Attributions, Beliefs About Control, and Adjustment to Breast Cancer

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Attributions for cancer and beliefs about control over cancer were examined for their association with adjustment to breast cancer. Although 95% of the respondents made attributions for their cancer, no particular attribution (e.g., stress, diet) was associated with better adjustment. Analyses of attributions of responsibility for the cancer to the self, environment, another person, or chance yielded only a negative relation between adjustment and blaming another person. In contrast, both the belief that one could now control one's cancer and the belief that others (e.g. the physician) could now control the cancer were significantly associated with good adjustment. Of the different types of control, cognitive control was most strongly associated with adjustment, behavior control was less strongly associated with adjustment, and information control and retrospective control were unassociated with adjustment. The theoretical and practical implications of these results are discussed.

Social psychologists have become increasingly interested in how individuals adjust to sudden, unexpected, and/or negative events in their environments. Two constructs that have been useful in this analysis are causal attributions and beliefs in control. In the present study, we examined the usefulness of these constructs in understanding adjustment to breast cancer.

Breast cancer is a major cause of death among American women, striking approximately 1 out of every 11 women (American Cancer Society, 1981). However, because the survival rate is continually improving (e.g., 87% 5-year survival rate for localized breast cancer), many women are living substantial numbers of years with the aftermath of illness and its treatment. Thus, understanding factors that influence quality of life is an important issue.

It is known that breast cancer produces a variety of adjustment problems, including depression (e.g., Anstice, 1970; Brown, 1978; Roberts, Furnival, & Forrest, 1972; Sutherland & Orbach, 1953), anxiety (Ray, 1977; Renneker & Cutler, 1952; Roberts et al., 1972; Sutherland & Orbach, 1953), anger or hostility (Meyerowitz, 1980; Taylor & Levin, 1976), and feelings of shame and worthlessness (Renneker & Cutler, 1952; Shands, Finesinger, Cobb, & Abrams, 1951). Behavioral concomitants of these negative emotions can include insomnia (Brown, 1978; Jamison, Wellisch, & Pasnau, 1978; Renneker & Cutler, 1952), inability to concentrate (Ervin, 1973), loss of appetite (Jamison et al., 1978), greater tranquilizer and alcohol usage (Brown, 1978; Jamison et al., 1978), and thoughts of suicide (Jamison et al.,

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1978; Katz, Weiner, Gallagher, & Hellman, 1970; Renneker & Cutler, 1952). How might social cognitions contribute to the adjustment process?

Attributions

Attribution theory (Harvey & Weary, 1981; Kelley, 1967) maintains that when one encounters a sudden threat or change in one's environment, one will initiate a causal search in an effort to understand the reasons for that threat or change (for evidence, see Pyszczynski & Greenberg, 1981; Wong & Weiner, 1981). Attributional search is thought to be initiated so as to understand, predict, and control threat (Kelley, 1967), and hence may be especially functional early on in the adjustment process. Accordingly, we ventured two hypotheses: first, that breast cancer patients would make attributions for their cancer, and second, that attributions would be made early in the adjustment process, around the time of diagnosis.

There is already some evidence that cancer patients and other ill individuals do form theories about the origins of their illnesses (Bard & Dyk, 1956; Comaroff, 1980; Good & Good, 1980; Koslowsky, Croog, & LaVoie, 1978; Kushner, 1975; Meyerowitz, 1980; Schain, 1976; Taylor & Levin, 1976). However, relatively little of this evidence provides specific information about the content of those theories and their functions. Bard and Dyk (1956) found a high rate of self-blame among cancer patients, and Meyerowitz (May 18, 1980, personal communication) found a high rate of attributing the cancer to God's will. Neither study, however, related content of attributions (e.g., self-blame, environmental blame) to adjustment. The present study provided an opportunity to examine the content of patients' theories about their illness and to determine if any particular theory is associated with successful adjustment.

Since attributions are thought to be made so that individuals feel they can control their environment (Heider, 1958; Kelley, 1967; Wortman, 1976), attributions made to factors under personal control might be more adaptive than attributions made to uncontrollable factors. Bulman and Wortman (1977) found that among quadriplegic and paraplegic victims of accidents, self-blame was associated with superior coping; the authors reasoned that self-blame represented taking personal responsibility for the accident and hence indicated regaining a sense of personal control (see also Chodoff, Friedman, & Hamburg, 1964; Janoff-Bulman, 1979). Consistent with this reasoning, attributions of blame to another person (a factor less likely to be under personal control) were associated with poor adjustment (Bulman & Wortman, 1977).

Other researchers, however, have suggested that self-blame for a negative outcome like cancer can be associated with guilt, shame, or feelings of inferiority, and may lead to poorer adjustment (Abrams & Finesinger, 1953; Bard & Dyk, 1956; Mastrovito, 1974; Weisman, 1975). Attributions to external factors such as another person or environmental factors are thought to leave self-esteem intact (Mastrovito, 1974) and to guard against guilt, self-criticism, and feelings of powerlessness (Bard & Dyk, 1956). The present study afforded an opportunity to test these competing predictions.

