Dispositional Pessimism Predicts Illness-Related Disruption of Social and Recreational Activities Among Breast Cancer Patients

Charles S. Carver, Jessica M. Lehman, and Michael H. Antoni
University of Miami

The authors tested whether dispositional pessimism would predict withdrawal from social activities among women treated for breast cancer. In a cross-sectional sample 3–12 months postsurgery, disruption of social and recreational activities (measured by the Sickness Impact Profile) correlated with concurrently assessed pessimism. This association appeared mediated by emotional distress and fatigue. A longitudinal sample was studied shortly postsurgery and over the next year. Initial pessimism predicted disruption of social activities concurrently and prospectively (3, 6, and 12 months later) but predicted change in disruption from one time to the next only at final follow-up. These associations appeared partially mediated by distress. The authors conclude that pessimism places patients at risk for adverse outcomes in several respects rather than solely with regard to emotional distress.

Individual differences in dispositional optimism versus pessimism about one's future, assessed as generalized expectancies, have been the subject of a great deal of research over a period of nearly 2 decades (for reviews see, e.g., Carver & Scheier, 2001; Scheier, Carver, & Bridges, 2001). Much of that research has focused on differences in psychological well-being: more specifically, the role that this personality dimension plays in the subjective emotional reactions that people have when they confront difficulties or stresses in their lives.

The range of stressors involved in that research is very broad. Studies have examined the experiences of students entering college (Aspinwall & Taylor, 1992; Brissette, Scheier, & Carver, 2002), employees of businesses (Long, 1993), survivors of missile attacks (Zeidner & Hammer, 1992), and caregivers of medical patients (Given et al., 1993; Hooker, Monahan, Shifren, & Hutchinson, 1992; Shifren & Hooker, 1995). Other studies have focused on people dealing with medical procedures such as childbirth (Carver & Gaines, 1987; Park, Moore, Turner, & Adler, 1997), abortion (Cozzarelli, 1993), coronary artery bypass surgery (Fitzgerald, Tennen, Affleck, & Pransky, 1993; Scheier et al., 1989), attempts at in vitro fertilization (Litt, Tennen, Affleck, & Klock, 1992), and bone marrow transplantation (Curbow, Somerfield, Baker, Wingard, & Legro, 1993). Research has examined how people deal with a cancer diagnosis (Carver et al., 1993; Friedman et al., 1992; Stanton & Snider, 1993) and the progression of AIDS (Taylor et al., 1992). Nor does this list exhaust the range of stressors examined in research on this topic (see Scheier et al., 2001). As a whole, this work supports the conclusion that optimists confronting such difficulties experience less distress than do pessimists in comparable situations.

As noted, much of the literature on the effects of optimism deals with emotional adjustment. This is somewhat ironic, in light of this literature's conceptual underpinnings (Scheier & Carver, 1985). That is, this view of the optimism–pessimism dimension has its roots in an expectancy-value model of motivation.[1] Favorable expectations for the future are believed to lead to continued engagement in life's activities or pursuit of desired incentives. Unfavorable expectations for the future are believed to lead to with-

Charles S. Carver, Jessica M. Lehman, and Michael H. Antoni, Department of Psychology, University of Miami.

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Correspondence concerning this article should be addressed to Charles S. Carver, Department of Psychology, University of Miami, Coral Gables, Florida 33124-2070. E-mail: ccarver@miami.edu

[1] Questions have been raised about whether optimism–pessimism should be thought of as a single bipolar dimension or as two separate dimensions (e.g., Marshall, Wortman, Kusulas, Hervig, & Vickers, 1992), in part because the Life Orientation Test, Scheier and Carver's (1985) optimism measure, separates into two factors (defined by optimistic vs. pessimistic item phrasing) that often are not strongly correlated. This issue became less salient with the scale's revision (Scheier, Carver, & Bridges, 1994), because the revised version displays less separation between item subsets. We conducted subsidiary analyses to test the separate predictive effects of the item subsets in the research reported here. In general, both subsets predicted relevant outcomes; effects for the negatively worded items tended to be stronger than effects for the positively worded items, but the differences in prediction tended not to be very large. For this reason, throughout this discussion we treat optimism–pessimism as a single bipolar dimension.

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drawal from those activities and incentives (see, e.g., Carver & Scheier, 1998). Although predictions about emotions can clearly be derived from this theoretical viewpoint, its central focus is on behavior. It is ironic, then, that the existing literature on optimism does not hold a great deal of evidence that this dimension predicts differences in engagement in versus withdrawal from life's activities.

