboratory and follow-up ratings of how much they stood to gain by doing BSE and to lose by not doing BSE also patterned as expected. On the gain ratings, the two-way ANOVA yielded only a treatment effect, $F(3, 74) = 3.37$, $p < .03$, which showed that gain subjects reported having the most to gain by doing BSE ($M = .24$; M s = $-.07$, $.21$, and $-.46$ for loss, no-arguments, and no-pamphlet subjects, respectively). On the loss ratings, no significant effects were obtained, although the trend was for loss subjects to report having the most to lose by not doing BSE.

Breast Self-Examination Attitudes

The Treatment \times Time ANOVA on the composite attitude index yielded a significant treatment main effect, $F(3, 75) = 2.80$, $p < .05$: Collapsed across posttests, subjects who received the loss pamphlet expressed more positive attitudes toward BSE ($M = 1.04$) than did other subjects (M s = $-.04$, $-.38$, and $-.89$ for no-arguments, gain, and no-pamphlet subjects, respectively). Mean attitude scores as a function of treatments and time are shown in Table 1. The patterning of means suggests that the overall trend for BSE attitudes to be more positive in the loss condition was more pronounced at follow-up. Although pair-wise comparisons indicated that the loss condition was significantly different from all others at follow-up (p s $< .05$) but different only from the no-pamphlet condition at the immediate posttest ($p < .05$), the Treatment \times Time interaction did not approach significance. The time main effect was also non-significant.

Breast Self-Examination Intentions

The intention data indicated that the predicted superiority of the loss pamphlet was apparent only at the 4-month follow-up. One-way ANOVAs on the two intention measures, administered

⁵ Two final questions posed at the follow-up probed for history effects. Subjects were asked whether they had come across any information about BSE and breast cancer since their laboratory participation, and those who said yes (29.1%) were asked to indicate what type of information (e.g., magazines, pamphlets, TV) they had seen. These measures are not discussed further because chi-square analyses revealed no differences among the experimental groups (both p s $> .45$).

Table 1
Breast Self-Examination (BSE) Attitudes, Intentions, and Self-Reported Behavior as a Function of Experimental Condition and Time of Measurement

Dependent measure	Time of measurement	
	Immediate posttest	4-month follow-up
Gain-pamphlet condition		
Attitudes	-0.41	-0.34
Intentions	5.95	3.95
Behavior	—	0.74
Loss-pamphlet condition		
Attitudes	0.86	1.22
Intentions	6.35	5.48
Behavior	—	1.42
No-arguments-pamphlet condition		
Attitudes	0.24	-0.32
Intentions	6.83	2.78
Behavior	—	0.74
No-pamphlet control condition		
Attitudes	-0.90	-0.87
Intentions	5.18	3.47
Behavior	—	0.75

Note. Higher numbers indicate more positive attitudes toward BSE, stronger intentions to perform BSE in the next year, and a higher frequency of self-reported BSE behavior between laboratory posttest and follow-up. Cell *ns* were 21, 23, 18, and 17 for gain, loss, no-arguments, and no-pamphlet conditions, respectively.

only in the laboratory, revealed no greater tendency for loss subjects to express heightened BSE intentions: The treatment effect was nonsignificant ($F < 1$) on subjects' judgments of how likely they were to perform BSE in the future. And, although this effect was significant on subjects' ratings of whether they were more (vs. less) likely to do BSE in the future, $F(3, 74) = 3.31$, $p < .03$, it reflected the lower intentions expressed by subjects who had not read a pamphlet ($M = 6.94$) relative to those who had ($M_s = 7.86, 8.00$, and 8.17 for gain, loss, and no-arguments subjects, respectively).

On subjects' laboratory and follow-up reports of the number of times in the next year they *actually* intended to perform BSE, the overall treatment effect proved nonsignificant ($F < 1$), although the trend was for loss subjects to express greater BSE intentions ($M_s = 5.92$ vs. $4.95, 4.80$, and 4.32 for gain, no-arguments, and no-pamphlet subjects, respectively). However, the ANOVA did yield a significant time of posttest main effect, $F(1, 75) = 28.46$, $p < .001$, which indicated that subjects' intentions dissipated over time ($M_s = 6.10$ vs. 4.02) and, more importantly, a significant Treatment \times Time interaction, $F(3, 75) = 2.97$, $p < .04$. The means for this intention measure are shown in Table 1, where it can readily be seen that there were no differences among conditions at the immediate posttest (simple $F < 1$). However, at follow-up, the predicted differences emerged: The greater BSE intentions expressed by subjects in the loss condition differed significantly from those expressed by subjects in both the no-pamphlet and no-arguments conditions ($p < .05$) and marginally from those expressed by subjects in

