Published in final edited form as:

J Soc Clin Psychol. 2010 May ; 29(5): 546–574. doi:10.1521/jscp.2010.29.5.546.

Corroboration of Growth Following Breast Cancer: Ten Years Later

Vicki S. Helgeson

Psychology Department, Carnegie Mellon University

Abstract

Disease-free breast cancer survivors ($n = 180$) were interviewed 10 years after diagnosis. They were asked questions about the lasting effects of cancer. The vast majority identified positive effects. The validity of growth reports was investigated by: (1) comparing survivors' to significant others' responses and (2) comparing survivors' reports to their standing on relevant dimensions. Results revealed little corroboration by significant others but some corroboration by relevant dimensions. There was greater corroboration for the costs than the benefits of breast cancer. Survivors reported more benefits than significant others. There was little evidence that corroboration was greater when the significant other was a spouse compared to someone else. Research should continue to explore the validity and meaning of growth reports.

Keywords

Growth; Benefit-Finding; Cancer; Survivor

For decades health psychologists focused on the negative consequences of stressful life events. Although mention was made of the potential for people to derive benefits from adversity in earlier writings, such as Shelley Taylor's cognitive adaptation theory (Taylor, 1983), it was not until the last 10-15 years that the field of benefit-finding or post-traumatic growth burgeoned, partly in response to the publication of *Trauma and transformation: Growing in the aftermath of suffering* by Tedeschi and Calhoun (1995). From there, empirical studies on benefit-finding proliferated, many of which were in the area of cancer.

A recent review of the literature showed that it is relatively common for people with cancer to find ways in which the cancer experience has enhanced their lives (Stanton, Bower, & Low, 2006). For example, one study of women with breast cancer showed that 83% were able to identify something positive from the experience within the first year of diagnosis (Sears, Stanton, Danoff-Burg, 2003). Another study showed that the majority of women with breast cancer reported that their lives had changed in positive ways because of the diagnosis (Antoni et al., 2001). Common areas of positive change (i.e., domains of growth) among cancer survivors include an enhanced appreciation of life, closer relationships, increased spirituality, a shift in priorities, and increased personal strength (Stanton et al., 2006).

An issue at the forefront of this literature has to do with the veridicality of people's reports of benefits (Linley & Joseph, 2004; Park, 2004; Tomich & Helgeson, 2004; Wortman, 2004). Are people reporting actual changes and transformations in their lives, as suggested by Tedeschi and Calhoun's theory of post-traumatic growth? Or, are people construing benefits from adversity as a way to relieve their distress and cope with the trauma that they have experienced? In other words, reports of growth could reflect cognitive biases motivated by the need to feel good about the self and good about the future. If this is the case, benefits are manufactured and would not necessarily be tied to reality. To understand more about how people construe benefits from adversity and to determine whether this is an advantageous way to cope with stressful life events, it is important to determine if the benefits that people are reporting are based in reality.

There is some evidence to suggest that reports of benefits reflect motivated illusions. McFarland and Alvaro (2000) obtained people's ratings of themselves before and after a stressful event, and determined that people's reports of growth emerged from derogating the past (i.e., perceiving the past as worse than it really was) rather than from actual changes that occurred from past to present. In a study of college students who had experienced a trauma in the past, Davis and McKearney (2003) found that a simple prime to think about the trauma led individuals to report greater meaning in life. Reporting benefits also could reflect denial, especially when benefits are reported shortly after the crisis (Cohen, Hettler, & Pane, 1998). A study of people who had experienced the SARS outbreak showed that those who reported benefits in the absence of costs scored higher on a measure of defensiveness than people who reported both benefits and costs (Cheng, Wong, & Tsang, 2006). Reports of growth also could reflect self-presentation, as network members prefer to be around those who appear well-adjusted, coping well, and free from distress (Coyne, Wortman, & Lehman, 1988). Identifying benefits from adversity in the presence of others is a way of communicating a lack of distress.

There is a dearth of research on the validity of benefit-finding reports. To date, the validity of benefit-finding reports has been examined in four ways. First, researchers have compared the overall mental health of those who identify benefits to those who do not, arguing that those who identify benefits should have superior mental health. Studies that have taken this approach have found little evidence for the validity of growth reports (Frazier & Kaler, 2006; Lehman et al., 1993). However, it is questionable as to whether this is a fair test of the validity of benefit-finding. The theory of post-traumatic growth does not state that growth will be linked to lower levels of distress. In fact, some would argue that the process of growth is associated with *more* distress as life transformations are stressful in and of themselves. Growth could be an outcome in and of itself, independent from psychological distress.

A second way that researchers have examined the validity of growth reports is to link reports of growth to more objective indices of the domain before and after the event. This is a difficult endeavor as one is rarely able to anticipate stressful life events, especially traumatic ones such as the diagnosis of cancer. Thus, baseline data are unlikely to exist. The vast majority of research on stress-related growth is cross-sectional. One exception is a longitudinal study conducted by Park, Cohen, and Murch (1996) in which undergraduates

completed a set of questionnaires twice spaced 6 months apart. At the 6-month assessment, students were asked to recall the most stressful event that had occurred in the intervening 6 months and completed the Stress-Related Growth Scale (SRGS) with respect to that event. Stress-related growth was associated with increases in optimism, positive affectivity, satisfaction with support, and number of support resources over the 6 months. Because these domains of change are reflected on the SRGS, this study provided some evidence for the validity of growth reports. When a similar method was employed with another group of undergraduates, findings were more equivocal. Park and Fenster (2004) measured personal resources and world views before and after a stressful event that students recalled. After the event, they administered the SRGS. Stress-related growth was associated with increases in intrinsic religiosity and mastery from before to after the stressful event. However, stress-related growth was not associated with changes in optimism or changes in world views. Thus, growth reports were related to changes in some domains but not others. To be fair, however, the growth measure was global and not specific to a single domain.

In the absence of pre-event data, researchers have tackled the validity issue by using multiple measures of growth and examining whether there is convergence across measures. For example, Weinrib, Rothrock, Johnsen, and Lutgendorf (2006) had 163 women from the community recall a stressor from the past 3 years and write about how the event affected the person. There were no explicit instructions about possible benefits or gains from the event. Coders' identification of growth from these essays corresponded with scores on an established growth inventory. In addition, specific mention of spirituality in the essay was more strongly associated with the spirituality domain of the growth inventory than the other domains, and specific mention of enhanced relationships in the essay was more strongly related to the relationship domain of the growth inventory than the other domains.