Several findings do address this issue, though some of the evidence is tangential. Many of the findings concern the extent to which people report striving to master stressful events. A number of studies have shown that optimists report more active, problem-focused coping responses than do pessimists in dealing with various stressors (e.g., Aspinwall & Taylor, 1992; Scheier, Weintraub, & Carver, 1986; Strutton & Lumpkin, 1992). Several further studies, focusing on health promotion as a goal, have found similar effects. One study found that optimistic heart patients increased their exercise more in a cardiac rehabilitation program than did pessimists (Shepperd, Maroto, & Pbert, 1996). Two other projects found that optimists engage in diverse health-promoting behaviors more than do pessimists (Robbins, Spence, & Clark, 1991; Steptoe et al., 1994).

There is also a good deal of evidence that links pessimism to avoidant or escapist coping when confronting stress (Aspinwall & Taylor, 1992; Epping-Jordan et al., 1999; Litt et al., 1992; Segerstrom, Taylor, Kemeny, & Fahey, 1998; Stanton & Snider, 1993; Strutton & Lumpkin, 1992). There is some ambiguity, however, as to whether this represents withdrawal from life's activities or simply an avoidance of the stressor. Less ambiguous is the link between pessimism and reports of an impulse to give up goals that are being threatened (Carver et al, 1993). Of perhaps clearest relevance to the issue, pessimism has been linked to the ultimate withdrawal from life's activities—suicide (Beck, Steer, Beck, & Newman, 1993; Beck, Steer, Kovacs, & Garrison, 1985; Fawcett et al., 1987; Petrie & Chamberlain, 1983).

The purpose of the research reported here was to examine the possibility that pessimism would be linked to a kind of withdrawal that is more subtle but still important. Specifically, we examine withdrawal from normal social activities among recently treated cancer patients.

Adaptation to Breast Cancer

Diagnosis and treatment of breast cancer, though not as traumatic as it once was, remains the source of much distress and life disruption (e.g., Glanz & Lerman, 1992; Irvine, Brown, Crooks, Roberts, & Browne, 1991; Moyer & Salovey, 1996). Research on the psychosocial effects of these experiences focused initially on overall profiles of distress and recovery over time (e.g., Lansky et al., 1985; Penman et al., 1987; Psychological Aspects of Breast Cancer Study Group, 1987). More recently, attention turned to variables that render some women more vulnerable to poor psychosocial adjustment than other women.

One such variable is the personality dimension of optimism versus pessimism. Several studies have now shown that women who are more optimistic about life have less negative emotional outcomes from diagnosis and treatment of breast cancer than do women who are more pessimistic (e.g., Carver et al., 1993; Epping-Jordan et al., 1999; Stanton & Snider, 1993). These findings are consistent with the broader literature, overviewed earlier, showing that optimists experience better emotional outcomes than do pessimists when confronting adversity.

Emotional well-being, however, is not the only important psychosocial outcome for medical patients. Another important aspect of adjustment to illness is remaining engaged in life's normal activities after diagnosis and treatment. If the illness or its treatment disrupts social activities too much, the patients may become isolated from their social networks. This can produce further adverse effects (Bloom & Spiegel, 1984; Williamson, 2000; for discussions of this issue with respect to rheumatoid arthritis, see Brown, Nicassio, & Wallston, 1989; Smith & Wallston, 1992, 1996; Smith, Wallston, Dwyer, & Dowdy, 1997). This variable—illness-related disruption in normal social activities—was the focus of the analyses reported here. To assess illness-related disruptions, we used two subscales of the Sickness Impact Profile (SIP; Bergner, Bobbitt, Carter, & Gilson, 1981) bearing on social activities and recreational pastimes. We tested the hypothesis that pessimism would predict experience of these disruptions among breast cancer patients.

Because of existing evidence regarding optimism and emotional well-being, we examined the possibility that emotional distress might lie behind any withdrawal tendencies that were observed. We also conducted exploratory analyses to examine the role of fatigue in these effects. Persistent fatigue is a common experience of cancer patients (Berger, Portenoy, & Weissman, 2002; Vogelzang et al., 1997). This fatigue has many sources, including the surgery itself, adjuvant treatment, sleep problems, pain, and emotional distress (Piper, Lindsey, & Dodd, 1991; Berger et al., 2002; Smets, Garssen, Schuster-Uitterhoeve, & de Haes, 1993; Winningham et al., 1994). We assessed whether greater pessimism was related to greater fatigue and whether this relationship might play a role in withdrawal from social activities. These questions were examined in two independent samples of women who were actively being treated (or had very recently been treated) for breast cancer.

Study 1

Method

Participants and Procedures

Participants in the first study were 235 breast cancer patients, recruited through several Miami area practices.[2] Recruitment typically began with a letter from the woman's physician introducing the study (though this was sometimes done in an office visit). With the letter was a more concrete description of what participation would entail. Interested patients returned a form to initiate phone contact. Female graduate students called, explained the study in more detail, assessed eligibility (exclusion criteria were positive psychiatric history, prior cancer, or major concurrent disease), and mailed all who wished to participate a packet containing an informed consent form and a packet of questionnaires. Each participant was paid $40 on return of the packet. The final participation rate of women initially contacted by mail was approximately 80%.