the gain condition ($p < .10$). Viewing the interaction from the perspective of simple time effects within conditions provides further evidence for the superiority of the loss pamphlet and also sheds light on why a treatment effect was not detectable immediately. The *only* group of subjects that did not manifest a significant decrease in BSE intentions over time was the loss group, $F(1, 75) = 1.41$, *ns* ($p < .05$ or smaller for gain, no-arguments, and no-pamphlet conditions). These time trends, in combination with the relatively strong overall intentions observed immediately (e.g., the grand mean for subjects' likelihood judgments was 7.77 on the 9-point scale), suggest that our failure to detect a significant treatment effect immediately may have been due to a ceiling effect.

Breast Self-Examination Behavior

At the follow-up, subjects reported the number of times they had actually performed BSE during the 4 months since their laboratory participation. To control for differences in subjects' tendencies to overestimate (or underestimate) their BSE behavior, the follow-up behavioral index was submitted to a one-way analysis of covariance (ANCOVA) that used subjects' preexperimental reports of the number of times they had performed BSE in the year prior to the study as a covariate.⁶ Examination of these adjusted mean behavior scores (see Table 1) reveals the superiority of the loss condition. Although the treatment effect only approached significance, $F(3, 74) = 2.36$, $p < .08$, pairwise comparisons confirmed that the loss condition differed significantly from each of the remaining conditions ($p < .05$), which did not differ from one another.⁷

Other Dependent Variables

Recall. Recall of the pamphlet's arguments (assessed only in the three pamphlet conditions) did not differ as a function of the framing manipulation. Although the one-way ANOVA performed on these scores did yield a significant treatment effect ($p < .001$), it reflected significantly poorer recall for no-arguments subjects ($M = .28$) relative to gain and loss subjects, who did not differ from one another ($M_s = 3.14$ vs. 3.22). Similarly, on subjects' abilities to describe proper BSE technique (explained in all three pamphlets), the treatment effect ($p < .001$) indicated poorer knowledge on the part of no-pamphlet sub-

⁶ A one-way ANOVA on the follow-up behavioral index as well as a Treatment \times Time of posttest (pretest vs. follow-up) repeated measures analysis yielded findings virtually identical to those obtained in the ANCOVA.

⁷ To examine the relation between the BSE intentions subjects expressed at the laboratory and their subsequent BSE behavior, we computed the partial correlation between these two measures while statistically controlling for preexperimental BSE frequency. Overall, subjects' intentions were predictive of their later behavior ($r = .23$, $p < .05$), although the magnitude of the relation was small. Examining this correlation within treatments revealed that the intention-behavior relation was nonsignificant for no-pamphlet control subjects ($r = .10$, *ns*) and for subjects who received the gain pamphlet ($r = -.25$, $p < .28$). In contrast, the intention-behavior relation was significant for subjects who received the loss pamphlet ($r = .47$, $p < .03$) and, somewhat surprisingly, also for subjects in the no-arguments condition ($r = .49$, $p < .05$).

jects ($M = 1.41$) relative to subjects in the gain-, loss-, and no-arguments-pamphlet conditions (M s = 4.52, 4.73, and 4.56, respectively), who did not differ from one another.

Emotional reactions. Arguing against the idea that fear arousal might have mediated the observed framing effects on attitudes, intentions, and behavior, the Treatment \times Time ANOVA on the composite fear index yielded no significant effects. Moreover, the patterning of means indicated less fear arousal among loss subjects ($M = -.27$ vs. M s = .10, -.16, and .40 for gain, no-arguments, and no-pamphlet subjects, respectively). On subjects' ratings of the extent to which the experimental materials had made them feel reassured, a significant treatment main effect was obtained ($p < .01$). However, pair-wise comparisons indicated that the only significant ($p < .05$) differences were between no-pamphlet subjects, who reported being least reassured ($M = -.51$), and subjects in both the gain and no-arguments conditions, who reported being the most reassured (M s = .38 and .20, respectively; $M = -.13$ for loss subjects).