Psychological Control

Patients may not only develop theories about where their cancer came from—they may also develop beliefs about whether or not they can control it now. Such beliefs may include whether or not they can influence its growth or affect the likelihood of its recurrence and whether or not the physician and/or treatments are able to control it. What is the functional significance of such feelings of control? There is now a voluminous literature indicating that when people can exert or believe they can exert control over some noxious event, they adjust to that event more successfully (Averill, 1973; Thompson, 1981). For the most part, this empirical literature has examined the effect of manipulated feelings of control on successful adjustment to short-term stressors. However, self-generated feelings of control may have a similar positive effect. Accordingly, we predicted that cancer patients who believe they can exert some control over their cancer will show better psychological adjustment than those who do not hold such beliefs.

Since cancer is likely to be seen as under others' control (e.g., the physician, continuing treatment) as well as under one's own control, the issue of the adaptiveness of vicarious con-

trol is raised. Previous literature has suggested that one's own actions yield greater feelings of control than do actions performed by another in behalf of the self (Langer, 1975; Wortman, 1975). However, in these studies, the controlling response is one that could be carried out in an equally competent manner by self or other. In the case of cancer, physicians and continuing medical treatments can achieve an effect that the patient on his or her own cannot, and so belief in vicarious control may be as important or more important to good psychological coping as belief in self-control among cancer patients.

All types of controlling efforts may not be equally adaptive. Thompson (1981) distinguished among four types of control: cognitive control (thinking about the aversive experience differently); information control (learning about the aversive experience); behavioral control (affecting the aversive circumstance through some direct action); and retrospective control (deciding after the fact that one could have controlled the aversive event and that one presumably can do so in the future). Thompson's analysis of the literature suggests that cognitive control may be most uniformly successful in reducing stress; behavioral control often reduces pre-event stress, but may not successfully reduce stress when an aversive event actually occurs; information control does not have a reliably beneficial effect on coping; and the benefits of retrospective control are still unknown because of insufficient empirical evidence. The present study afforded a preliminary opportunity to examine the effects of each type of control on coping with cancer.

Method

Recruitment of Subjects

Patients were obtained through a three-physician private oncology practice in the San Fernando Valley area of Los Angeles. The practice included 209 breast cancer patients whose records were first screened for suitability to participate in the study. Thirty patients were ruled out because they had severe illness other than cancer (e.g., heart disease); because their cancers were too advanced to make interviewing a possibility; because they had severe psychological problems (e.g., a hospitalized schizophrenic); or because they had moved out of state.

The remaining 179 patients were sent a letter describing the interview study. They were asked to return a form indicating their willingness to be interviewed and also providing the name and phone number of a significant other, preferably the spouse, who would also agree to be interviewed. Eighty-seven women returned the form, producing a response rate of 49%. Nine of these women eventually did not participate because of logistical and scheduling problems. We will comment on the response rate shortly.

Sample

The final sample included 78 women. They ranged in age from 29 to 78, with a median age of 53. Seventy-one percent were married, 20% were single, divorced, or separated, and 10% were widowed. (Percentages exceed 100 due to roundoff errors.) About half the women were employed (49%) either part-time (23%) or full-time (26%). Educational level attained ranged from completing seventh grade to Master's level degree; the median level of education was one year of college. Overall, the education distribution suggests a skew toward the middle and upper socioeconomic classes. The sample also had a somewhat disproportionate Jewish representation: Protestant (46%), Catholic (15%), Jewish (31%), Other (4%), No Religion (4%).

All but 3 of the women had been treated surgically for their breast cancer. Thirty-five percent (26) had had a lumpectomy (removal of only the malignant lump, plus some supportive tissue), 12% (9) had had a Halsted radical mastectomy (removal of entire breast, some adjacent lymph nodes, and part of the pectoral muscles), 39% (29) had had a modified radical mastectomy (removal of the breast and some adjacent lymph nodes), 3% (2) had had a simple mastectomy (removal of the breast only), and 12% (9) had had surgery on both breasts.

Using American Cancer Society staging criteria for initial diagnosis, chart records indicated that 38% were Stage 1 cancers, 45% were Stage 2 cancers, and 18% had distant sites of metastases. In terms of current state of health, one patient was obviously deteriorating at the time of the interview (and has since died), an additional 6 had metastatic breast cancer, 5 had local-regional recurrences of breast cancer, 24 had an uncertain prognosis (e.g., large tumor, some nodal involvement), 17 had small tumors, no nodal involvement, but had been symptom-free for less than 2 years, and 25 had small tumors, no nodal involvement, and had been symptom-free for at least two years. The median length of time since surgery was 25½ months, and the range was from 1 to 60 months. This range provided an opportunity to look at both short- and long-term adjustment to cancer.

Interview

Respondents were telephoned and an interview was arranged, usually in the home. The interview with the significant other was usually also arranged at this time and was scheduled in close proximity to the respondent. At the start of the interview, respondents received an informed consent form, and permission to tape-record the interview was obtained. The average interview lasted between 1½ and 2 hours. The interviewers were the three authors plus two other women in their 40s who had prior interviewing experience. Questions were posed using the standard wording and order of the interview protocol.[1] An initial

[1] All interview and questionnaire materials used in this study are available from the authors.

round of interviewer meetings was held to ensure that questioning and interviewer style were equivalent across interviewers.

The interviewer began with questions about basic demographic data (e.g., age, marital status) and then inquired about details concerning the woman's cancer experience (when symptom was detected, when surgery took place, what kind of surgery was done, whether the woman had had reconstructive surgery, and whether the woman suffered any continuing cancer-related disabilities).