Finally, researchers have examined the validity of growth reports by obtaining information from significant others. One can be more confident that an actual change has occurred in a person if it is corroborated by a significant other. These reports are limited, however, by the visibility of the change. Some areas of change are more likely to be observed by others (e.g., spend more time on relationships) than other areas of change (e.g., more patience). This approach has been used in only three studies. First, undergraduates were asked to recall the most stressful event that had occurred in the past year and then both undergraduates and significant others (i.e., friends, relatives) complete the SRGS with respect to the undergraduate's growth (Park et al., 1996). There was no significant difference between students' and significant others' growth scores, and there was a modest correlation between the two reports ($r = .21, p < .05$). When the relationship between the student and significant other was rated as extremely close, the correlation increased ($r = .31, p < .05$).

A second study showed modest corroboration by significant others (McMillen & Cook, 2003). People with spinal cord injuries and significant others (friends, spouses, relatives) completed a growth measure 18-36 months following the injury. There was a significant difference between survivors and significant others on only 1 of the 7 domains, in the direction of significant others reporting more growth than survivors. Growth reports were correlated between the two sources for only 3 of the 7 domains. The authors concluded that

significant others shared survivors' views that they had experienced growth but that there was minimal agreement on the nature of the growth.

The most correspondence in growth reports emerged from a study of 41 women who had survived breast cancer between 1 and 5 years and their husbands (Weiss, 2002). Survivors and husbands completed the Post-Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996) with respect to themselves and their spouses. Husbands' corroborated wives' reports, and wives' corroborated husbands' reports. That is, there was no significant difference between wife PTGI and her husband's report of her PTGI, and there was no significant difference between husband PTGI and the wife's report of his PTGI. In addition, there were substantial correlations between wives' and husbands' reports of her PTGI (r 's ranged from .28 to .65 across the five domains). These correlations were larger than those observed in the Park et al. (1996) study, possibly because the relationship of the significant other to the survivor was closer in this study. The largest correlation appeared for spiritual change, and the smallest correlation appeared for personal strength. The authors argued that the degree of correspondence may reflect how visible the domain of change is to a significant other.

The correlations reported in these studies, however, do not really address whether significant others are observing the *same* changes in participants as participants observe in themselves. The positive correlation could reflect an overall assessment of mental health, with significant others being more or less likely to endorse positive changes. In addition, positive correlations could represent motivated illusions on the part of both survivor and significant other (McMillen & Cook, 2003).

There were two goals of the present study. First, I identified the long-term effects of being diagnosed and treated for breast cancer by asking 10-year survivors and their significant others to describe the effects of cancer in an open-ended format followed by the completion of a benefit-finding scale. Although I was mostly interested in the benefits gained from breast cancer, I did not want to bias the wording of the questions in a way that suggested survivors *should have benefited*. Therefore I asked about long-term effects in a way that elicited benefits and costs. Despite the large and growing population of cancer survivors, the vast majority of prior research focuses on people's initial reactions to cancer diagnosis and treatment (Gliner & Compas, 1999; King, Kenny, Shiell, Hall, & Boyages, 2000; Ranchor et al., 2002) rather than the long-term effects. The women in this study were 10-year survivors, a group who had some distance from the event and a group for whom very little is known. Thus, there was a unique opportunity to learn how women viewed the experience 10 years later in terms of both benefits and costs.

Our second and primary goal was to examine the veridicality of women's reports of benefits. I did this in two ways. First, significant others were interviewed—people who women said were around at the time of diagnosis and treatment and with whom women were still in contact. Whereas significant others' views in the three previous studies reflected varying lengths of time (6 months to 5 years), this study had the advantage of having significant others who had spent time with the individual over a 10-year period, affording many opportunities to observe the lasting impact of breast cancer. I compared survivors' and significant others' open-ended and close-ended reports of the benefits and costs of breast

cancer. I also examined whether the closeness of the relationship moderated correspondence of benefits and costs, based on the findings of Park et al. (1996). Closeness was operationalized by comparing significant others who were spouses to significant others who were not spouses. I predicted that there would be greater correspondence in reports when the significant other was a spouse compared to another relative or friend based on the *acquaintanceship effect*, which shows that the length/degree of acquaintance is associated with greater agreement between self and other rating of the self's personality (Letzring, Wells, & Funder, 2006). Other research has shown that relationship intimacy predicts concordance of support behaviors between support recipient and support provider (Coriell & Cohen, 1995); thus, spouse relationships seemed more intimate on average than relative/friend relationships. Thus, the independent variable in these analyses is source (survivor vs. significant other) and the dependent variables are the benefit-finding scale and the open-ended responses to the specific lasting benefits and costs of breast cancer. SO relationship (spouses vs. nonspouse) is hypothesized to be a moderator variable.

Second, I examined veridicality by linking reports of benefits and costs to survivors' standing on dimensions that reflected the specific benefit and cost. For example, at 10-year follow-up some survivors noted that breast cancer had led to a more negative self-image. I compared survivors' open-ended reports of a negative self-image as a lasting effect of breast cancer to survivors' standing on a measure of self-image. Although both variables are based on self-report, one can be more confident that breast cancer had a lasting negative effect on self-image if the self-image of respondents who gave this response is more negative than respondents who did not give this response. As the nature of the changes that survivors would report was not known ahead of time, variables were not always available to reflect each of the dimensions of change. I took advantage of the fact that there were variables that reflected some of the positive and negative changes that survivors noted. This approach was more compelling when data had been collected data on the variable at diagnosis so that actual change on the dimension in question could be assessed. For example, in the case of self-image, there were data on respondents' self-image not only at 10-year follow-up but also at diagnosis so that changes in self-image could be examined. That is, I could determine whether those who reported a lasting negative effect on self-image showed a decline in their score on the self-image variable between diagnosis and follow-up. For these analyses, the independent variables are the specific domains of change identified from open-ended questions and the dependent variables are the corresponding self-report indices that were available.

Method

Participants

The data examined in this paper are drawn from 10-year follow-up interviews of women who were diagnosed with Stages 1, 2, or 3 breast cancer and treated with surgery followed by adjuvant chemotherapy. The majority (86%, or 312 or 364) of the women who were recruited into the study at diagnosis agreed to be randomly assigned to one of four arms of a clinical trial of support interventions (Helgeson, Cohen, Schulz, & Yasko, 1999). The remaining 14% continued to complete questionnaires over the course of the study. This

study is based on our attempts to contact all of the women approximately 10 years after the initial interview.

At 10-year follow-up, attempts were made to contact each of the original 364 women and 240 of them (66%) were interviewed. The other women had either died (22%), withdrawn from the study in the past or refused the 10-year interview (10%), or were unable to be located (2%). Neither participation in the randomized support intervention trial nor the specific support condition was associated with survival or participation in the 10-year follow-up interview.

Of the 240 women interviewed, 37 had sustained a recurrence and 10 had had another cancer. Because the focus of this paper is on the benefits and costs of the diagnosis and treatment for cancer among disease-free survivors, these participants were excluded, leaving us with 193 disease-free and cancer-free participants. Of the 193, 180 identified a significant other who agreed to be interviewed. Thus, the present report is based on the 180 disease-free women who were interviewed 10 years after their entry into our study along with a significant other. There were no differences between the 180 women who identified a significant other and the 13 women who did not on the demographic variables shown in Table 1.