Threat and coping appraisal. Measures of threat and coping appraisal were administered in order to assess the possible impact of the framing manipulation on variables accorded predictive importance in Rogers's (e.g., 1983) protection motivation theory and the related health belief model (Becker, 1974). Treatment \times Time ANOVAs on the two components of threat appraisal, subjects' perceptions of the severity of breast cancer and their perceived susceptibility to breast cancer, yielded no significant effects. Similarly, two-way ANOVAs on the three measures of the first component of coping appraisal, the perceived efficacy of BSE in the diagnosis of breast cancer, yielded no significant effects. However, analyses on the two measures included to tap the second component of coping appraisal, self-efficacy, did yield significant differences among the treatment conditions. The two-way ANOVA on subjects' ratings of how confident they were that performing BSE would enable them to detect a lump yielded only a treatment main effect ($p < .02$), and pair-wise comparisons revealed that loss subjects, who reported the highest levels of self-efficacy ($M = .27$), differed significantly ($p < .05$) from no-pamphlet control subjects, who reported the lowest self-efficacy ($M = -.60$). The ratings of gain and no-arguments subjects (M s = .08 and .12) fell between these extremes and did not differ from each other or the other two conditions. The second measure of self-efficacy (administered only at follow-up), which asked subjects to judge the extent to which they believed they could learn to perform BSE effectively, also yielded a treatment effect ($p < .02$). As on the first measure, loss subjects reported the highest levels of self-efficacy ($M = 4.78$), no-pamphlet subjects the lowest ($M = 4.06$), and gain and no-arguments subjects reported moderate levels (M s = 4.33 and 4.39). Pair-wise comparisons revealed that loss subjects differed significantly from both no-pamphlet and gain subjects ($p < .05$) and marginally from no-arguments subjects ($p < .10$). On both measures, then, the loss frame enhanced subjects' perceptions that BSE could be a personally effective coping response.⁸ To explore whether perceived self-efficacy mediated the impact of message framing on BSE behavior, an ANCOVA, which used subjects' laboratory posttest ratings of self-efficacy and preexperimental reports of BSE behavior as covariates, was compared with the main analysis that covaried on preexperimental behavior only. This comparison revealed that the framing effect was

reduced somewhat when subjects' confidence in their abilities to detect lumps was controlled statistically ($p = .078$ vs. .149).

Other measures. Subjects' follow-up judgments of whether the laboratory materials had presented too negative (vs. positive) a view of BSE and breast cancer yielded a significant treatment effect ($p < .03$): Perceptions that the materials were too negative were highest among gain subjects ($M = 2.95$), next highest among no-pamphlet subjects ($M = 2.81$), and lowest among loss and no-arguments subjects (M s = 2.57 and 2.41). Finally, analyses on subjects' follow-up ratings of how the study had influenced their feelings and behaviors yielded a significant treatment effect ($p < .05$) on both the positive-feelings (e.g., less worried about breast cancer) and positive-behaviors indexes (e.g., more interested in recommending BSE to a friend). Both of these effects reflected the fact that no-pamphlet control subjects expressed significantly less positive feelings and behaviors vis-à-vis BSE and breast cancer than did subjects in the three pamphlet conditions (p s $< .05$), who did not differ from one another.

Discussion

The major prediction of this study was that a pamphlet stressing the negative consequences of not performing monthly BSE would be more persuasive than a pamphlet emphasizing BSE's positive consequences. Consistent with this prediction, subjects who read a pamphlet with arguments framed in loss language manifested more positive BSE attitudes, intentions, and behaviors than did subjects who read either a gain-frame pamphlet, a pamphlet with no persuasive arguments, or no pamphlet at all.

These findings are consistent with prospect theory's framing postulate (Kahneman & Tversky, 1979), which asserts that loss framing maximizes risk-seeking behavior. Given that performing BSE requires that women risk finding a lump, stressing the possible losses that could accrue from failing to perform BSE presumably maximized subjects' motivation to take this risk (and, hence, do BSE). Apparently, people are willing to engage in risky behavior in order to avoid losses but are conservative in seeking gains. In this regard, it might have been expected that subjects who received the gain pamphlet would have become *less* likely to perform BSE than subjects in the two control conditions because gain subjects should, presumably, have actively avoided the risk of doing the exam. The failure to demonstrate such risk aversion in the present study is not necessarily incompatible with prospect theory's framing postulate because virtually all prior BSE information to which subjects had been exposed was, as indicated by our review of existing BSE pamphlets, likely to have been framed positively. In essence, subjects may have entered the study in a gain frame regarding BSE, such that they were already avoiding the behavior, and only the loss-

⁸ Because the greater confidence of subjects in the loss condition might reflect little more than the fact that they had obtained greater experience doing BSE (as indicated by the behavioral data), the analyses of the self-efficacy measures were redone using subjects' BSE-behavior scores as a covariate. These analyses indicated that controlling for subjects' recent behavioral experience with BSE did not eliminate the significant treatment effects on the two self-efficacy measures (p s $< .03$ for both variables) or change the patterning of cell means in any way.

frame pamphlet caused a significant reduction in that avoidance.

