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Replications and Refinements

Under this heading are brief reports of studies providing data that substantiate, disprove, or refine what we think we know. These Notes consist of a summary of the study's procedure and as many details about the results as space allows. Additional details concerning the results can be obtained by communicating directly with the author.

Strengthening the Persuasive Impact of Fear Appeals: The Role of Action Framing

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RECENT LITERATURE ON FEAR APPEALS in health-related issues, such as breast self-examination to detect breast cancer, has demonstrated that fear arousal may motivate precautionary action (Rogers & Prentice-Dunn, 1997; Witte & Allen, 2000). Furthermore, some recent studies indicated that such actions to detect health problems should be best framed in terms of losses (e.g., "By not performing breast self-examination, you will not detect breast cancer in an early stage and thus may die from it") rather than in terms of gains (e.g., "By per-

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forming breast self-examination, you will detect breast cancer in an early stage and thus may fully recover from it"; e.g., Detweiler, Bedell, Salovey, Pronin, & Rothman, 1999; Rothman, Martino, Bedell, Detweiler, & Salovey, 1999; see also Rothman & Salovey, 1997). Although effects of both alternatives have been reported, no experimental studies to date have been conducted to investigate whether the type of frame—gains of performing versus losses of not performing—moderates the effects of fear arousal on precautionary motivation. In the present study, we tested, among 110 female Dutch undergraduate students, the effects of action frame under conditions of fear arousal. We predicted an interaction effect between fear arousal and action frame that would show that high fear arousal paired with loss information leads to a more positive evaluation of the recommended action than do combinations of (a) high fear arousal with gain information and (b) low fear arousal with either loss or gain information.

The participants were welcomed by a female experimenter and seated in separate cubicles, each equipped with a computer. All information was provided on the computer. Fear arousal was induced by varying information about the threat of breast cancer. In the high-threat condition, the participants read information that stressed the severity of breast cancer and the recipients' susceptibility to it. Breast cancer was described as a serious disease with significant physical and emotional consequences, to which even women younger than 30 years of age are susceptible. In the low-threat condition, the participant's susceptibility to breast cancer was described as low, for example, by the statement "Breast cancer is a form of cancer that is most common among women older than 50 years of age." The severity of breast cancer was ignored by providing boring, biological information about the development of breast cancer along with pictures of cell divisions.

Next, fear arousal was measured by four items on a 9-point scale (1 = *not at all,* 9 = *very much*): "To what extent did you feel (a) afraid, (b) worried, (c) uncomfortable, (d) frightened while reading the text about breast cancer?" (cf. Mewborn & Rogers, 1979). The four items were combined to form a reliable fear arousal scale (Cronbach's $\alpha = .93$). The participants then read information about performing breast self-examination that was presented either in a loss frame (e.g., "By not performing breast self-examination, your chances to detect breast cancer in an early and better treatable stage will be low") or in a gain frame (e.g., "By performing breast self-examination, your chances to detect breast cancer in an early and better treatable stage will be high"). The main dependent variable was a relative evaluation of the importance of monthly breast self-examination performance compared with five other health behaviors (i.e., not smoking, safe sex, exercise, healthy eating, use of sunscreen; 1 = *most important,* 6 = *least important*). This rank-order measure was preferred over an absolute (Likert-type) measure of the perceived importance of breast self-examination to avoid ceiling effects.

After leaving the cubicles, the participants were extensively debriefed by the experimenter, who was especially alert to any signs of fears expressed by the par-

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ticipants. No such signs were perceived, and none of the participants regretted participating. All the participants were told that their chance of getting breast cancer was actually low because it is most common among women older than 45 years of age. They then received information about breast cancer and breast self-examination, which had been issued by the Dutch Cancer Society, and they were urged to read it carefully.

The fear-arousal measure preceded the breast self-examination information. Therefore, it was possible to include reported fear level by a median split procedure ($Mdn = 4.25$) in a 2 (fear arousal: low vs. high) × 2 (action frame: loss vs. gain) analysis of variance with previous performance of breast self-examination as covariate without seriously hampering causal interpretations. A main effect of fear arousal was found, $F(1, 105) = 4.70$, $p < .05$, but this effect seemed to be qualified by the predicted interaction effect between fear arousal and action frame, which approached conventional levels of statistical significance, $F(1, 105) = 3.30$, $p = .07$. Simple contrast analyses with the high-fear-arousal–loss condition as referent category showed that participants in that condition indeed evaluated breast self-examination as more important ($M = 3.64$, $SD = 1.47$) than did participants in the low-fear-arousal–loss frame condition ($M = 4.56$, $SD = 1.33$), $t(105) = 2.77$, $p < .01$; the low-fear-arousal–gain frame condition ($M = 4.43$, $SD = 1.10$), $t(105) = 2.42$, $p < .05$; or the high-fear-arousal–gain frame condition ($M = 4.28$, $SD = 1.22$), $t(105) = 2.18$, $p < .05$.

In conclusion, the present study was the first study into the effects of action framing on precautionary motivation under conditions of fear arousal. The findings were not conclusive, however. Future research might be specifically directed toward identifying relevant mediating processes and moderating personal variables. For example, it is not clear from the present study whether after the participant reads the loss frame, increased systematic processing could mediate the effects of either action framing or increased feelings of fear. In addition, personal variables such as a need for cognition—that is, people's tendency to engage in thinking—and self-image might be important variables that influence the effects of action framing under conditions of fear arousal (see also Duval & Mulilis, 1999; Mulilis, Duval, & Bovalino, 2000). In a review of the role of need for cognition in persuasion processes, Cacioppo, Petty, Feinstein, and Jarvis (1996) showed that people who are high in need for cognition spent more cognitive effort on persuasive information (thus enhancing the effectiveness of action framing; cf. Rothman & Salovey, 1997) and were more effective problem solvers, thus enhancing the possibility of adaptive coping in response to fear appeals (cf. Ruiter, Verplanken, De Cremer, & Kok, in press). Furthermore, threats to self-image as a result of negatively framed information may decrease the effectiveness of fear appeals and action frames. In a recent study, Sherman, Nelson, and Steele (2000) showed that defensive responses to threat information can be prevented by affirmation processes that keep self-image positive during exposure to threatening information.

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In sum, our findings suggest that attempts to promote detection behaviors among Dutch women by arousing fear might profit from formulations that stress the negative consequences of not performing the recommended action rather than the positive consequences of performing the recommended action. However, further testing is needed not only for breast self-examining but also for other detection behavior such as getting a medical check-up. Further testing is also needed among subpopulations with different gender and age groups and lower education levels.

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