Demographic characteristics for these 180 women as well as the initial 364 women who were enrolled in the initial study are shown in Table 1. In many ways the sample interviewed for this paper was similar in demographics to the sample originally recruited. There are two exceptions. The disease-free sample interviewed at year 10 was more homogenous in terms of race compared to the initial sample, although the initial sample was also quite homogenous. The initial sample was comprised of 93% white women, whereas the sample in this paper was 97% white women. Although race was not related to death at 10 years, it was related to recurrence at 10 years ($X^2 = 4.61, p < .05$). Whereas 29% of Caucasians had recurred, 50% of minority persons had recurred. Second, as to be expected, a larger percentage of women with stage 1 disease at diagnosis were alive at 10-year follow-up and a smaller percentage of women with stage 3 disease at diagnosis were alive at 10-year follow-up.

Procedure

Women were contacted by phone about 10 years following their initial interview. The initial interview took place 4 months after diagnosis ($M = 119$ days), and the 10-year follow-up interview took place on average 10.58 years after diagnosis ($SD = .45$). Women were interviewed in their homes. At the end of the interview, women were asked to identify a significant other (SO)—someone who was around during the time that they were diagnosed and with whom they were still in contact. If married, this person was requested to be a spouse. If they were not married or did not want to ask their partner, a close relative or friend was identified. Of the 120 women who were married or living with a partner, 101 identified their partner as their SO. The other 19 identified someone else. In addition, one divorced person identified their former partner as the SO. There were no differences in psychological health between survivors whose spouse did and did not serve as the SO. The relation of the SO to the survivor is shown in Table 2. The spouse served as the SO in 57%

of the cases, and nonspouses (child, parent, friend, relative) served as the SO in 43% of the cases. Both survivors and SOs were provided with a small monetary compensation for their participation in the 10-year interview.

Measurement of Benefits and Costs of Breast Cancer

Open-ended questions—A series of open-ended questions was asked to find out if breast cancer had had a lasting impact on women's lives. Specifically, women were asked the following five questions: (1) Now that it is more than 10 years later, do you see that breast cancer has had any lasting effects on your life? (2) Are there ways in which breast cancer affected you early on (first few years) that no longer affect you now? (3) Is there anything you have done differently over the past 10 years because of your history of breast cancer? (4) Is there anything you did *not* do over the past 10 years because of your experience with breast cancer? (5) How, if at all, would your life today be different if you hadn't had breast cancer? SOs were asked the same five questions with respect to the survivor.

Because there was overlap in the responses to each of these questions, two independent coders read the answers to all five questions for an individual respondent and coded each response into one of 28 categories. These categories were developed by having two people read through a sample of responses. The inter-rater reliability between the two coders was high for survivors and SOs ($\kappa = .92$ and $.88$ for survivor and SO, respectively). Disagreements were resolved by a third party.

Benefit-Finding Scale—The 16-item Benefit-Finding Scale (BFS; Tomich & Helgeson, 2002) was administered. Five positive growth domains are represented: personal priorities (e.g., more grateful for each day), daily activities (e.g., interest in new activities), family (e.g., more sensitive to family issues), world views (e.g., more concerned for the future of humankind), and relationships (e.g., closer to people). Participants rated the extent to which each of these changes had occurred as a result of having had breast cancer on a 4-point scale, ranging from 1 (not at all) to 4 (very much). The average score was 2.55 ($SD = .78$). To establish convergent validity, the Post-Traumatic Growth Inventory (Tedeschi & Calhoun, 1996) was administered and correlated $.76$ ($p < .001$) with the BFS. The BFS also was administered to SOs, with respect to the survivor. That is, SOs indicated the extent to which each change had occurred in the survivor due to breast cancer. The internal consistency of the scale was high for survivors ($\alpha = .93$) and SOs ($\alpha = .94$). Because the BFS also was administered at baseline, I could examine whether reports of positive changes were associated with changes on the BFS.

Other Instruments Used to Test Validity

After the benefits and costs of breast cancer had been elicited from participants, the interview data were reviewed to determine if other data had been collected that conceptually represented the benefits and costs identified from open-ended responses. This turned out to be the case for 7 open-ended responses: changes in self-image could be linked to the body image scale; positive and negative emotional changes could be linked to positive and negative affect; negative physical changes could be linked to physical functioning; increased spirituality could be linked to the spirituality scale; health behavior changes could be linked

to measures of specific health practices; and increased helping others with cancer could be linked to involvement in breast cancer activities. For the first four open-ended responses, corresponding instruments had been administered (i.e., body image, positive affect, negative affect, physical functioning) at baseline (i.e., shortly after diagnosis) as well as at 10-year follow-up; thus, changes in these domains over the 10 years could be assessed. These instruments are described below.

Body image—A 14-item body image scale was developed based on the Cancer Rehabilitation Evaluation System (Schag & Heinrich, 1988). Sample items are “I am comfortable with my body,” “I do not feel sexually attractive” (reverse scored) and “I often feel self-conscious about my appearance” (reverse scored). Higher numbers indicate a more positive body image. The instrument was administered at baseline ($\alpha = .89$) and 10-year follow-up ($\alpha = .93$).

Positive and negative affect—Positive and negative affect over the past week were measured with the 20-item Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988). Each item is rated on a 5-point scale (1 = not at all; 5 = extremely). The internal consistency of the positive affect scale was high at both baseline ($\alpha = .86$) and follow-up ($\alpha = .89$), as was the negative affect scale (baseline, $\alpha = .87$; follow-up, $\alpha = .86$).

Physical functioning—The SF-36 from the Medical Outcomes Study was administered at 10-year follow-up as well as baseline (Ware, Snow, Kosinski, & Gandek, 1993). This instrument has excellent reliability and validity and has been used to evaluate functional status in depressed, chronically ill, and healthy populations (Wells et al., 1989). The SF-36 consists of 36 items that form eight multi-item scales. In the present paper, only the Physical Functioning subscale was examined. Higher scores indicate better functioning.

Spiritual well-being—The 12-item spiritual well-being subscale of the Functional Assessment of Chronic Illness Therapy scale was administered only at 10-year follow-up (Brady, Peterman, Fitchett, May, & Cella, 1999). Each item is rated on a 5-point scale. The measure has two factors: (1) Faith, which reflects finding comfort and strength from religion (4 items), and (2) Meaning/Peace, which reflects a sense of purpose in life more generally (8 items). Internal consistencies were high (α s = .89 and .91, respectively). The two scales were moderately related, $r = .45$, $p < .001$.