Although generally consistent with prospect theory, the present findings were not uniquely predicted by this theoretical perspective. The hypothesis that negative information has more impact than objectively equivalent positive information, which has been confirmed in numerous person perception and decision-making studies (e.g., Anderson, 1965; Birnbaum, 1972; Fiske, 1980; Slovic & Lichtenstein, 1968), requires only the assumption that subjective utility curves are steeper for losses than for gains (see Kahneman & Tversky, 1979; Kanouse & Hanson, 1972). Thus, without any additional assumptions or concepts from prospect theory, it might be predicted that a pamphlet stressing the negative aspects of not doing BSE would have a greater persuasive impact than a pamphlet stressing the positive aspects of doing BSE. Although this prediction was initially suggested by the idea (supported by our pilot data) that BSE represents a risk-seeking behavior, whether this assumption was *crucial* in obtaining the present framing effects is uncertain. To date, neither prospect theory's framing postulate nor the more general negativity bias conceptualization (Kanouse & Hanson, 1972) has received much attention in the persuasion area. Thus, future research will be required to determine the extent to which loss-framed messages are equally or differentially effective in enhancing the performance of behaviors that do and do not involve elements of risk and uncertainty (see also Footnote 2).

The present study was also designed to shed light on possible mechanisms that might have accounted for the greater persuasiveness of the loss pamphlet. For example, we speculated that negative information might prove fear-arousing and that subjects would be motivated to reduce this fear by performing BSE (Janis, 1967). This possibility was not substantiated: Loss subjects reported no greater fear in response to the experimental materials than did other subjects. It might be argued that this null result obtained because subjects who did not receive a loss pamphlet were also fearful, but for other reasons. Specifically, to the extent that BSE is an inherently risky behavior for these subjects, the fear of finding a lump (rather than the fear of not obtaining necessary treatments) may have predominated, thus causing them to reduce their fear by avoiding BSE (Janis, 1967). Again, however, we obtained no evidence to support this contention. None of our groups reported a decrease in BSE as a result of their participation, and in fact, all groups reported some increase in this behavior.

We also considered the possibility that the greater persuasiveness of the loss pamphlet might derive from its greater salience or vividness. To examine one mechanism by which salient or vivid information is hypothesized to exert a greater judgmental impact, we assessed subjects' (immediate) recall of the pamphlet's arguments and their recall of proper BSE technique. Analyses of these measures yielded no evidence for differential recall as a mediator for our observed framing effect: Loss subjects manifested no greater immediate memory for the pamphlet's content than did gain or no-arguments subjects. The absence of differences on these memory measures is consistent with previous research, which has also failed to find much evi-

dence for retrieval-based explanations for salience and vividness effects (for reviews, see Fiske & Taylor, 1984; Taylor & Thompson, 1982).⁹

Notwithstanding these null results, differential salience and vividness remain plausible (albeit undocumented) explanations for the present framing results because the judgmental impact of heightened salience and vividness may often occur directly at the encoding (vs. retrieval) stage of information processing and, thus, through mechanisms other than enhanced memory (Fiske & Taylor, 1984; McArthur, 1980; Taylor & Thompson, 1982). Regarding salience, for example, perhaps the positivity bias discussed by Kanouse and Hanson (1972) generally leads individuals to assume that they enjoy good health. Consistent with this bias, people tend to underestimate their own susceptibility to illness (Weinstein, 1982). The loss pamphlet may have made salient for subjects the fact that they do not *really* know whether they are cancer-free. By not performing BSE, the pamphlet asserts, subjects will not know whether they have a potentially malignant breast lump. In order to reaffirm and maintain their previously held belief in their good health status, subjects may choose to increase their performance of BSE. In essence, by making salient the possibility of breast cancer, the loss message may have informed subjects that they were placing themselves at risk by *not* performing BSE (rather than by performing it). With respect to vividness, to the extent that loss subjects were able to imagine the consequences of breast cancer more easily than other subjects, their sense of susceptibility might have increased (Sherman, Cialdini, Schwartzman, & Reynolds, 1985). Although we found no differences among treatment groups in terms of subjects' perceptions of their susceptibility to breast cancer, it is possible, in retrospect, that loss subjects felt more susceptible to the most negative consequences of having breast cancer (e.g., protracted illness, death). Verification of these (or other) relatively specific salience or vividness explanations for the present findings obviously necessitates further research, particularly research that incorporates more sensitive measures of attention and cognitive elaboration (e.g., reading