Since attributions and psychological control are the primary foci of this article, these sections of the interview will be described in more detail. Following demographic questions, questions about attributions were asked. The interviewer began with the general statement:

> Many, if not all, people who have had cancer, develop some sort of theory about how they got their cancer. In other words, even though we don't know all the causes of cancer, most people have some hunch or theory about why they have it. I wonder if you would mind sharing your hunch or hunches with me, if you have any. [This wording was paraphrased from Good and Good, 1980, who have studied lay theories of illness extensively.]

If the respondent indicated that she had such a hunch, it was recorded. The respondent was then asked why she had developed the hunch (an open-ended question), when she developed it (in months from symptom), and whether she had had any other hunches (also open-ended). The respondent was then asked a forced-choice question:

> If you had to attribute responsibility for your cancer to one of the following four things, which would it be? Yourself, someone else, the environment, or chance? [This question was paraphrased from Bulman and Wortman, 1977.]

The interviewer next said:

> Let me ask you another question about your hunches. For some people, the issue of where their cancer came from is very important at some point in time even though it may not be any longer. In other words, it's something they think a lot about or thought a lot about at one time. When would you say this question of what caused your cancer or where it came from was important, if at all: When you first detected an abnormality? What about during your recovery? What about now?

The respondent answered each of the three time-period questions by selecting a response option on a 3-point scale (1 = very much, 2 = somewhat, 3 = not at all). The woman was then asked if she had discussed her theory about her cancer with anyone including her physician, spouse, children, or friends.

Next, questions about control were asked. The interviewer asked, "Do you think the course of your cancer (such as whether or not there is a recurrence) is something you have some control over?" Respondents were asked to indicate their answer on a scale of 1 (no control) to 4 (a lot of control).

The interviewer next asked how the woman thought she could control it (an open-ended question). The interviewer then asked, "Do you think the course of your cancer is something that can be controlled by someone or something other than you?" Respondents made their rating using the same 4-point scale. They were then asked who could control the cancer, and in what way (both open-ended). Additional questions on attributions and control were included in the questionnaire and will be discussed shortly.

The next section of the interview covered life changes made since cancer. The woman was first asked to list the changes that had occurred in her life and when each had occurred. Next, specific areas of change were probed. The woman was asked if she had made any changes in her diet, smoking, medications, alcohol consumption, exercise patterns, formal ways of managing stress such as taking a stress management course or assertiveness course, informal ways of coping with day-to-day stress, work life, leisure-time life, religious activities, or new activities. Each change was answered "yes, no" or "increased, stayed the same, decreased." Each answer indicating change was followed with an open-ended probe asking what changes had occurred. The woman was also asked if she had made any other health-related changes. Finally, the woman was asked to indicate on a 5-point scale whether she experienced the changes in her life as positive or negative (1 = very negative to 5 = very positive).

The next section of the interview explored changes in marital, family, and social relationships following cancer. Because these data have been reported elsewhere (Lichtman, Wood, & Taylor, 1982), we will not cover them here.

The next section of the interview asked the woman about her perceptions of her own adjustment. Specifically, she was asked to indicate her level of anxiety, fear, anger, and depression, each on a scale of 1 (not at all) to 4 (very much). She completed this task for her present perception of herself, for her perceptions of herself just before surgery, and for her perceptions of herself during recovery. Only the present self-ratings are analyzed in this article. She was next asked to rate her overall adjustment on a scale of 1 (very bad) to 5 (very good) for all three time periods; again, only the present rating is analyzed here.

The next section of the interview covered how much information the respondent had about cancer, and how she had acquired it. The respondent was asked if she had had contact with cancer-related material through books, TV shows, newspaper articles, magazine articles, other media (such as the medical literature), other women with whom she had discussed cancer, other breast cancer patients, support groups, and a Reach-to-Recovery volunteer. The respondent indicated extent of contact with each on scales of 1 (none) to 4 (a lot), or in the case of support groups and Reach-to-Recovery, 1 (no) or 2 (yes). Contacts were then summed as a measure of cancer information-seeking behavior.

A series of questions regarding how the woman felt she was coping in comparison with other women was next asked. Because this material has been covered elsewhere, it will not be repeated here (Wood, Taylor, & Lichtman, 1982). The final section of the interview concerned compliance with medical treatment, and because it is not relevant to the present research, it will not be included here.

Questionnaire

At the conclusion of the interview, a questionnaire was left with the respondent, to be mailed in within the next few days. (The return rate was 90%.) The questionnaire contained additional measures of attributions for cancer, which used different wording and scales to establish the

reliability of our interview questions; questions concerning beliefs about retrospective control; questions about sexual functioning and religious affiliation; and standardized measures including a nine-item form of the Rotter (1966) Internal-External Locus of Control Scale; the Wallston, Wallston and DeVellis (1978) Multivariate Health Locus of Control Scale; the Profile of Mood States (POMS; McNair & Lorr, 1964); the Rosenberg (1965) Self-Esteem Scale; Campbell, Converse, and Rodgers' (1976) Index of Well-Being; and the Locke-Wallace (1959) Scale of Marital Adjustment. These standardized measures were selected on the basis of their psychometric properties and their prior successful use in studies of chronically ill populations.

The questionnaire attribution items began with a list of 22 variables that might be considered potential causes of breast cancer (e.g., stress, heredity, diet, ethnicity, God's will, a blow to the breast) and asked the woman to rate the causal significance of each for her own case on a scale of 1 (not at all important) to 4 (very important). She was then asked to rate the causal responsibility of the self, some other person, the environment, and chance for her cancer, on five-point scales.