Health behaviors—Five questions were asked about current health behaviors at 10-year follow-up: (1) whether respondent smoked or not, (2) how many days a week typically exercise, (3) whether respondent had a pap smear in the past year, (4) whether respondent had a mammogram in past year, (5) whether respondent regularly practices breast self-exam or not.

Activism—At 10-year follow-up, survivors were asked whether they had been involved in any activities related to breast cancer over the past year (e.g., volunteering, Race for the Cure) on a 4-point scale, ranging from 1 (not at all) to 4 (a lot).

Results

Goal #1: Identifying the Long-Term Effects of Breast Cancer

Although responses were coded into 28 categories, only 13 categories were identified by 10% of either survivors or SOs. To reduce the number of analyses and focus on the most common domains of change, analyses were restricted to these 13 categories. As shown in Table 3, the most frequent area of change was in health behavior, an area of change that is omitted from conventional growth inventories. Nearly half of respondents identified this domain of change. It included visiting the doctor regularly, exercising, and diet. The next most frequent area of change was in having a greater appreciation of life, a domain of benefits central to growth inventories. Other common areas of change had to do with relationships, emotions, physical health, and personality. These domains of change are typically reflected in current growth inventories. It is noteworthy that the most frequently named domains of change were positive. However, several areas of negative change also were identified. Negative effects included fears of recurrence, adverse effects on physical health, negative self-image, and negative emotional changes.

To see if these areas of change could be reduced to a smaller set of conceptual categories, a factor analysis for dichotomous data was conducted on survivors' responses using Testfact 4 (Wood et al., 2003). Testfact 4 uses the minimum squared residuals method to extract factors, which is then followed by promax (oblique) rotation. Results revealed a three-factor solution. The first factor consisted of positive changes (positive emotion, spirituality, help others with cancer, more communal, positive relationship changes); the second factor consisted of negative changes (negative emotion, negative physical health, negative self-image, fear of recurrence) and two other changes for which the valence is less clear (concern for family health, health behavior); the third factor consisted of more relaxation and greater appreciation of life. To determine if a more parsimonious solution could be reached with one factor representing positive changes and one factor representing negative changes, a two-factor solution was requested. The two-factor solution resulted in a first factor containing all positive items. The second factor consisted of all the negative changes, including concern for family health and health behavior changes, and a negative loading for relaxation.

Thus, from a conceptual standpoint, it appeared that the positive changes reflected one common factor and the negative changes reflected a second common factor. It is interesting that health behavior changes (i.e., eating a good diet or visiting the doctor on a regular basis) loaded on the negative change factor suggesting that these changes which have positive implications for health may not be perceived by survivors as positive life changes. A positive life change index and a negative life change index were computed by summing across the respective items. The positive life change index was uncorrelated with the negative life change index, $r = -.07$, n.s.

For the analyses reported below, survivor and SO correspondence on the total positive and negative life change indices were examined as well as the individual domains of change.

Goal #2: Validity of Benefit-Finding Reports: Corroboration between Survivors and SOs

Corroboration between survivor and SO reports can be examined in a number of ways. First, survivors' and SOs' BFS scores were compared. There was no difference in the average score reported by survivors and SOs. However, the two scores were uncorrelated. Thus, although the average amount of change is viewed as the same by survivors and SOs, within each couple there is no indication that the two people's reports correspond with one another. Second, the positive and negative life change indices noted by survivors and SOs were compared with a two-way repeated measures (survivor vs. SO; positive vs. negative) analysis of variance. There was a main effect of source (survivor vs. SO), $F(1, 179) = 14.44$, $p < .001$, that was qualified by an interaction with valence of change (positive vs. negative), $F(1, 179) = 21.39$, $p < .001$. As shown in Figure 1 and verified by contrasts, survivors reported more positive changes ($M = 1.61$) than SOs ($M = .93$), $t(179) = 5.70$, $p < .001$, but survivors and SOs reported similar amounts of negative changes ($M = 1.14$; $M = 1.24$, respectively). An alternative perspective is that survivors reported more positive than negative change, $t(179) = 3.40$, $p < .001$, but SOs reported more negative than positive change, $t(179) = -2.69$, $p < .01$. There was no correlation between survivors' and SOs' positive life change index, $r = .11$, n.s., or between survivors' and SOs' negative life change index, $r = .12$, n.s.

Third, whether survivors and SOs identified the same specific areas of change was examined with the kappa statistic. This approach was used by Coriell and Cohen (1995) to determine whether support recipients and support providers agreed that a specific support behavior occurred. This analysis addressed the question—if one person identified a change, did the other person identify the *same* change? As shown in the first column of Table 3, the kappa statistics are all fairly small. The largest kappas (bolded) occurred for four areas of change: negative physical health, helping others with cancer, negative self-image, and negative emotional changes. Thus, overall there was little correspondence between the specific lasting effects identified by survivors and SOs. There seemed to be greater correspondence for the long-lasting negative effects of cancer than the long-lasting positive effects. The one positive domain for which there was some correspondence is a domain in which the effects may translate into concrete behaviors that are more easily observed by SOs.

Finally, the frequency with which a change was named by survivors as a group compared to SOs as a group was examined with the McNemar test for correlated proportions. This test statistic is used to compare the frequency of binary variables. Here the question is whether survivors or SOs as a group were more or less likely to identify specific areas of change. The percentage of survivors and SOs who identified each area of change is shown in Table 3 along with the significance (p) of the McNemar test. As indicated by the bolded p 's, survivors were more likely than SOs to report a number of positive changes: greater appreciation of life, positive relationship changes, being more communal, being more relaxed, and greater spirituality. By contrast, SOs were more likely than survivors to note two areas of negative change: a fear of recurrence/death and negative emotional changes. When the Bonferroni adjustment to alpha for conducting multiple comparisons was applied ($\alpha = .004$), 5 of the 7 effects remained significant.

Spouse versus nonspouse corroboration—Next whether the nature of the survivor's relationship to the SO influenced the degree of correspondence was examined, hypothesizing greater correspondence when the SO was a spouse as compared to someone else (i.e., “nonspouse”). Before investigating this issue, demographic and disease characteristics of survivors with ($n = 102$) and without ($n = 78$) spouse SOs were examined. There were no group differences on any disease-related variable or demographic variable shown in Table 1, with the exception that survivors whose SOs were spouses were 2 years younger ($M = 58.34$, $SD = 8.12$) than survivors whose SOs were not spouses ($M = 60.92$, $SD = 8.98$), $t(178) = 1.97$, $p < .05$. There were no group differences in mental or physical health.

Differential corroboration between spouses and nonspouses were examined in the same four ways. First, survivors' and SOs' BFS scores were compared with a repeated measures analysis of variance. There was a significant interaction between relationship (spouse, nonspouse) and source (survivor report, SO report), $F(1, 176) = 6.56$, $p < .05$. As shown in Figure 2, survivors reported more benefits ($M = 2.59$; $SD = .76$) than spouse SOs ($M = 2.35$; $SD = .76$), whereas survivors reported fewer benefits ($M = 2.52$; $SD = .79$) than nonspouse SOs ($M = 2.70$; $SD = .75$). Second, survivors' and SOs' positive and negative life change indices were examined as a function of whether the SO was a spouse or a nonspouse. On these measures, there were no effects involving the relation of the SO to the survivor.