⁹ Reyes, Thompson, and Bower (1980) found that vivid (vs. nonvivid) information exerted a greater judgmental impact only after a temporal delay and, consistent with retrieval-based explanations for vividness effects, that delayed recall was both greater for vivid (vs. nonvivid) information and significantly correlated with delayed judgments. These authors proposed that vividness effects will not typically occur immediately after exposure to information because, at that time, all information (regardless of its inherent vividness) should be easily recalled. However, because vivid information is hypothesized to leave a stronger memory trace, delayed-judgment and recall measures should reflect the impact of vividness manipulations. Although Taylor and Thompson (1982) concluded that, aside from the Reyes et al. data, there was little evidence for this delayed-impact hypothesis, it is noteworthy that the overall patterning of behavioral-intention data in the present study (and to a lesser extent, the attitude data) is consistent with the Reyes et al. hypothesis that vivid information may be more effective only after the passage of time. In retrospect, then, it is unfortunate that we did not reassess subjects' memory for pamphlet content at the 4-month follow-up interview. According to the Reyes et al. findings and retrieval-based explanations for vividness effects, we might have found enhanced recall on the part of loss subjects at that time.

time, thought listing; see Taylor & Fiske, 1981) than the memory measures used in the present experiment.¹⁰

An additional encoding explanation for our results also merits further empirical scrutiny. As suggested by psycholinguistic research (Gough, 1965; Wason, 1965; see also Lachman, Lachman, & Butterfield, 1979), negative statements such as those that appeared in our loss pamphlet (e.g., "By not doing BSE now, you will not learn . . .") may be more difficult to process than the affirmative statements that characterized the gain pamphlet.¹¹ If so, subjects may have spent more time studying the loss message and elaborating on its meaning and, consequently, may have been more persuaded in the long term (Chaiken, *in press*; see also Wilson, Chaiken, & Axsom, 1986). Although the memory data provided no indication that the loss pamphlet engendered more systematic processing, as noted earlier, recall is only a crude measure of attention and cognitive elaboration and, moreover, is not necessarily diagnostic of the persuasive impact of message content (Chaiken & Stangor, 1987).

With one exception, the variables accorded predictive importance in the health belief model (e.g., Becker, 1974) and in protection motivation theory (e.g., Rogers, 1983) did not appear to mediate the persuasive impact of the experimental pamphlets. As previously noted, we found no differences among groups in terms of their perceived susceptibility to breast cancer. In addition, the treatment groups did not differ in their perceptions of the severity of breast cancer or the efficacy of BSE as an adequate coping response. However, self-efficacy, subjects' confidence in their abilities to perform BSE effectively, did differ across groups, with loss subjects reporting the highest levels of self-efficacy. When ANCOVAs were performed that statistically partialled out self-efficacy, the significance of the treatment effect on BSE behavior was attenuated. Although the reduction in significance was not dramatic, this finding is consistent with Bandura's (1977) argument that perceptions of self-efficacy can be a central determinant of behavior and its maintenance (see also Ajzen, *in press*).

The heightened self-efficacy ratings of loss subjects may have been a direct result of the greater persuasiveness of the loss pamphlet and the fact that one of our persuasive arguments suggested that BSE practice enhances behavioral competence (see Method section, first example argument). Yet, this logic seems unconvincing because ratings of response efficacy were not higher among loss subjects, even though the majority of our arguments were directed toward bolstering subjects' beliefs that BSE is an effective coping response. Moreover, the three subject groups that did receive pamphlets did not differ in terms of their exposure to or recall of the information that was probably most relevant to self-efficacy (i.e., instructions on how to perform BSE). Perhaps confidence served a self-protective function for loss subjects, for whom the risks inherent in inadequate performance were made particularly salient. To believe that one is incapable of performing a potentially life-saving behavior, a behavior described as important for assessing health status, might be threatening and debilitating. Hence, loss subjects may have been highly motivated to believe in their own abilities.

Regardless of the exact mechanism(s) by which the loss pamphlet exerted its impact, its effectiveness in increasing the performance of BSE is of clinical importance. Although several

researchers have suggested that pamphlets often have little influence on BSE performance (e.g., Carstenson & O'Grady, 1980; Kronenfeld, Windsor, Kilgo, & Wichers, 1980), they continue to be disseminated by organizations such as the ACS and probably represent the primary modality through which most women learn about BSE. Among subjects in the present study, for example, pamphlets were the most frequently named mode of having learned about BSE (see Footnote 3). In addition, pamphlets are inexpensive to produce and dispense. In contrast, many interventions that have been shown to increase the performance of BSE (e.g., Boyle, Michalek, Bersani, Nemoto, & Mettlin, 1981; Grady et al., 1984; Parkinson, Denniston, Baugh, Dunn, & Schwartz, 1982) are costly both financially and professionally. Moreover, virtually all of these typically multifaceted interventions include providing women with instructional materials of some sort. For a variety of reasons, then, improvements in standard BSE pamphlets could be of great importance.