Four questions probed feelings of control. The woman was asked to indicate on scales of 1 (not at all) to 9 (very much) her answers to these questions: "To what extent do you feel that once a person has breast cancer, there is very little they can do about it to affect its course or recurrence?" "Do you feel that the cause of your cancer is something you could have done something about, had you foreseen it?" "Do you feel you ought to have done something sooner to prevent the growth of your cancer?" "Do you feel the cause of your cancer is something that someone else could have done something about, if they had foreseen it?"

Significant Other Interview and Questionnaire

As noted earlier, each respondent was asked to make available a significant other for a brief (half-hour) interview. We successfully interviewed 62 significant others (46 spouses, 1 boyfriend, 6 daughters, 1 daughter-in-law, 2 sons, 1 sister, 2 mothers, and 3 friends). For the most part, these interviews focused on changes in relationships following the cancer, and results are presented elsewhere (Lichtman, Taylor, Wood, Bluming, Dosik, & Leibowitz, 1983; Lichtman, Wood, & Taylor, 1982). However, the significant other was also asked if he or she had a "hunch" about the cause of the patient's cancer, and if so, what it was. These questions were worded identically to the comparable questions in the patient interview. The results on this issue will be presented in this article.

Chart Materials

Patient chart materials were abstracted for date first seen, date most recently seen, which physician the patient was seeing, whether the patient had left the physician's care, whether the patient had been treated initially for cancer by someone other than the current physician, presence of any serious illnesses in addition to cancer, any surgery other than breast surgery, any delay in seeking treatment, stage of cancer, type of cancer, type of surgery, history of radiation therapy, history of chemotherapy, any recurrence(s) of the cancer, any reconstructive breast surgery, any exhibition of noncompliance with therapy, indications of psychological problems (e.g. history of depression, participation in therapy), use of medications other than chemotherapy, use of alcohol, and use of cigarettes.

Interviewer and Physician Ratings

To supplement interview and questionnaire data, we obtained independent ratings of psychological adjustment to the illness from the interviewer and the physician using the Global Adjustment to Illness Scale (GAIS) (Derogatis, 1975). Interviewers were instructed to rate the patients' adjustment at the time of the interview; the physician rated adjustment at the most recent visit.

A physical state rating was also made for each patient using interview and chart materials. This 7 point scale ranged from 1 (obviously deteriorating from metastatic cancer) to 7 (prognosis good, e.g., a small tumor, no nodal involvement, symptom-free for at least 2 years).

Results

Representativeness of Sample

The response rate to our initial contact letter was 49%. Considering that subjects were asked to volunteer for a lengthy interview in their home and to line up a significant other for an interview, we consider this response rate to be quite good. Nonetheless, it does raise possibilities of selectivity in the sample ultimately interviewed. Fortunately, we had obtained chart information not only for our own 87 patients, but also on the 92 who did not return our letter, and so we can compare responders and nonresponders on a variety of measures to see if they differ. The two groups were compared on all 21 chart variables by means of t tests. No significant differences emerged between the two groups on any of these variables. We also compared the physicians' GAIS ratings of the interviewed and noninterviewed patients and found no significant difference. Thus representativeness of the sample on both physical variables and psychological adjustment would seem to be good, at least for this population.

Measure of Adjustment

To create an overall measure of adjustment, 10 individual measures of adjustment were factor analyzed and subjected to a quartimax rotation: the physician's GAIS rating; the interviewer's GAIS rating; the respondent's self-rating of current adjustment (5-point scale); the respondent's self-report of current psychological distress (i.e., summed 4-point rat-

ings of degree of anxiety, fear, depression, and anger); the total score of the Profile of Mood States; the Campbell et al. (1976) Index of Well-Being score; the significant other's rating of the respondent's adjustment (5-point scale); the Rosenberg (1965) Self-Esteem Scale; the Locke-Wallace (1959) Marital Adjustment Scale; and the respondent's self-rating of her coping in comparison with other women (6-point scale).

One principal factor, accounting for 76% of the variance, emerged with six of the items having loadings of 0.51 or greater: physician GAIS score, interviewer GAIS score, the woman's self-rating of adjustment, the woman's summed report of current psychological distress, the Campbell et al. (1976) Index of Well-Being score, and the total score on the POMS. These six scores were combined (weighted by their factor loadings) and standardized for each subject and constituted our global measure of adjustment.[2] The measure is broadly based because it includes estimates of adjustment made by three different individuals, and it includes both standardized and ad hoc measures.

Attributions

We predicted that respondents would have a causal attribution for their cancer. Ninety-five percent of the sample did. As a comparison group against which to judge this rate, significant others were asked whether they had any causal attribution for the patient's cancer. Significant others could, of course, be expected to have also engaged in a causal search, since the cancer had threatened and changed their lives, as well as that of the patient. Nonetheless, their rate of making causal attributions is less (63%). This difference is significant, $\chi^2(1, N = 140) = 22.49, p < .01$, suggesting that the need for an explanation is greater among patients.