Fourth, the kappa statistic was computed between survivors and spouse SOs and then between survivors and nonspouse SOs for the lasting effects of breast cancer. As shown in Table 3, all of the kappas for spouse and nonspouse SOs remained fairly small (larger are bolded). In only one case was the kappa for spouses significantly larger than the kappa for nonspouses—the case of being more communal, $z = 1.99$, $p < .05$.

Finally, whether survivors as a group or SOs as a group were more or less likely to identify a specific domain of change was examined as a function of whether the SO was a spouse or not with the McNemar test of correlated proportions (see last two columns of Table 3). There was a significant difference between survivors and SO reports for health behavior change such that survivors were more likely to note health behavior changes than spouse SOs (51% vs. 32%). However, there was no difference between survivor and SO report of health behavior changes when the SO was a nonspouse (40% vs. 49%). The same pattern held for appreciation of life and positive relationship changes. When the SO was a spouse, survivors were more likely to report appreciation of life than the SO (44% vs. 24%), but there was no difference between survivor and SO report when the SO was a nonspouse (39% vs. 31%). When the SO was a spouse, survivors were more likely to report positive relationship changes than SOs (28% vs. 5%), but there was no difference between survivor and SO report when the SO was a nonspouse (19% vs. 14%).

For three variables—relaxation, spirituality, and negative emotions—there was a significant difference between survivor and SO reports but findings held the same for spouse and nonspouse SOs (see Table 3). Survivors reported being more relaxed and greater spirituality than SOs, and SOs reported more negative emotions than survivors—regardless of whether the SO was a spouse or not.

Goal #2: Validity of Benefit-Finding Reports: Links to Standing on Relevant Dimensions

The second way that the validity of benefit-finding reports was examined was to link open-ended reports of change to survivor standing on relevant dimensions to the extent that they were available. I acknowledge two caveats at the outset. First, the overall study was not designed a priori to address this question. Thus, the analyses are admittedly posthoc. Second, these dimensions are not completely objective; they are still based on self-report, which means that they share common method variance with the open-ended reports of change. First, survivors' positive life change index was compared with their scores on the BFS and changes on the BFS over time. Then, survivors' perception of a change on a specific dimension was compared with their standing on that dimension at a given time. Survivors' present standing on 7 dimensions that corresponded to 7 specific open-ended responses was available. For 4 of these dimensions, baseline data were available so that changes over the 10 years could be examined by controlling for the relevant baseline variable (i.e., partial correlation analyses).

Overall positive changes—Survivors' positive life change index, derived from open-ended reports, was associated with higher BFS scores ($r = .17, p < .05$) and increases in BFS scores over the 10 years (partial $r = .17, p < .05$). SOs' positive life change index was not associated with BFS scores or changes in BFS scores over time.

Self-image—Survivor open-ended reports of negative effects on self-image were related to a lower score on the body image scale, indicating a negative self-image, $r = -.16, p < .05$. SO reports corroborated this finding, meaning that SO reports of negative effects on survivor self-image were associated with survivors' scores on the body image scale, $r = -.15, p < .05$. Because body image was measured at baseline, changes in body image were examined over time. Survivor reports of negative effects on self-image did not predict changes in body image. However, there was a trend for SO reports of negative effects on self-image to predict declines in (positive) body image over time, $r = -.13, p < .10$.

Positive emotion—Survivor open-ended reports of positive emotional changes was associated with current survivor positive affect ($r = .22, p < .01$) as well as increases in positive affect over the 10 years (partial $r = .26, p < .001$). This was not corroborated by SOs.

Negative emotion—Survivor open-ended reports of negative emotional changes were not associated with current negative affect or changes in negative affect over the 10 years. There also was no corroboration by SOs.

Physical health—Survivor open-ended reports of adverse physical changes was associated with lower current physical functioning ($r = -.24, p < .001$) and a deterioration in physical functioning over the 10 years (partial $r = -.22, p < .01$). SOs corroborated both of these reports ($r = -.21, p < .01$; partial $r = -.20, p < .01$).

Spirituality—Survivor open-ended reports of spirituality were associated with survivor reports of greater faith ($r = .28, p < .001$) but not greater meaning ($r = .06, n.s.$). SO open-

ended reports of spirituality were associated with survivor reports of greater faith ($r = .17, p < .05$) and greater meaning ($r = .15, p < .05$).

Health behavior—The health behavior change response, as reported by survivors or SOs, was not associated with any individual indices of good health behavior (smoking status, exercise, pap smear within past year, mammogram within past year, breast self-exam) or a combined index of all these behaviors.

Activism—One of the open-ended responses was helping others with cancer. There are a lot of ways to help other people with cancer, but one possibility is to become involved in breast cancer activities. Survivors were asked how often in the past year they had been involved in activities related to breast cancer on a 4-point scale ranging from “not at all” to “a lot.” Because scale responses were highly skewed, responses were recoded into a dichotomous variable, never (51%) compared to once in a while, sometimes, and a lot (49%). This variable was related to the open-ended response, $\chi^2(1) = 4.08, p < .05$. Of the women who said they had changed by helping others with cancer, two thirds (66%) had been involved in breast cancer activities over the past year. SOs corroborated this change, $\chi^2(1) = 7.83, p = .005$. Of the SOs who said the women had changed by helping others with cancer, nearly three-quarters (72%) of the women said they had been involved in breast cancer activities.

Discussion

Long-Term Effects of Breast Cancer

The first goal of this study was to identify the effects of having been diagnosed and treated for breast cancer over a 10-year period. Both survivors and SOs identified a variety of long-lasting effects, most of which were positive. Some of the effects noted by survivors are reflected in current growth inventories, and some are not. The health behavior domain was the most frequently cited area of long-lasting effects, and it is an area of change that is not reflected in current growth inventories. This omission also was observed by Sears et al. (2003) who found that 13% of women identified health-related benefits within a year of being diagnosed with breast cancer. However, the factor analysis revealed that health behavior changes loaded with negative effects of breast cancer rather than positive effects, suggesting that this positive change for health may not really be perceived as a benefit by survivors. Although health behaviors would seem to be a very concrete and visible change, there was no corroboration for this area of change by SOs. In fact, as a group, spouse SOs were *less* likely than survivors to note health behavior changes among survivors.