Our data suggest that providing arguments that focus on the negative consequences of failing to perform BSE represents one possible improvement over the format of most contemporary pamphlets. The loss condition was the only one in which more than half the subjects claimed to be doing BSE more often after the intervention than before. Specifically, 57% of loss subjects reported an increase in BSE at the 4-month follow-up as compared with 38%, 39%, and 29% of gain, no-arguments, and no-pamphlet subjects, respectively. Interestingly, the positive impact of the loss pamphlet was not apparent immediately. All subjects left the laboratory session expressing relatively strong intentions to perform BSE in the future, despite the fact that on the pretest they had reported having performed BSE an average of only 1.78 times in the previous year. This tendency to report heightened intentions may incorrectly convince medical professionals who teach BSE in their practices that their efforts have been effective. Our findings highlight the need for medical professionals to be aware that immediate postinstructional good intentions may not translate into enduring behavioral change and that such longer term change may require that they discuss the negative consequences of not performing BSE with their patients. Personal attention from a highly credible source may prove even more effective than the relatively impersonal approach taken in the present study.

Subsequent research should assess whether the current findings can be replicated with different populations (e.g., older women), whether the improvements we observed in BSE performance would endure over a longer follow-up period, and whether more direct measures of BSE behavior (e.g., Grady, 1984) would yield similar results. Moreover, field research with loss-framed messages would be useful in determining the impact of verbal administration in a medical center or doctor's office, as well as testing the effect of a loss pamphlet in conjunction with other, more extensive interventions (e.g., those that

¹⁰ Given the plausibility that differential salience or vividness may underlie framing effects in persuasion, it is interesting to speculate that the results of some previous fear-appeals studies that have used manipulations similar to the present one may, at least partially, be explainable in terms of mechanisms other than fear arousal.

¹¹ We thank Susan Fiske for alerting us to this possibility.

provide cues for performance and directly attempt to enhance perceived self-efficacy). In addition to these clinical concerns, a number of broader, theoretical issues have been raised by the present research. As already discussed, further research is needed to explore the relative applicability of prospect theory's framing postulate versus the simpler negativity bias conceptualization in understanding the impact of framing manipulations in persuasion settings. Finally, the precise cognitive and affective mechanisms by which framing influences message persuasiveness are, at present, not fully elucidated.