We also predicted that attributions would be made early on in the adjustment process. This prediction was not supported. Only 28% of the sample said the question of what caused their cancer was important to them at diagnosis; 71% indicated that it had not been important at this time. In contrast, 41% indicated that it was an important issue during recovery (compared with 58% who said it was not); and 41% indicated that the issue was important to them at the present time (compared to 58% who said it was not). These time period differences, though not significant, suggest that the cause of the cancer may not be an important issue early in the adjustment process, but may become so later on for some individuals. However, these results should be interpreted somewhat cautiously, as they are patient retrospections.

The adjustment scores of those who did and those who did not have theories about their cancer's origins were next compared; the two groups did not differ, $F(1, 73) = 1.04$.[3] Then the adjustment scores of those to whom the issue of causality was important and those to whom it was not important at each of the three points in time (diagnosis, recovery, and the present) were compared. None of the comparisons was significant ($0.29 < t < 1.56$). Taken together, the results suggest that simply having an attributional explanation for one's cancer is not significantly related to adjustment.

The content of respondents' attributions was examined next. Reliability between the interview question assessing attributions and the questionnaire item in which respondents rated the importance of 22 causal factors was calculated. Attribution reported in the interview was the same as that given the highest rating on the questionnaire in 76% of the cases, with reliability across interviewers ranging from 75% to 78%. Coding of the open-ended interview question yielded the following frequencies: stress (41%), a specific carcinogen (32%), heredity (26%), diet (17%), blow to the breast (10%), and other (28%). The percentages exceed 100% because 24% of the sample had theories involving two or more causes.[4]

For each theory (e.g., stress) we compared the adjustment factor scores of those who held it with those who did not, using t tests, to see

[2] For individuals who did not return questionnaires, adjustment scores were computed using the remaining four scores, weighted proportionally.

[3] Although 95% of the sample eventually offered a theory about the origins of their cancer, only 65% initially answered the question probing for theories in the affirmative.

[4] Interviewer differences in frequency of reported theories were not significant except in the case of heredity; one interviewer's respondents were less likely to report heredity as a factor than was true for the other interviewers ($p < .002$).

if any theory was associated with better psychological adjustment. None of these t tests was significant, which suggests that no one theory was better for adjustment than any other. Analyses of rated importance of causal factors from the questionnaires also did not yield significant relationships between attributions and adjustment. Only one correlation was significant: Attributions to a "specific stressor" were significantly associated with worse adjustment ($r = -.32$, $p < .02$). Unfortunately, the category, specific stressor, was itself unspecified, and so its meaning was idiosyncratic to each woman who rated it as important. Hence, the correlation is not especially informative; moreover, it might be significant by chance due to the large number of attribution analyses.

Next, we examined responsibility attributions (self, other, environment, or chance). We calculated the reliability between the interview question assessing responsibility and the questionnaire item in which respondents rated the importance of the four responsibility factors. The responsibility attribution reported in the interview was the same as the responsibility item given the highest rating on the questionnaire in 70% of the cases, with reliability across interviewers ranging from 61% to 78%. There were no significant differences across interviewers in frequency of responsibility attributions to the four factors. Using the interview item, 41% of the sample blamed themselves, 10% blamed another person, 28% blamed the environment, and 49% blamed chance. Again, the numbers exceed 100% because a number of people attributed responsibility to more than one factor, despite the forced-choice format. Responses to each of the four factors were then coded yes–no, and t tests assessed whether attribution to that factor was associated with good or poor adjustment. None of the tests was significant. When the more sensitive 5-point responsibility scales in the questionnaire were used, however, blaming another person was found to be associated with poorer adjustment ($r = -.29$, $p < .03$); the correlation was reduced only slightly ($r = -.24$) when prognosis was partialed out. This result replicates Bulman and Wortman's (1977) finding that blaming another person for one's disorder is associated with poor coping.

Previous research (Bulman & Wortman, 1977) had found that self-blame was associated with successful coping because it signified control; other research, in contrast, had suggested that self-blame produces guilt and self-recrimination (e.g., Abrams & Finesinger, 1953). Since we found no simple relation between self-blame and adjustment, we reasoned that self-blame may have multiple meanings, signifying control and good adjustment for some people and guilt and poor adjustment for others. In order to test this possibility, respondents' questionnaire ratings of their own responsibility for the cause of the cancer were split at the median, as were the ratings of perceived control by the self over the course of the cancer. We then created four groups by crossing responsibility and control. Following the previous reasoning, we predicted that the high responsibility–high control group would be the best adjusted and the high responsibility–low control group would be the worst adjusted, with the other two groups falling in between. A two-way analysis of variance (ANOVA) on adjustment scores was performed, and an interaction of responsibility and control was predicted. Results did not correspond to prediction. Although belief in own control over the cancer was associated with better adjustment, $F(1, 65) = 4.81$, $p < .04$, the responsibility main effect and more importantly, the interaction were not significant.

Next, tests were conducted to determine if particular attributions are more likely at different times since surgery. Bulman and Wortman (1977) had suggested that self-blame for one's disorder or problem may be a relatively late-occurring attribution in the adjustment process. We created three equal-n time-since-surgery blocks, and questionnaire ratings of the causal importances of the self, of another person, of the environment, and of chance were the dependent measures. The four one-way ANOVAs showed no significant effects. Next, to see if self-blame is adaptive only when one is farther away from an aversive event, as Bulman and Wortman found, we examined the correlations between self-blame and adjustment for each of the three time periods. Results indicated that self-blame and adjustment were slightly negatively correlated in the early time period (2–17 months; $r = -.24$, $p < .15$) and in the farthest time period since surgery (more

than 36 months; $r = -.16$, $p < .26$); however, in the middle time period (17–36 months) after surgery), self-blame and adjustment were strongly positively correlated ($r = .43$, $p < .04$). This result suggests that self-blame may be adaptive at some times and not others.