The project from which these data were drawn tested for potential differences across time since surgery (for reasons unrelated to this report).

[2] This data set overlaps greatly with that used in analyses reported by Spencer et al. (1999) and Carver, Meyer, and Antoni (2000). However, neither of those articles concerned effects of optimism.

Thus, participants were recruited at either 3 months ($n = 69$), 6 months ($n = 74$), or 12 months ($n = 92$) postsurgery. Because time since surgery had no effect in the findings reported here, it is not mentioned further.

The women in this study ranged in age from 27 to 87 years ($M = 53.59$ years, $SD = 12.41$ years). They averaged 14.25 years of education ($SD = 2.87$ years); 123 were employed full-time ($n = 102$) or part-time. Most of the sample were married ($n = 165$), 29 were divorced or separated, 27 were widowed, and 14 were single. Ethnicity was as follows: Black ($n = 26$), Hispanic ($n = 60$), and non-Hispanic White ($n = 149$). The women had been diagnosed with Stage 0 ($n = 10$), Stage I ($n = 135$), or Stage II ($n = 90$) breast cancer (women with more advanced cancers were not contacted by letter). Positive nodes ranged from 0 to 21 ($M = 0.84$, $SD = 2.61$). Most were treated by lumpectomy ($n = 138$), but 97 were treated by mastectomy; 89 received chemotherapy, 141 received radiation, and 89 received tamoxifen, an estrogen blocking agent (these were nonmutually exclusive groups).

Measures

Optimism–pessimism. The personality disposition of optimism versus pessimism was assessed by the Life Orientation Test—Revised (LOT–R; Scheier, Carver, & Bridges, 1994). The LOT–R, a more focused and briefer version of the LOT (Scheier & Carver, 1985), is a six-item scale (plus three filler items) that yields a continuous distribution of scores. Example items are "In uncertain times, I usually expect the best," and "If something can go wrong for me, it will." The response choices in this study ranged from *I agree a lot* (1) to *I disagree a lot* (4), with no neutral response. Responses are scored such that higher scores represent greater optimism. Alpha in this sample was .75. LOT–R scores ranged from 6 to 24 ($M = 19.75$, $SD = 3.65$).

Social disruption. Two subscales of the SIP (Bergner et al., 1981) were used to measure the adverse impact of breast cancer and its treatment on social and recreational behavior. The full SIP, with 12 areas of impact, has been validated on a variety of patient groups (Bergner et al., 1981). The scales used here assessed impact on *social* activities and on *recreation and pastime* activities. Participants were asked to report on any recent disruption in these activities that occurred because of their illness and its treatment. Examples of items reflecting adverse impact on social activities are "I am avoiding social visits from others," "I am going out less to visit people," "I isolate myself as much as I can from the rest of the family," "I talk less with those around me," and "I show less interest in other people's problems, for example, don't listen when they tell me about their problems, don't offer to help." Examples of items reflecting adverse impact on recreational activities are "I am cutting down on some of my usual recreation and pastimes, for example, watching TV or reading," "I am going out for entertainment less often," and "I am doing fewer community activities, for example, going to church or doing volunteer work."

Responses are scored such that higher scores represent greater disruption (scores are computed by a weighted formula; Bergner et al., 1981). Alpha among raw responses was .86 for the Social Interaction subscale and .70 for the Recreation and Pastimes subscale. As the two subscales were strongly correlated ($r = .70$, $p < .001$), we created a *social disruption* index by standardizing the subscale scores and averaging them.

Emotional distress. Emotional distress was assessed with brief sets of descriptive adjectives. Respondents indicated the degree to which they had experienced each feeling "during the past week including today." Response options ranged from *not at all* (1) to *extremely* (5). These scales were used in earlier breast cancer research by Carver et al. (1993). Distress was measured here as anxiety (*tense*, *nervous*, and *anxious*; $\alpha = .87$), depression (*helpless*, *unhappy*, *worthless*, and *hopeless*; $\alpha = .80$), and anger (*angry*, *resentful*, and *grouchy*; $\alpha = .78$). In a sample of 235 students, these brief scales correlated .87, .93, and .87, respectively, with the comparable scales from the Profile of Mood States (POMS; McNair, Lorr, & Droppelman, 1971). Because these scales were also strongly interrelated, we created a single distress index from all 10 items by averaging responses (thus placing distress scores on the metric of the response options). This distress index correlated .43 with the index of social disruption derived from the SIP.

Fatigue. Fatigue was assessed by three descriptors from the Fatigue scale of the POMS (McNair et al., 1971). Respondents indicated the extent to which they had had the feelings expressed by those descriptors (*tired*, *worn out*, and *exhausted*) during the past week, using the same response choices as were used for the distress items. Responses were averaged across items ($\alpha = .90$). Fatigue correlated .48 with the index of social disruption and .55 with the index of emotional distress.