References

- Ajzen, I. (in press). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action-control: From cognition to behavior*. New York: Springer-Verlag.
- American Cancer Society. (1983). *Cancer facts and figures 1984*. New York: Author.
- Anderson, N. H. (1965). Averaging versus adding as a stimulus-combination rule in impression formation. *Journal of Personality and Social Psychology*, 2, 1-9.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. *Psychological Review*, 84, 191-215.
- Becker, M. H. (1974). The health belief model and personal health behavior. *Health Education Monographs*, 2, 324-473.
- Becker, M. H., & Maiman, L. A. (1975). Sociobehavioral determinants of compliance with health and medical care recommendations. *Medical Care*, 13, 10-24.
- Belloc, N. B. (1973). Relationship of health practices and mortality. *Preventive Medicine*, 2, 67-81.
- Bennett, S. E., Lawrence, R. S., Fleischmann, K. H., Gifford, C. S., & Slack, W. V. (1983). Profile of women practicing breast self-examination. *Journal of the American Medical Association*, 249, 488-491.
- Birnbaum, M. (1972). Morality judgments: Tests of an averaging model. *Journal of Experimental Psychology*, 93, 35-42.
- Boyle, M., Michalek, A., Bersani, G., Nemoto, J., & Mettlin, C. (1981). Effectiveness of a community program to promote early breast cancer detection. *Journal of Surgical Oncology*, 18, 183-188.
- Carstenson, R., & O'Grady, L. F. (1980). A breast self-examination program for high school students. *American Journal of Public Health*, 70, 1293-1294.
- Chaiken, S. (in press). The heuristic model of persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), *Social influence: The Ontario Symposium* (Vol. 5). Hillsdale, NJ: Erlbaum.
- Chaiken, S., & Stangor, C. (1987). Attitudes and attitude change. *Annual Review of Psychology*, 38, 575-630.
- Edwards, V. (1980). Changing breast self-examination behavior. *Nursing Research*, 29, 301-306.
- Eraker, S. A., & Sox, H. C. (1981). Assessment of patients' preferences for therapeutic outcomes. *Medical Decision Making*, 1, 29-39.
- Fiske, S. (1980). Attention and weight in person perception: The impact of negative and extreme behavior. *Journal of Personality and Social Psychology*, 38, 889-906.
- Fiske, S. T., & Taylor, S. E. (1984). *Social cognition*. Reading, MA: Addison-Wesley.
- Foster, R. S., & Costanza, M. C. (1984). Breast self-examination and breast cancer survival. *Cancer*, 53, 999-1005.
- Frank, J. W., & Mai, V. (1985, September 21). Breast self-examination in young women: More harm than good? *Lancet*, pp. 654-657.
- Gough, P. B. (1965). Grammatical transformations and speed of understanding. *Journal of Verbal Learning and Verbal Behavior*, 4, 107-111.
- Grady, K. E. (1984). Cue enhancement and the long-term practice of breast self-examination. *Journal of Behavioral Medicine*, 7, 191-203.
- Grady, K. E., Goodenow, C., & Wolk, C. H. (1984, May). *The effect of reward on compliance with breast self-examination*. Paper presented at the meeting of the Society of Behavioral Medicine, Philadelphia.
- Higbee, K. L. (1969). Fifteen years of fear arousal. *Psychological Bulletin*, 72, 426-444.
- Hill, D., Rassaby, J., & Gray, N. (1982). Health education about breast cancer using television and doctor involvement. *Preventive Medicine*, 11, 43-55.
- Howe, H. L. (1981). Social factors associated with breast self-examination among high risk women. *American Journal of Public Health*, 71, 251-255.
- Janis, I. L. (1967). Effects of fear arousal on attitude change: Recent developments in theory and experimental research. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 3, pp. 166-244). New York: Academic Press.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47, 263-291.
- Kahneman, D., & Tversky, A. (1982). The psychology of preferences. *Scientific American*, 246, 160-173.
- Kanouse, D. E., & Hanson, L. R., Jr. (1972). *Negativity in evaluations*. Morristown, NJ: General Learning Press.
- Krantz, D. S., Baum, A., & Wideman, M. V. (1980). Assessment of preferences for self-treatment and information in health care. *Journal of Personality and Social Psychology*, 39, 977-990.
- Kronenfeld, J. J., Windsor, R. A., Kilgo, J., & Wichers, D. (1980). A community health education program on breast and uterine cancer in Alabama. *Public Education About Cancer: Recent Research and Current Programs*, 55, 8-19.
- Lachman, R., Lachman, J. L., & Butterfield, E. C. (1979). *Cognitive psychology and information processing: An introduction*. Hillsdale, NJ: Erlbaum.
- Leventhal, H. (1970). Findings and theory in the study of fear communications. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 5, pp. 119-186). New York: Academic Press.
- Leventhal, H., & Watts, J. (1966). Sources of resistance to fear arousal communications on smoking and lung cancer. *Journal of Personality*, 34, 155-175.
- Ley, P. (1982). Satisfaction, compliance, and communication. *British Journal of Clinical Psychology*, 21, 241-254.
- Mahoney, L. J. (1977). Early diagnosis of breast cancer: The breast self-examination problem. *Progress in Clinical and Biological Research*, 12, 203-206.
- Masur, F. T. (1981). Adherence to health care regimens. In C. K. Prokop & L. A. Bradley (Eds.), *Medical psychology: Contributions to behavioral medicine* (pp. 441-470). New York: Academic Press.
- McArdle, J. B. (1972). *Positive and negative communications and subsequent attitude and behavior change in alcoholics*. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.
- McArthur, L. Z. (1980). Illusory causations and illusory correlations: Two epistemological accounts. *Personality and Social Psychology Bulletin*, 6, 507-519.
- McCroskey, J. C., & Wright, D. W. (1971). A comparison of the effects of punishment-oriented and reward-oriented messages in persuasive communication. *Journal of Communication*, 21, 83-93.
- McGuire, W. J. (1985). Attitudes and attitude change. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (Vol. 2, 3rd ed., pp. 233-346). New York: Random House.
- McNeil, B. J., Pauker, S. G., Sox, H. C., & Tversky, A. (1982). On the elicitation of preferences for alternative therapies. *New England Journal of Medicine*, 306, 1259-1262.
- Miller, A. B., Chamberlain, J., & Tsechkovski, M. (1985). Self-examination in the early detection of breast cancer. *Journal of Chronic Disease*, 38, 527-540.
- Miller, S. M. (1981). Predictability and human stress: Toward a clarifi-