There were a number of areas of positive change identified by survivors and SOs that reflect domains tapped by conventional inventories. For example, both the BFS and the PTGI include relating to others (e.g., a sense of closeness with others) and appreciation of life (e.g., appreciation of each day), and the PTGI includes spiritual change (e.g., stronger religious faith). Our open-ended responses captured each of these domains. The BFS and PTGI include a domain related to new possibilities (e.g., developing new interests) which was not reflected in our open-ended responses. Some of our other common responses, such as being more communal, helping others with cancer, and being more relaxed, are reflected

in the PTGI's personal strength domain and in the BFS items having to do with world views. One area of change that was detected, and is not necessarily captured by conventional inventories, is the positive emotional changes response. Survivors often referred to having a positive outlook, feeling happier, and being more content. Future work in this area may want to include this domain of growth.

Although the responses to open-ended and close-ended items reflected a strong emphasis on growth and positive changes from breast cancer, several long lasting negative effects were noted. Nearly 20% of survivors said that they had fears of recurrence or death and that there were lasting negative effects on their physical health. In addition, a small percentage of women (14%) noted lasting negative effects of breast cancer on their self-image, and a smaller percentage (6%) reported lasting negative effects on their emotions (e.g., more pessimistic, sad). These responses suggest that the future outlook for survivors is not completely positive and that there may be a subgroup of survivors who remain distressed and in need of clinical care.

Validity of Benefit-Finding (and Cost) Reports via Significant Others

The validity of survivor's benefit-finding reports was examined by interviewing SOs about the lasting effects of breast cancer on the survivor. Overall, those reports revealed little corroboration for benefits. Although survivors' and SOs' scores on the BFS were the same, the scores within a couple were uncorrelated. It also was not the case that survivors and SOs identified the *same* positive changes in response to open-ended questions. The only positive change identified by survivors that revealed some corroboration by SOs was helping others with cancer. Helping others with cancer includes helping other women cope with breast cancer and talking to other women about their experience with breast cancer. This is an area of change that is fairly concrete and easy to observe by others.

By contrast, there was some SO corroboration for the negative lasting effects of cancer on survivors. Survivors' reports of negative effects on physical health, a negative self-image, and negative emotional change revealed modest corroboration by SOs. Because negative changes are obviously a concern for both survivors and SOs, they may attract more attention and be more visible. This finding fits with other research that shows there is more consistency in people's reports of the occurrence of negative behaviors than positive behaviors (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). People seem to react more strongly to negative than positive behaviors, and there is more elaborate processing of negative than positive information.

It was hypothesized that there would be greater corroboration for open-ended responses by spouses than nonspouse SOs. There was little support for this idea. In only one instance did spouse SOs show significantly greater corroboration than non-spouse SOs—in the case of being more communal.

When survivors and SOs were examined as two groups, there were differences in the level of many of the changes reported. Survivors as a group were more likely than SOs as a group to note lasting effects that were positive. Specifically, survivors reported greater appreciation of life, greater positive effects on relationships, greater increase in communality, greater

increase in relaxation, and greater spiritual change compared to SOs. By contrast, SOs as a group were more likely to note greater fears of recurrence and greater negative emotional changes than survivors. There are a variety of explanations for these findings. First, it may be that survivors are presenting themselves more positively to the interviewer than they really are, and SOs are less vulnerable to this demand characteristic. SOs may be more willing to identify adverse effects of the experience that survivors do not want to acknowledge. Alternatively, it may be that the negative effects of cancer are more salient to SOs who have not personally faced cancer. That is, SOs may project their own feelings onto that of the survivor. SOs were much more likely than survivors to bring up lasting fears of recurrence and/or death. This could reflect how the SO imagines the survivor to feel rather than the survivor's actual feelings. The benefits of cancer may be less vivid for SOs.

The findings regarding the relationship of the SO to the survivor suggest that demand characteristics may be a viable explanation for the discrepancy between the views of survivors and SOs. Contrary to our hypothesis, spouse SOs were *less* likely than nonspouse SOs to observe changes in health behavior, appreciation of life, and positive relationship changes. Spouse SOs also had lower scores on the BFS than survivors, whereas nonspouse SOs had higher scores on the BFS than survivors. To the extent that spouses are closer to survivors than nonspouses, one would expect spouse reports to be more accurate than nonspouse reports. That being the case, why do nonspouse SOs perceive the effects of breast cancer to be more positive? It may be that survivors are presenting themselves to family and friends more positively than they are to spouses in an effort to retain relationships and keep people from withdrawing. Survivors are well aware of the fact that other people are uncomfortable discussing cancer and wish them to be positive (Coyne et al., 1988). That is, survivors' self-presentation concerns may lead them to present the effects of breast cancer as more positive than they really are. While these efforts are convincing to friends and other family members, they are not convincing to spouses. Alternatively, survivors may not need to go to these same efforts to retain a spouse relationship. This would explain why spouses underestimated the benefits of breast cancer compared to survivors on both the BFS and some of the open-ended responses.

An alternative interpretation of the data is that spouses are less accurate and underestimate benefits compared to nonspouse SOs. Why would this be? One possibility is that spouses are all men, whereas nonspouse SOs are primarily women (89%). In this study, the SO relationship (spouse, nonspouse) is confounded with sex. Thus, it may not be that spouses are less accurate in estimating the effects of breast cancer compared to nonspouses, but that men are less accurate in estimating the effects of breast cancer than women. Some research suggests that women are more accurate in detecting others emotions and decoding nonverbal behavior than men (Hall, Carter, & Horgan, 2000; Rosip & Hall, 2004). This supports the possibility that women may be more accurate than men in perceiving the lasting effects of breast cancer. Only future work that includes both males and females who have faced a life threat, as well as their significant others, will shed light on this issue.

Validity of Benefit-Finding Reports via Survivor Standing on Dimensions

A second way that the validity of survivors' benefit-finding reports was examined was by linking reports of lasting changes to survivors' standing on the corresponding dimensions. Here more evidence of corroboration was found. For five of the seven domains that were examined, survivor reports of change were linked to survivor standing on the relevant dimension: negative self-image, positive emotional changes, negative effects on physical health, spirituality, and helping others with cancer. In some of these cases, SOs' responses were also linked to survivors' standing on the corresponding dimension. In four instances, baseline data were available on the corresponding dimension so that survivors' reports of change could be linked to an actual change in the dimension over time. In two cases, survivors reports of a change was linked to actual changes on the dimension—one was a positive change (positive emotional changes) and one was a negative change (deterioration in physical health). Thus, there is greater confidence in a survivor's report that breast cancer has led her to experience more positive emotions because she also reports an increase in positive affect over the 10 years. The same can be said for confidence in reports of a deterioration in physical functioning. It must be acknowledged, however, that even these data are limited by the fact that both measures are based on self-report.