Results

Testing for Control Variables

We first examined the data to assess the possible need for control variables. We did this by relating demographic variables (age, education, ethnicity, employment status, martial status) and medical variables (cancer stage, number of positive lymph nodes, type of procedure, time since surgery, chemotherapy status, radiation status, and tamoxifen status) to the predictor variable optimism. LOT–R scores proved not to relate significantly to any of these variables.

Previous analyses on a data set that overlaps quite substantially with this one (see Footnote 1) had found ethnic differences in both social disruption and emotional distress (Spencer et al., 1999). To account for the variance known to be attributable to these effects, we incorporated ethnicity into the analyses reported here, in the form of two dummy variables (one coding non-Hispanic Whites as -1, Hispanics as 0, and African Americans as 1; the second coding non-Hispanic Whites as -1, African Americans as 0, and Hispanics as 1).

We also tested whether medical variables (e.g., chemotherapy or radiation) related to social disruption. If so, their effects would provide an interesting point of comparison with the effects of optimism. However, in this sample none of these variables related significantly to social disruption.

Relations of Optimism to Social Disruption and Proposed Mediators

Prediction of the SIP index of social disruption from participants' levels of optimism was assessed by multiple regression analysis, in which the ethnicity dummy variables and LOT–R scores were entered. The resulting model accounted for 14.1% of the total variance (adjusted R^2), $F(3, 231) = 13.80$, $p < .001$. As predicted, optimism related inversely to social disruption ($\beta = -.25$), $t(231) = 4.16$, $p < .001$. In addition, Hispanic women reported more social disruption than did non-Hispanic White women ($\beta = .33$), $t(231) = 3.63$, $p < .001$.

Similar analyses confirmed that optimism also related to emotional distress and to fatigue. For distress, the overall model accounted for 22% of the total variance (adjusted R^2), $F(3, 231) = 28.56$, $p < .0001$. Optimism related inversely to distress ($\beta = -.41$), $t(231) = 6.97$, $p < .001$. Further, Hispanic women reported more distress than did non-Hispanic White women ($\beta = .31$), $t(231) = 3.62$, $p < .001$, and Black women reported less distress than did non-Hispanic White women ($\beta = -.22$), $t(231) = 2.63$, $p < .01$. For fatigue, the overall model accounted for 10.1% of the total variance (adjusted R^2), $F(3, 231) = 9.80$,

$p < .001$. Optimism related inversely to fatigue ($\beta = -.29$), $t(231) = 4.59$, $p < .001$. Hispanic women reported more fatigue than did non-Hispanic White women ($\beta = .21$), $t(231) = 2.33$, $p < .03$, and Black women reported less fatigue than did non-Hispanic White women ($\beta = -.19$), $t(231) = 2.05$, $p < .05$.

Finally, we tested for patterns that would be consistent with mediation. First we examined whether the predictive effect of optimism on social disruption might be mediated by emotional distress, fatigue, or both. We did this by repeating the analysis of optimism as a predictor (already described) and entering a hypothesized mediator on a second step. Entry of fatigue in this manner yielded a significant effect for fatigue ($\beta = .42$), $t(230) = 7.12$, $p < .001$, and a reduction in the effect of optimism from $\beta = -.25$ to $\beta = -.14$. The latter remained significant, however, $t(230) = 2.34$, $p < .03$. A similar analysis entering distress yielded a significant effect for distress ($\beta = .34$), $t(230) = 5.17$, $p < .001$, and a reduction in the effect of optimism from $\beta = -.25$ to $\beta = -.12$, which was still marginally significant, $t(230) = 1.84$, $p < .07$. When distress and fatigue were entered simultaneously, both made significant contributions to predicting social disruption, but the effect of optimism no longer approached significance ($\beta = -.09$, $p > .14$). This pattern is consistent with mediation of the pessimism effect by the ties of pessimism to distress and fatigue.

Analyses were also conducted to examine the possibility that prediction of fatigue and distress by optimism might be mediated by differential social disruption. We tested this possibility by entering social disruption into regression equations after entry of LOT–R scores. In both cases, social disruption contributed to prediction of the dependent variable ($\beta = .44$ for fatigue, and $\beta = .31$ for distress). In neither case, however, did the inclusion of social disruption greatly weaken the effect of optimism.

Discussion

Participants in this study were women who had been treated for breast cancer within the previous year. All had undergone surgery, and many had also experienced the effects of adjuvant treatment in the form of chemotherapy or radiation. These adverse experiences led to a certain amount of disruption in the daily activities that normally formed a part of these women's lives. The focus of the analyses reported here is on whether the personality disposition of optimism versus pessimism predicts the extent to which these disruptions occurred. The data reveal that women who were more pessimistic about their lives in general reported more illness-related disruption in their social and recreational activities than did less pessimistic women. These effects did not depend on medical variables, because those variables were not related to optimism.