- cation of evidence and theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 14, pp. 204–256). New York: Academic Press.
- Mischel, W. (1974). Processes in delay of gratification. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 7, pp. 249–293). New York: Academic Press.
- Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings in social judgment*. Englewood Cliffs, NJ: Prentice-Hall.
- Parkinson, R. S., Denniston, R. W., Baugh, T., Dunn, J. P., & Schwartz, T. L. (1982). Breast cancer: Health education in the workplace. *Health Education Quarterly* (Supplement), 9, 61–72.
- Powell, F. A., & Miller, G. R. (1967). Social approval and disapproval cues in anxiety-arousing communications. *Speech Monographs*, 34, 152–159.
- Reyes, R. M., Thompson, W. C., & Bower, G. H. (1980). Judgmental biases resulting from differing availabilities of arguments. *Journal of Personality and Social Psychology*, 39, 2–12.
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *Journal of Clinical Psychology*, 8, 199–125.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology*, 91, 93–114.
- Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In J. Cacioppo & R. E. Petty (Eds.), *Social psychophysiology* (pp. 153–176). New York: Guilford Press.
- Rogers, R. W., & Mewborn, C. R. (1976). Fear appeals and attitude change: Effects of a threat's noxiousness, probability of occurrence, and efficacy of coping response. *Journal of Personality and Social Psychology*, 34, 54–61.
- Sears, D. O., & Whitney, R. E. (1972). Political persuasion. In I. de S. Pool, F. Frey, L. Fein, W. Schramm, N. Maccoby, & E. Parker (Eds.), *Handbook of communications* (pp. 253–289). New York: Rand-McNally.
- Sherman, S. J., Cialdini, R. B., Schwartzman, D. F., & Reynolds, K. D. (1985). Imagining can heighten or lower the perceived likelihood of contracting a disease: The mediating effect of ease of imagery. *Personality and Social Psychology Bulletin*, 11, 118–127.
- Skrabaneck, P. (1985, August 10). False premises and false promises of breast cancer screening. *Lancet*, pp. 316–320.
- Slovic, P., & Lichtenstein, S. (1968). Relative importance of probabilities and payoffs in risk taking. *Journal of Experimental Psychology*, 78(3, Pt. 2).
- Spielberger, C. D. (1972). *Anxiety: Current trends in theory and research* (Vol. 1). New York: Academic Press.
- Stachnik, T. J. (1980). Priorities for psychology in medical education and health care delivery. *American Psychologist*, 35, 8–15.
- Sutton, S. R. (1982). Fear arousal and communication: A critical examination of theories and research. In J. Eiser (Ed.), *Social psychology and behavioral medicine* (pp. 303–337). London: Wiley.
- Taylor, S. E., & Fiske, S. T. (1981). Getting inside the head: Methodologies for process analysis in attribution and social cognition. In J. H. Harvey, W. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research* (Vol. 3, pp. 459–524). Hillsdale, NJ: Erlbaum.
- Taylor, S. E., & Thompson, S. C. (1982). Stalking the elusive “vividness” effect. *Psychological Review*, 89, 155–181.
- Turnbull, E. M. (1978). Effect of basic preventive health practices and mass media on the practice of breast self-examination. *Nursing Research*, 27, 98–102.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211, 453–458.
- Wason, P. C. (1965). The context of plausible denial. *Journal of Verbal Learning and Verbal Behavior*, 4, 7–11.
- Weinstein, N. D. (1982). Unrealistic optimism about susceptibility to health problems. *Journal of Behavioral Medicine*, 5, 441–460.
- Wilson, D. K., Chaiken, S., & Axsom, D. (1986, May). *The cognitive mediation of message framing in persuasion*. Paper presented at the Meeting of the Midwestern Psychological Association, Chicago.
- Women's Attitudes Regarding Breast Cancer. (1975). *Journal of the Medical Association of the State of Alabama*, 44, 419–420, 425–428, 440.
- Yates, S. M. (1982). *Using prospect theory to create persuasive communications about solar water heaters and energy conservation*. Unpublished doctoral dissertation, University of California, Santa Cruz.
- Zapka, J. G., & Mamon, J. A. (1982). Integration of theory, practitioner standards, literature findings, and baseline data: A case study in planning breast self-examination education. *Health Education Quarterly*, 9, 330–356.

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