Conclusion and Final Remarks

Before concluding, several study limitations must be acknowledged. First, the sample was entirely female and extremely homogenous in terms of race and ethnicity, make the generalizability of these findings to men and to people of more varied racial and ethnic backgrounds uncertain. A recent meta-analysis on growth showed that minority persons are more likely to engage in benefit-finding than non-minority persons and that the relation of benefit-finding to positive mental health outcomes was stronger among minority persons (Helgeson, Reynolds, & Tomich, 2006). Second, there are limitations to the use of significant others as objective recorders of the lasting effects of breast cancer. Not all effects of breast cancer are observable to significant others, and significant others might be influenced by some of the same biases and demand characteristics that survivors face. Third, the closeness of the SO relationship was operationalized by using spouse versus nonspouse as an indicator of closeness. However, it is not the case that all survivors were closer to their spouses than to other relatives or friends. In addition, the nonspouse category was a heterogeneous one—consisting of both friends and relatives. Fourth, only 66% of the original sample completed the 10-year follow-up interview. However, 22% of the original sample had died in the interim. Thus, retention of 10-year survivors was much more positive than this figure first appears. Over a 10-year period, only 12% were lost to follow-up or refused the interview.

Despite these limitations, the findings from this study make a substantive contribution to the literature on breast cancer survivorship as well as growth following trauma. Numerous long-lasting effects of the breast cancer experience were identified, both positive and negative. When the positive effects were compared to ones that researchers have identified in growth inventories, many domains that are represented in such measures were confirmed but new domains also were identified for future researchers to take into consideration. One of the

most difficult conceptual issues that is facing the area of growth or benefit-finding following trauma is the validity of these reports. This is by far the largest study to address this issue with the use of significant others--significant others who were in women's lives when they were first diagnosed with breast cancer as well as 10 years later. Validity also was examined by the linkage of growth reports to survivors' standing on relevant dimensions, some of which were able to be explored longitudinally because of the availability of baseline data at diagnosis.

In summary, the vast majority of 10-year survivors of breast cancer were able to identify lasting effects of the experience, the majority of which were positive. The emphasis on benefits from the experience is consistent with past research. However, there was little evidence of corroboration of those benefits by significant others, regardless of whether the significant other was a spouse or another relative/friend. The corroboration that did exist seemed to be greater for the costs than the benefits of breast cancer. Significant others, as a group, also reported less positive change and more negative change compared to survivors, suggesting that survivors' reports of benefits may partly reflect self-presentation. It is notable that there are three domains of change corroborated by both SO reports and by survivors' standing on relevant dimensions, one of which is positive (help others with cancer), and two of which are negative (negative self-image, negative physical health changes). Corroboration for the latter two negative domains is impressive as baseline data were taken into consideration for those variables. Thus, confidence is increased that survivors who report that breast cancer has had a lasting negative effect on their self-image and physical health have really experienced declines in both of these domains.

Acknowledgments

This research was supported by NIH R21 CA104078. The author would like to thank Abigail Kunz-Vaughn, Elizabeth Muia, and Dara Stern for conducting the 10-year follow-up interviews with the patients for this study. The author also is grateful for the dedication that the patients in this study showed over the 10 years.

References

- Antoni MH, Lehman JM, Kilbourn KM, Boyers AE, Culver JL, Alferi SM, Yount SE, McGregor BA, Arena PL, Harris SD, Price AA, Carver CS. Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer. *Health Psychology*. 2001; 20:20–32. [PubMed: 11199062]
- Baumeister RF, Bratslavsky E, Finkenauer C, Vohs KD. Bad is stronger than good. *Review of General Psychology*. 2001; 5:323–370.
- Brady MJ, Peterman AH, Fitchett G, May M, Cella D. A case for including spirituality in quality of life measurement in oncology. *Psycho-Oncology*. 1999; 8:417–428. [PubMed: 10559801]
- Cheng C, Wong W, Tsang KW. Perceptions of benefits and costs during SARS outbreak: An 18-month prospective study. *Journal of Consulting and Clinical Psychology*. 2006; 74:870–879. [PubMed: 17032091]
- Cohen, LH., Hettler, TR., Pane, N. Assessment of posttraumatic growth. In: Tedeschi, RG, Park, CL., Calhoun, LG., editors. *Posttraumatic growth: Positive changes in the aftermath of crisis*. Lawrence Erlbaum Associates; Mahwah, NJ: 1998. p. 23–42.
- Coriell M, Cohen S. Concordance in the face of a stressful event: When do members of a dyad agree that one person supported the other? *Journal of Personality and Social Psychology*. 1995; 69:289–299. [PubMed: 7643306]

- Coyne, JC., Wortman, CB., Lehman, DR. The other side of support: Emotional overinvolvement and miscarried helping. In: Gottlieb, BH., editor. *Marshaling social support: Formats, processes, and effects*. Sage Publications; Thousand Oaks, CA: 1988. p. 305-330.
- Davis CG, McKearney JM. How do people grow from their experience with trauma or loss? *Journal of Social and Clinical Psychology*. 2003; 22:477-492.
- Frazier PA, Kaler ME. Assessing the validity of self-reported stress-related growth. *Journal of Consulting and Clinical Psychology*. 2006; 74:859-869. [PubMed: 17032090]
- Glinder JG, Compas BE. Self-blame attributions in women with newly diagnosed breast cancer: A prospective study of psychological adjustment. *Health Psychology*. 1999; 18:475-481. [PubMed: 10519463]
- Hall, JA., Carter, JD., Horgan, TG. Gender differences in nonverbal communication of emotion. In: Fischer, AH., editor. *Gender and emotion: Social and psychological perspectives*. Cambridge University Press; New York: 2000. p. 97-117.
- Helgeson VS, Cohen S, Schulz R, Yasko J. Education and peer discussion group interventions and adjustment to breast cancer. *Archives of General Psychiatry*. 1999; 56:340-347. [PubMed: 10197829]
- Helgeson VS, Reynolds KA, Tomich PL. A meta-analytic review of benefit finding and growth. *Journal of Consulting and Clinical Psychology*. 2006; 74:797-816. [PubMed: 17032085]
- King MT, Kenny P, Shiell A, Hall J, Boyages J. Quality of life three months and one year after first treatment for early stage breast cancer: Influence of treatment and patient characteristics. *Quality of Life Research*. 2000; 9:789-800. [PubMed: 11297021]
- Lehman DR, Davis CG, DeLongis A, Wortman CB, Bluck S, Mandel DR, et al. Positive and negative life changes following bereavement and their relations to adjustment. *Journal of Social and Clinical Psychology*. 1993; 12:90-112.
- Letzring TD, Wells SM, Funder DC. Information quantity and quality affect the realistic accuracy of personality judgment. *Journal of Personality and Social Psychology*. 2006; 91:111-123. [PubMed: 16834483]
- Linley PA, Joseph S. Positive change following trauma and adversity: A review. *Journal of Traumatic Stress*. 2004; 17:11-21. [PubMed: 15027788]
- McFarland C, Alvaro C. The impact of motivation on temporal comparisons: Coping with traumatic events by perceiving personal growth. *Journal of Personality and Social Psychology*. 2000; 79:327-343. [PubMed: 10981837]
- McMillen JC, Cook CL. The positive by-products of spinal cord injury and their correlates. *Rehabilitation Psychology*. 2003; 48:77-85.
- Park CL. The notion of growth following stressful life experiences: Problems and prospects. *Psychological Inquiry*. 2004; 15:69-76.
- Park CL, Cohen LH, Murch RL. Assessment and prediction of stress-related growth. *Journal of Personality*. 1996; 64:71-105. [PubMed: 8656319]
- Park CL, Fenster JR. Stress-related growth: Predictors of occurrence and correlates with psychological adjustment. *Journal of Social and Clinical Psychology*. 2004; 23:195-215.
- Ranchor AV, Sanderman R, Steptoe A, Wardle J, Miedema I, Ormel J. Pre-morbid predictors of psychological adjustment to cancer. *Quality of Life Research*. 2002; 11:101-113. [PubMed: 12018734]
- Rosip JC, Hall JA. Knowledge of nonverbal cues, gender, and nonverbal decoding accuracy. *Journal of Nonverbal Behavior*. 2004; 28:267-286.
- Schag, CAC., Heinrich, RL. *CARES Cancer rehabilitation evaluation system*. Cares Consultants; Santa Monica, CA: 1988.
- Sears SR, Stanton AL, Danoff-Burg S. The yellow brick road and the emerald city: Benefit finding, positive reappraisal coping, and posttraumatic growth in women with early-stage breast cancer. *Journal of Consulting and Clinical Psychology*. 2003; 22:487-497.
- Stanton, AL., Bower, JE., Low, CA. Posttraumatic growth after cancer. In: Calhoun, LG., Tedeschi, RG., editors. *Handbook of posttraumatic growth: Research & practice*. Lawrence Erlbaum Associates; Mahwah, NJ: 2006. p. 138-175.