The finding that pessimism was related to greater social disruption in breast cancer patients joins previous findings that pessimism leads to greater emotional distress in breast cancer patients (Carver et al., 1993; Stanton & Snider, 1993). This naturally raises the question of whether the effects are linked. That is, perhaps cancer patients withdraw from recreational activities and social contacts to the extent that they are experiencing emotional distress. Because pessimistic women had more intense distress, they may thus have displayed more withdrawal from these activities of daily life. Also considered was the possibility that pessimism may have led to greater fatigue and that fatigue may have been a contributor to illness-related disruption of such activities. The data lend support to both of these hypotheses. Distress and fatigue both related to pessimism and to social disruption, and the inclusion of these variables in the predictive equation essentially eliminated the effect of pessimism.

Study 2

Study 1 is useful, but it has an important limitation: Its design is cross-sectional. The disposition of optimism versus pessimism was assessed at the same time as was social disruption. Though optimism is known to be a relatively stable characteristic (Scheier & Carver, 1992), it is possible that women's reports of optimism were influenced by social disruption rather than vice versa. In part for this reason, we turned to another sample, from a study with a different design. This study also examined early stage breast cancer patients, but they were recruited shortly after diagnosis and treatment and then followed for a year (during which they were reassessed on three more occasions). The measure of optimism from the initial assessment was used to predict illness-related disruption of social and recreational activities both concurrently and during the subsequent year. As in Study 1, we examine the question of whether any link between pessimism and illness-related disruption that emerged would be mediated by emotional distress or fatigue.

Method

Participants

Participants in Study 2 were breast cancer patients from several Miami area practices.[3] In most cases, they responded to a letter from their physician soliciting their participation; others were recruited through flyers distributed by the American Cancer Society. In contrast to Study 1, Study 2 examined the experiences of newly diagnosed patients. Specifically, participation in this study required that the cancer diagnosis have occurred within the past 8 weeks.

The study was described to all those contacted as a project on the effects of stress management training on experiences of women undergoing treatment for breast cancer. Those interested called the project's phone number and spoke with a (female) researcher who screened them for eligibility (as in Study 1, exclusionary criteria were previous cancer, psychiatric history, and major concurrent illness). Information on staging and date of surgery was also obtained at this time. Of the women contacted by letter, approximately 80% called for more information; of those who called, 98.6% of those who met inclusion criteria participated in the first assessment.

The *initial* assessment took place 4–8 weeks after the participant's surgery date. After this, participants were randomly assigned to a control condition or to a 10-week intervention (described below) that began 6–8 weeks after surgery. All participants were reassessed shortly after the conclusion of the intervention (referred to hereafter as the *posttreatment* assessment, which was 3 months after the initial assessment). They were assessed again at a *3-month follow-up* (so labeled because it is a follow-up of the treatment), and again after a *9-month follow-up* (i.e., 14 months after surgery). Women in the control condition were invited to participate in a 1-day seminar approximately 16–18 weeks postsurgery, a time that was after completion of their second assessment.

[3] This data set overlaps greatly with that used by Antoni et al. (2001). That article reported effects of a stress management intervention, including the impact of the intervention on women's subsequent optimism. It did not, however, examine any of the issues under discussion here.

A total of 136 women completed the initial assessment. The longitudinal, multiassessment design of the study led to some degree of missing data, for several reasons, the most obvious being attrition. There were also occasional missed interviews (with participation continuing later on) and occasional omitted measures. For clarity regarding the relationships under study here, the analyses reported in this article were conducted on data from the 97 women who completed all four assessments and for whom no SIP data were missing.

These 97 women had been diagnosed with Stage 0 ($n = 9$), Stage I ($n = 47$), or Stage II ($n = 41$) breast cancer. Nodal involvement ranged from 0 to 24 ($M = 1.41$, $SD = 4.38$). Forty-eight of the women were treated by lumpectomy, and 49 were treated by mastectomy; 40 of the women subsequently were treated with chemotherapy, 45 were treated with radiation (17 had both chemotherapy and radiation), and 27 received tamoxifen. Mean age was 50.37 years ($SD = 9.24$, range = 29–79). Participants included 72 non-Hispanic Whites, 16 Hispanics, 5 Blacks, and 4 who self-identified as other. Average education was 15.71 years ($SD = 5.33$). At entry into the study, 80 participants were currently employed full time ($n = 66$) or part time ($n = 14$), and 17 were not currently working outside the home. Most of the sample were married ($n = 72$), 13 were divorced or separated, 3 were widowed, and 9 were single.