Psychological Control

We next examined respondents' beliefs in control over the course of cancer. Of the sample, 56% felt they personally had some or a lot of control, whereas 49% felt they had little or no control; there were no significant differences as a function of interviewer in frequency of belief in own control. To the open-ended question (In what way do you have control?), 51% of those who said they had control indicated that changes in their attitude (e.g., taking things more easily, not getting upset) or changes they had made in their life (e.g., dietary changes) gave them control. Forty-six percent indicated that their compliance with medical regimen gave them control. Belief that others can control the cancer was also fairly strong (68% said somewhat or a lot and 32% said little or not at all). Again, there were no differences in perceived control by another as a function of interviewer. For 78% of those who said somewhat or a lot, this other factor was the physician or treatments; for 10%, the someone else was usually God or a therapist; 12% did not specify the factor.

In order to assess the effects of beliefs in control on adjustment, beliefs in own control and in others' control were split at the median, and we then created four groups by crossing the two variables. A two-way ANOVA was performed with the two types of control as independent factors and adjustment score as the dependent variable. Means are presented in Table 1. Both main effects, but not the interaction, were significant, indicating that belief in one's own control, $F(1, 68) = 6.03$, $p < .02$, and in others' control $F(1, 68) = 4.10$, $p < .05$, were both independently associated with adjustment.[5] The relations between beliefs in own control and adjustment and between belief in others' control and adjustment are unchanged when one controls for prognosis and for socioeconomic status (operationalized as education).

Table 1: *Effects on Adjustment of Beliefs About Own and Others' Control Over One's Cancer*

Own control over cancer	Others' control over cancer: High	Others' control over cancer: Low
High	0.37 ($N = 29$)	−0.23 ($N = 11$)
Low	−0.13 ($N = 20$)	−0.62 ($N = 12$)

Note. Table entries are standardized adjustment factor scores with higher numbers indicating better psychological adjustment.

The present study afforded an opportunity to examine the effects of different types of control on adjustment, albeit in fairly rough fashion. Information control, which is usually operationalized as manipulated information provided to subjects, was here operationalized as the respondent's cancer-related information-seeking behavior (contacts with media, books, other cancer patients, etc.). Information control was not significantly related to good adjustment. Examination of the data revealed that information bore a (nonsignificant) curvilinear relationship to adjustment, such that those with moderate information-seeking behavior were somewhat better adjusted.

Cognitive control is usually manipulated by instructing subjects how to think about an aversive event differently. Our respondents had been asked if they had made any changes in their lives since the cancer, and a large number (70%) reported that cancer had made them think about their lives differently. For most, this change was positive (60% of those who reported changes), and most commonly the reported change concerned learning to take life more easily and to enjoy it more. These changes may be thought of as a rough approximation of cognitive control, and they were significantly related to adjustment in a positive way ($F(2, 67) = 4.09$, $p < .03$).

Behavior control was operationalized crudely as the health-related behavioral changes respondents had made in their lives since cancer. Regarding respondents' reports

[5] Belief in own control is equally strongly associated with adjustment, regardless of whether one sees one's own direct efforts as the controlling response or whether one regards one's compliance with medical regimen as the controlling response.

of total change, 22% had made no changes at all, 55% had made one or two usually small changes, and only 23% had made three or more changes. Changes in diet were fairly common (49%) but were unassociated with adjustment ($F < 1$). Change in exercise patterns was also relatively common (26% increased, 54% made no change, and 18% decreased) and was significantly related to adjustment, such that more exercise was better ($r = -.23$, $p < .03$). Taking increased time for leisure activities was also significantly correlated with adjustment ($r = .26$, $p < .02$). (Both effects continue to be significant with prognosis partialed out.) Eighteen percent of the sample had tried to find a new way of managing their lives, and 48% had tried techniques on their own for coping with day-to-day stress, but neither of these efforts was associated with adjustment (both Fs < 1). The other specific behavior changes inquired about in the interview had frequencies too low to make statistical analyses meaningful. Thus the effects of behavior control, at least as operationalized through health-related behavior changes since cancer, were variable.

Next, the effects of retrospective control were examined. Usually, retrospective control is operationalized as taking responsibility for the cause of an aversive event; it has already been noted that attributing the cause of one's cancer to the self bears no relationship to adjustment. Respondents had also been asked if they could have controlled the cause of their cancer had they foreseen it, if someone else could have controlled it had they foreseen it, and if they should have done something sooner to control the cancer. None of the responses to these questions significantly predicted adjustment. Thus in the present sample it appears that retrospective control efforts are neither adaptive nor maladaptive.

Discussion

Attributions and Adjustment

Overall, the ability of attribution theory to explain aspects of the cancer adjustment process was mixed. On the one hand, cancer patients do make attributions for their cancer. The attribution process, however, does not seem to be important early on in the illness adjustment process, although it may become important to some women during recovery and even later. A possible reason for this temporal pattern is that early on in a cancer bout, one's time and attention are occupied by the details of medical care such as surgery decisions and by emotional reactions such as intense fear or denial. Perhaps these initial fears and concerns must pass before there is the luxury of time and attention to be devoted to causal attributions. Nonetheless, it is clear that only a minority of patients rated having a causal attribution as important to them. This fact seems surprising in light of the contention by attribution theorists that a causal attribution is essential to understanding, explaining, and controlling an aversive event. We will return to this point shortly.