- Taylor SE. Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist*. 1983; 38:1161–1173.
- Tedeschi, RG., Calhoun, LG. *Trauma and transformation: Growing in the aftermath of suffering*. Sage; Thousand Oaks, CA: 1995.
- Tedeschi RG, Calhoun LG. The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*. 1996; 9:455–471. [PubMed: 8827649]
- Tomich PL, Helgeson VS. Five years later: A cross-sectional comparison of breast cancer survivors with healthy women. *Psycho-Oncology*. 2002; 11:154–169. [PubMed: 11921331]
- Tomich PL, Helgeson VS. Is finding something good in the bad always good? Benefit finding among women with breast cancer. *Health Psychology*. 2004; 23:16–23. [PubMed: 14756599]
- Ware, JE., Snow, KK., Kosinski, M., Gandek, B. *SF-36 Health Survey: Manual and interpretation guide*. New England Medical Center, The Health Institute; Boston: 1993.
- Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*. 1988; 54:1063–1070. [PubMed: 3397865]
- Weinrib A, Rothrock NE, Johnsen EL, Lutgendorf SK. The assessment and validity of stress-related growth in a community-based sample. *Journal of Consulting and Clinical Psychology*. 2006; 74:851–858. [PubMed: 17032089]
- Weiss T. Posttraumatic growth in women with breast cancer and their husbands: An intersubjective validation study. *Journal of Psychosocial Oncology*. 2002; 20:65–80.
- Wells KB, Stewart A, Hays RD, Burnam MA, Rogers W, Daniels M, Berry S, Greenfield S, Ware J. The functioning and well-being of depressed patients. Results from the Medical Outcomes Study. *Journal of the American Medical Association*. 1989; 262:914–919. [PubMed: 2754791]
- Wood, R., Wilson, D., Gibbons, R., Schilling, S., Muraki, E., Bock, D. *TestFact 4: Classical item and item factor analysis*. Scientific Software International; Lincolnwood, IL: 2003.
- Wortman CB. Posttraumatic growth: Progress and problems. *Psychological Inquiry*. 2004; 15:81–92.

Figure 1.
Survivor and SO reports of positive and negative changes.

Figure 2.
Survivor and SO reports of survivor BFS scores: A comparison of spouse and nonspouse SOs.

Table 1

Demographic Characteristics of 10-Year Sample and Initial Sample

	10-Year Sample	Initial Sample
	<i>n</i> = 180	<i>n</i> = 364
support intervention:	19% peer	20%
	19% education	22%
	24% combined	23%
	23% randomized control	21%
	14% opted out of randomization	14%
age:	<i>M</i> = 59.43 (range 38 to 85)	<i>M</i> = 48.25 (27 to 75)
marital status:	66% married	69%
	1% living with partner	
	12% widowed	7%
	15% divorced/separated	15%
	7% single/never married	9%
race:	97% Caucasian	93%
	3% African American	6%
	1% Hispanic	1%
education:	2% less than high school	4
	34% high school grad	33
	25% some college	26
	25% college grad	23
	15% post-graduate education	14
surgery:	68% lumpectomy	69
	31% mastectomy	30
	2% bilateral mastectomy	1
stage:	33% stage 1	25
	63% stage 2	69
	3% stage 3	6

Table 2

Relationship of Significant Other to Survivor

	Percentage	<i>n</i>	Male	Female
<i>Relationship:</i>				
spouse	57%	102	101	1
child	16%	29	8	21
parent	7%	12	1	11
friend	7%	12	0	12
other relative	13%	24	0	24
other	1%	1	0	1

Open-Ended Responses to Long-lasting Effects of Breast Cancer

Table 3

	kappa	Survivor %	SO %	McNemar <i>p</i>	spouse kappa	nonspouse kappa	spouse McNemar <i>p</i>	nonspouse McNemar <i>p</i>
health behavior	.01	46.1	39.4	.241	.01	.05	.011	.324
appreciation of life	.00	41.7	26.7	.004	.02	-.01	.003	.405
positive relationship changes	.01	23.9	8.9	.000	-.03	.08	.000	.503
positive emotional changes	.10	22.2	20.0	.683	.11	.07	.108	.458
being more communal	.10	21.1	11.7	.016	.23	-.07	.134	.093
fear of recurrence/death	.04	18.9	31.1	.009	.03	.06	.053	.122
negative physical health	.14	18.9	16.1	.551	.20	.04	.076	.359
help others with cancer	.20	17.8	17.8	1.00	.22	.18	.832	.824
more relaxed	-.01	17.2	3.9	.000	-.05	.03	.003	.021
spirituality	.10	17.2	3.9	.000	.10	.10	.003	.006
negative selfimage	.17	13.9	13.3	1.00	.15	.15	.701	.289
concern for family health	-.02	10.6	6.7	.265	-.01	-.06	.648	.344
negative emotional changes	.16	6.1	17.2	.001	.21	.12	.021	.021