Intervention and Control Groups

As noted earlier, women in this study underwent either an intervention or a control experience. Although that variable is not the focus of this article, it should be described at least briefly (for details, see Antoni et al., 2001). Women in the intervention met weekly for 10 sessions in groups of up to 8 in a room equipped with flat couches used for teaching progressive muscle relaxation. Women in the 1-day seminar that served as the control experience met in the same location. Intervention and seminar were co-led by female postdoctoral fellows and advanced graduate students in clinical psychology.

The experimental condition was a closed, structured group intervention (Antoni, 2003), which met weekly for 2-hr sessions (Antoni et al., 2001; Lutgendorf et al., 1997). The intervention focused on cognitive behavioral stress management techniques but included in-session didactics and experiential exercises and out-of-session assignments (e.g., practicing relaxation exercises and monitoring stress responses). The intervention focused on learning to cope better with daily stressors (particularly cancer- and treatment-related problems and issues) and optimizing use of social resources (for details, see Antoni, 2003; Antoni et al, 2001).

Instead of a no-treatment control, we used a procedure in which control participants received a condensed version of information from the intervention. Women in this condition attended a day-long seminar (5–6 hr) in which they received information about the nature and effects of stress; an outline of the cognitive appraisal process and how it relates to stress and emotions; practice on various relaxation training exercises; and exercises for changing self-defeating appraisals, reducing tension, and acquiring adaptive coping strategies.

This session was designed to provide at least some information on all topics covered in the intervention condition. However, it lacked the therapeutic group environment and accompanying emotional support, the opportunity to hear about other group members' weekly frustrations and triumphs in dealing with their situation, opportunities to role play the techniques and receive group feedback, and the opportunity to observe other group members model new appraisals, relaxation techniques, and coping strategies.

Measures

The personality disposition of optimism versus pessimism was again assessed by the LOT–R, with the same instructions and response format as in Study 1. The alpha in this sample was .77. LOT–R scores ranged from 7 to 24 ($M = 19.96$, $SD = 3.33$).

The same two SIP subscales as in Study 1 were used to measure the adverse impact of breast cancer and its treatment. These subscales assess impact on social activities and on recreation and pastime activities. The SIP scales were readministered at each assessment. Alpha averaged .83 for the raw items of the Social Interaction subscale and .75 for those of the Recreation and Pastimes subscale. The two subscales were strongly correlated (an average correlation of .71 across the four assessments), and we again created a social disruption index by standardizing the subscales and averaging them. We did this separately at each measurement point.

Distress and fatigue were measured by the same item sets as were used in Study 1. As was true of the SIP scales, these measures were included at all assessments.

Results

Testing for Control Variables

We first assessed the possible need for control variables by relating demographic variables (age, education, ethnicity, employment status, marital status) and medical variables (cancer stage, number of positive lymph nodes, type of procedure, radiation status, chemotherapy status, and tamoxifen status) to optimism. The LOT–R did not relate significantly to any of these variables. Ethnicity in this sample was unrelated to the outcome variables (this sample was also less diverse ethnically than that of Study 1). Accordingly, these analyses led to the inclusion of no control variables beyond experimental condition.

As in Study 1, we also examined the role of medical variables as predictors of social disruption. In this case, concurrent reports of chemotherapy related to greater social disruption at posttreatment and at the 3-month follow-up (rs = .26 and .22, ps $< .05$). Accordingly, we included chemotherapy as a predictor in analyzing social disruption as an outcome.

Social Disruption, Distress, and Fatigue Over Time

For descriptive purposes, we examined the temporal course of the outcome variables across the sample as a whole. Reported levels of mood disturbance did not differ significantly across the measurement points ($p > .12$). This pattern is consistent with evidence from previous research, which has typically found that reports of distress are elevated before surgery but not afterward (e.g., Carver et al., 1993). Correlations of the distress at adjacent measures averaged .57.

Examination of unstandardized SIP scores (collapsed across treatment groups) revealed a pattern of greatest disruption at initial assessment, with a continuing (but decelerating) reduction in disruption over the course of the following year. Repeated measures analysis yielded significant effects for recreational pastimes, $F(3, 93) = 6.75$, $p < .001$, and for social interaction, $F(3, 93) = 3.12$, $p < .03$. In each case, the largest reduction came from initial assessment to posttreatment (significantly so for recreational pastimes but not for social interaction). Correlations in these raw disruption scores at adjacent measures averaged .57 for social interaction and .56 for recreational pastimes. Correlations of the standardized adjustment index at adjacent measures averaged .62.

Analysis of fatigue revealed a curvilinear pattern, in which the means differed overall, $F(3, 93) = 6.75$, $p < .02$, but did not differ significantly in adjacent contrasts. Fatigue tended to be lowest at

the initial assessment and highest at posttreatment (when adjuvant therapy had typically been undertaken) and to drift downward thereafter. Correlations of fatigue at adjacent measures averaged .49.