Perhaps most surprising was the fact that no particular attribution for cancer was tied to good psychological functioning. Moreover, attributions of responsibility to the self, the environment, or chance showed no relationship to adjustment. Only blame of another person was significantly related to poor adjustment, a result that replicates a finding by Bulman and Wortman (1977). They conjectured that blame of another person may be tied to unresolved anger and distress. In our sample, such anger appeared to be aimed either at one's physician for failing to give the right treatment at the right time or at one's (ex)spouse for creating the stress that produced the cancer.

Our study also sought to resolve the contradictory predictions regarding self-blame for cancer—namely, whether such attributions are associated with good (e.g., Bulman & Wortman, 1977) or poor (e.g., Abrams & Finesinger, 1953) adjustment. Neither prediction was supported. Self-blame bore no relation to adjustment, and an internal analysis crossing self-blame and control also failed to support either set of predictions. Several recent studies of victims of violence and physical disability have now also failed to find a relation between self-blame and adjustment (Miller & Porter, in press; Silver, 1982), and so it would seem appropriate to conclude that self-blame, at least for some negative events, is neither adaptive nor maladaptive.

Overall, why were attributions generally unrelated to adjustment? Two important possibilities come to mind: First, the psychological significance of attributions may be diluted by background and knowledge factors having nothing to do with psychological adaptiveness. Thus, for example, Meyerowitz's (May 18, 1980, personal communication) heavily Catholic, lower socioeconomic class sample frequently attributed cancer to God's will, whereas our more heavily Jewish and upper middle class sample rarely did. Our respondents showed a fair amount of knowledge about cancer, citing carcinogens, dietary factors, and medications as causes, based on articles they had read; thus, their educational level clearly affected their attributional content. The general point is that attributions and their particular content reflect more than psychological meaning; they are also clearly tied to knowledge about the disease and cultural and social factors that make certain kinds of explanations more likely (see, for example, Comaroff, 1980; Good & Good, 1980).

A second possible reason why attributions were unrelated to adjustment is that they may have not reflected the needs attributions are usually thought to serve. That is, attributions are thought to be important in adjusting to stressful events because they create understanding, predictability, and control. It is possible that in the present study these needs were met through cognitions other than causal attributions. The empirical results on psychological control suggest that this may be so.

Psychological Control and Adjustment

Overall, the association between beliefs in psychological control and adjustment was strong. Both the perception that one can control one's own cancer and the perception that others can control it were significantly related to adjustment and uncorrelated with each other. Research on psychological control has typically examined the impact of manipulated feelings of control on adjustment to short-term aversive events. The present results indicate that self-generated feelings of control over a chronic situation are associated with the same beneficial effect.

Perceived control by another was highly correlated with adjustment as was belief in self-control. This finding contradicts previous research (see Thompson, 1981) that suggested the greater importance of own versus other control. However, the strong belief in others' control is understandable in the case of cancer, since cancer's control by the physician and by treatment is far better documented than its control by the patient.

The present study also afforded an opportunity to examine the impact of different types of control on adjustment as identified in Thompson's (1981) theoretical review. Cognitive control, operationalized as construing benefit from the cancer experience, significantly predicted adjustment, a finding that parallels experimental research on cognitive control. However, our operationalization of cognitive control is questionable. Cognitive control is usually operationalized by modifying a stimulus through thought *as it is occurring.* Altering its meaning *after the fact,* our operationalization, has been construed by some as secondary control (Rothbaum, Weisz, & Snyder, 1981), which may be a fallback form of control. Rothbaum et al. (1981) imply that construing meaning from an experience may be especially adaptive when direct control is unlikely. In the present study, the adaptiveness of construing meaning was evident, consistent with Rothbaum et al.'s (1981) reasoning.

Information control, operationalized as cancer-related information-seeking behavior, showed a nonsignificant curvilinear relation to adjustment. Thompson (1981) has suggested that information in the absence of direct control possibilities may provide little benefit. In our own sample, it is possible that too much reading about cancer made respondents only more frightened of the possibility of recurrence by keeping cancer on their minds without providing them with a direct controlling response.

Behavior control, operationalized as health-related behavior changes since cancer, had mixed effects on adjustment. Increases in exercise and increases in leisure time were associated with positive adjustment, but changes in diet and stress management were not. However, increases in exercise and leisure time may have a direct relation with adjustment that is unmediated by any feelings of control that are aroused. Thus, no conclusions about the efficacy of behavioral control can be drawn for this sample.

Finally, the effects of retrospective control were examined and were found to be unassociated with adjustment. Previous work, scanty though it is (Thompson, 1981), had found no consistent effect for retrospective control. This fact—that belief in past but unsuccessful control is not associated with adjustment—is potentially important. Although it is difficult to interpret such retrospections unambiguously, one possible interpretation is that the failure to exert control successfully over a threatening event may not be as psychologically devastating as some have suggested (see, e.g., Seligman, 1975; Wortman & Brehm, 1975). If this interpretation is correct, control theorists' concerns that failed efforts at control are worse than no control at all may be misplaced (Taylor, 1983). This analysis is extremely speculative, however, and requires empirical investigation.

Earlier, we suggested that attributions may have failed to predict adjustment, because they did not fill their usual functions of providing understanding, predictability, and control. In the context of the results on control, this possibility seems quite likely. Efforts to find meaning in the cancer experience seemed to be reflected more in respondents' changes in their attitudes toward life than in their attributional explanations for cancer (see Taylor, 1983; Taylor, Wood, & Lichtman, in press). Similarly, needs for predictability and control may have been met more by beliefs about control than by attributions. How do we reconcile this line of thinking with previous research showing that attributions do predict adjustment to crisis (Bulman & Wortman, 1977)? It may be the case that, for a discrete event that cannot now be undone, but that also will not recur (e.g., a spinal cord injury discussed by Bulman & Wortman, 1977), attributions are an important way of finding meaning and a sense of control; however, for a continuing threat such as cancer, finding the reasons for its occurrence may be less important than finding a way to modify its course *now*. Hence the effort to find meaning and control may shift to factors that are currently controllable (cf. Wong & Weiner, 1981). This point supports the view that although the needs for meaning and control may themselves be robust, the specific cognitions through which they are met may vary, depending upon the parameters of the situation (see Taylor, 1983).

Given the apparent benefits of psychological control, should cancer patients be encouraged to try to assert control over their cancer? Unfortunately, the answer must be equivocal. Some (e.g., Abramson, Seligman, & Teasdale, 1978; Wortman & Brehm, 1975) have maintained that if one attempts to exert control and is unsuccessful, the resulting effects on motivation, behavior, and emotions can be worse than if no attempt at control was made. Taylor (1983), however, has challenged these conclusions, arguing that the maladaptive effects of failed control efforts have been demonstrated only in closed environments with no behavioral options; when options exist, she argued, efforts at control may simply shift from unsuccessful to new responses. However, the controversy currently remains at a theoretical level and cannot yet be resolved definitively.

Qualifications Regarding Findings

Some attention to the limitations of this study merit comment. First, the sample has a somewhat disproportionately Jewish representation and is heavily middle to upper class. Interestingly enough, the breast cancer population is itself biased in these ways (see Kushner, 1975), although not to the same degree as is our sample. It is hard to know how the religious skew might affect our conclusions, although research on the cultural responses to illness clearly shows that ethnic and religious factors are important (e.g., Zborowski, 1958; Zola, 1966). The socioeconomic status skew is somewhat more easily addressed. A sample with lower socioeconomic status might be more concerned with practical difficulties such as loss of work and money and would perhaps be less concerned with more ethereal problems like attributions for cancer and the meaning of life; impressions from our own interview results support this possibility. However, our analyses that controlled for either socioeconomic status (education) or religion, or for both, showed that our important conclusions, such as the association between control and adjustment, were unqualified by these factors.

A second limitation of the study is that it is neither experimental nor longitudinal, making it difficult to venture causal statements. We have tried to qualify our inferences ac-

cordingly, but it is clear that definitive answers to many of the issues we have raised will require a longitudinal approach (cf. Lichtman, Taylor, & Wood, in press). For example, are well-adjusted people more likely to perceive that they have control in a situation such as breast cancer, or do feelings of control produce good adjustment? Are well-adjusted people more able to find meaning in a crisis such as cancer, or does one become better adjusted by finding meaning?

A third potential limitation of the study is the role of self-reporting biases such as social desirability. We are inclined to discount this problem due to the substantial amount of highly personal, negative disclosure that occurred during the interviews. Nonetheless, many of the respondents represented themselves as coping very well. One must ask, however, for whom this desirable self-presentation is made. Our suspicion is that respondents' desires to appear well-adjusted are more for their own psychological benefit than for ours (Taylor, Wood, & Lichtman, in press).

Something also should be said about the potential for interviewer bias. Although respondents indicated their own responses on each scaled item, bias may have intruded in the way questions were asked that would lend support for the hypotheses. We believe such problems are minimal for several reasons: First, items assessing attributions and control were asked in the first few minutes of the interview, before the interviewer could have assessed the adjustment of the patient. Second, only three of the five interviewers were aware of the hypotheses, and interviewer differences across questions were minimal. Third, the adjustment score consists of six measures, only one of which is an interviewer rating. Finally, the results by no means supported all of the authors' own hypotheses.

Conclusions

In conclusion, we would stress the importance of studying social cognitions in nonlaboratory settings involving events of real consequence for people's lives. When one does so, some laboratory-based results may be qualified in important ways, suggesting parameters that should be integrated into existing theories. For example, although beliefs in personal control were correlated with adjustment as has been found in laboratory research, so were beliefs in vicarious control, a finding that runs counter to laboratory results. The discrepancy suggests the need to focus on the actual (e.g., physical) benefits of a controlling response, and not just its psychological benefit. Also, attributions do not appear to be functionally important for the adjustment of this population, a finding that runs counter to most theories of attributions. It has been suggested that distinguishing between events that are ongoing versus those that are not may distinguish when attributions do or do not have functional significance.

Despite the contradictions between laboratory-based predictions and the present results, parallels must also be noted. The ubiquitous appearance of attributions in this population and the strong relation between control and adjustment clearly indicate that social psychological emphasis on attributions and control is well-placed. Laboratory and field research, in concert, will further elucidate the impact of these variables on adjustment.

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