Relations of Optimism to Social Disruption and Proposed Mediators

Table 1 displays standardized regression coefficients for optimism as a predictor of social disruption at each assessment point, with experimental condition and chemotherapy controlled for.

As can be seen from Table 1, greater optimism predicted lower reports of illness-related social disruption at each measurement during the year under study.[4] By contrast, the beta weights for chemotherapy across the four time points were .17 (*ns*), .29 ($p < .01$), .26 ($p < .02$), and .17 (*ns*), respectively (the effect of experimental condition was nonsignificant throughout).

Another question that can be asked of these data is whether optimism predicted relative change in levels of disruption across time blocks. That is, does optimism predict disruption at a given time after level of disruption at the immediately preceding time point is controlled for? The answer to this question is mixed. Controlling for previous disruption eliminated associations at posttreatment and 3-month follow-up. However, when we controlled for disruption at 3-month follow-up (along with chemotherapy and experimental condition), initial optimism still predicted less social disruption at the 9-month follow-up ($\beta = -.19$, $p < .04$).

Optimism also was related to the proposed mediators: distress emotions and fatigue (Table 1). An association with fatigue failed to emerge only at the posttreatment assessment, perhaps because that was the time when fatigue was most generated by chemotherapy and radiation. With that exception, all associations were significant.

We assessed the possibility of mediation by regression analysis, entering condition, chemotherapy, and LOT–R scores as predictors of social disruption (as in Table 1), then entering a hypothesized mediator that had been assessed concurrently with social disruption. We first did this separately for each potential mediator (fatigue and distress), then for the two together. Results of these analyses with respect to the role of optimism are summarized in Table 2, which may be compared with the first row of Table 1.

With regard to the initial assessment, entering either fatigue or distress reduced the beta weight for optimism; the greatest reduction took place when both were entered at once. This is consistent with a degree of mediation by each variable. The patterns that emerged at subsequent assessments were somewhat more ambiguous. Entering fatigue at each later time point reduced the effect of optimism (though entering it at posttreatment did so only slightly, because optimism was not significantly related to fatigue at that time). Entering distress at each of these time points also reduced the effect of optimism. However, entering fatigue and distress together had no more impact on the effect of optimism than did entering distress alone. It appears that the separate mediational effects of fatigue at these later time points are attributable to its overlap with distress. The most parsimonious inference from the pattern as a whole is that the effects of optimism on the final three measures of social disruption were partially mediated by distress.

We also conducted analyses to test the reciprocal mediational possibility: that social disruption might mediate predictive relations from pessimism to distress and fatigue. These analyses did not yield support for this path from pessimism. Prediction from LOT–R scores to distress and fatigue remained robust even when concurrent social disruption was included as a predictor. However, in prediction of distress at the final follow-up, social disruption made an independent contribution ($\beta = .32$, $p < .01$); indeed, this contribution remained significant even when an additional control was instituted for previous level of distress ($\beta = .22$, $p < .02$).

A final set of tests, further exploring potential reciprocal effects between social disruption and distress (ignoring the role of optimism), examined lagged prediction from the one variable to change in the other. For example, we tested prediction from social disruption at posttreatment to distress at 3-month follow-up, controlling for posttreatment distress. These analyses yielded no support for this more remote influence of social disruption on distress, but they did reveal one case in which distress had a lagged association with social disruption. Specifically, distress at 3-month follow-up predicted social disruption at 9-month follow-up when we controlled for disruption at 3-month follow-up.

Table 1
Standardized Regression Coefficients for Optimism Predicting Social Disruption, Distress, and Fatigue at Four Assessments, Study 2

Variable	Initial	Posttreatment	3-month follow-up	9-month follow-up
Social disruption	−.36**	−.25*	−.25*	−.32**
Distress	−.44**	−.24*	−.46**	−.36**
Fatigue	−.30**	−.05	−.24*	−.21*

Note. Analyses of social disruption incorporate an additional control for chemotherapy. Experimental condition was controlled for in all cases.
* $p < .05$. ** $p < .01$.

Discussion

This study followed breast cancer patients from approximately 4–8 weeks after surgery through the following year. Each patient was assessed on several occasions during that period. Pessimism, measured in the first assessment, predicted higher levels of illness-related disruption in social and recreational activities at each assessment point. It even predicted relative disruption at the last assessment after we took into account (i.e., controlled for) disruption 6 months earlier.

Pessimism also predicted higher levels of emotional distress and fatigue during the year after surgery. Tests of mediational hypotheses suggested that the predictive effects of pessimism on social disruption were mediated by the association of pessimism with these variables, particularly distress. This finding was generally consistent with the findings of Study 1, except that the data of Study 1 had also suggested a greater mediational role for fatigue than was evident in Study 2.

Independent of the effects of pessimism, there was sketchy support for the idea that there is a reciprocal effect between

[4] We also tested for interactions between pessimism and experimental condition on these outcomes but found none.

Table 2
Standardized Regression Coefficients for Optimism Predicting Social Disruption in Analyses That Also Entered Concurrent Fatigue, Concurrent Distress, and Both Fatigue and Distress, Study 2

	Initial		Posttreatment		3-month follow-up		9-month follow-up	
Optimism	β	p	β	p	β	p	β	p
With fatigue entered	−.25	.009	−.23	.016	−.16	.09	−.23	.014
With distress entered	−.22	.041	−.21	.044	−.15	.17	−.20	.049
With both fatigue and distress entered	−.19	.064	−.23	.017	−.16	.14	−.20	.04

Note. Experimental condition and chemotherapy were controlled for in all cases.

distress and social disruption (cf. Smith & Wallston, 1992, 1996; Smith et al., 1997). Social disruption predicted concurrent distress at the final follow-up, even when we controlled for levels of prior distress. Distress at the 3-month follow-up predicted disruption at the final follow-up, even when we controlled for prior disruption.

General Discussion

Data from two samples of breast cancer patients yielded patterns of results that were generally consistent across samples regarding the predictive role of dispositional optimism versus pessimism in illness-related disruption of social and recreational activities. In both cases, pessimism predicted higher levels of reported disruption due to the illness and its treatment. Further analyses in both samples suggest that these illness-related disruptions derived at least in part from the higher levels of emotional distress experienced by pessimistic than by more optimistic women.

The possibility of a reciprocal relation between social disruption and distress was also examined on the basis of the idea that withdrawal from the activities of daily life might create further risk of adverse psychological effects such as depression (Bloom & Spiegel, 1984; Smith & Wallston, 1992, 1996; Smith et al., 1997; Williamson, 2000). In our samples, however, there was little evidence that such a reciprocal set of influences stemmed from pessimism. On the other hand, Study 2 did yield some effects that were consistent with a reciprocal relationship, independent of pessimism.

The evidence that social disruption relates to emotional distress conceptually replicates findings reported earlier by Smith and Wallston (1992, 1996; Smith et al., 1997), who studied samples of rheumatoid arthritis patients. Smith and Wallston (1992) found that a measure of psychosocial impairment (which was broader in scope than our measure of social disruption) predicted later depression. Smith et al. (1997), using a measure of coping with arthritis pain that included an index of social isolation, found evidence of reciprocal relations between social isolation and emotional distress.

Our evidence on the latter point is somewhat less consistent than that in the Smith et al. (1997) research, perhaps because the time intervals in our Study 2 were shorter than those in their studies (18 months). Other differences between studies include the fact that our patients entered the study earlier in the illness experience and the fact that rheumatoid arthritis is a disease with a worsening course, unlike the trajectory of recovery that was being experienced by our patients. Whatever the reasons for the differences in findings, the converging evidence of a possible maladaptive spiral involving personality, emotion, and social behavior seems important.

We also note several limitations on our findings. First, our data are behavioroid rather than behavioral. That is, we had to rely on the participants' reports of their social and recreational behaviors rather than being able to monitor those activities directly. Obviously, it would have been preferable to collect direct measures, but obtaining such measures is not always possible. Second, a stronger test of the theoretical reasoning would have been created if we had explicitly assessed participants' social goals and their perceptions of impediments to continued attainment of those goals. We assumed that participants retained goals pertaining to social integration, and we assumed further that the cancer and its treatment created a variety of psychological (and perhaps physical) barriers to continuing activities that would be relevant to those goals. However, we did not measure these goals or barriers directly.

Despite these limitations, the data from the two studies fit a picture in which pessimism leads to a degree of withdrawal from the normal social activities of life when confronted by a medical threat. Alternatively, the studies can be viewed as showing that optimism promotes a continued engagement with life's activities, despite the health threat. We are unable to distinguish between these two construals of the findings; indeed there likely is some degree of truth to both of them. These findings reiterate more generally the fact that personality plays an important role in the adaptation process that takes place when people confront threats to their health and well-being.

The data from these two studies also fit a picture in which these social manifestations of the difference between optimists and pessimists are mediated largely by differences in the subjective experiences of distress and fatigue. That is, women who were more pessimistic also reported higher levels of distress and fatigue than did those who were less pessimistic; those variables in turn had statistical effects that are consistent with mediation. These findings thus build on previous demonstrations that pessimism predicts distress in breast cancer patients (e.g., Carver et al., 1993; Epping-Jordan et al., 1999; Stanton & Snider, 1993). These findings add to the previous ones the indication that the emotional distress experienced by the more pessimistic women have further reverberations into their social lives. The longer term implications of these tendencies would seem to be well worth further attention.

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