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# Sense of Control and Adjustment to Breast Cancer: The Importance of Balancing Control Coping Styles

John A. Astin, PhD; Hoda Anton-Culver, PhD; Carolyn E. Schwartz, ScD; Deane H. Shapiro, Jr, PhD; Jim McQuade, MD; Anne Marie Breuer, BS; Thomas H. Taylor, PhD; Hang Lee, PhD; Tom Kurosaki, MS

*The relationship of modes of control and desire for control to psychosocial adjustment in women with breast cancer was examined. Fifty-eight women with stage I or stage II breast cancer were surveyed shortly after their diagnosis and again 4 and 8 months later. The authors hypothesized that a control profile in which individuals use a positive yielding (ie, accepting) mode of control in conjunction with an assertive mode results in better adjustment than relying exclusively or primarily on an assertive mode. Results lend preliminary support to this hypothesis. At 8-month follow-up, those women who had a high desire for control and were low in positive yielding control showed the poorest adjustment, whereas those high in desire and the positive yielding mode showed the best psychosocial adjustment. The findings suggest that balanced use of active and yielding control efforts may lead to optimal psychosocial adjustment and quality of life in the face of life-threatening illnesses.*

**Index Terms:** breast cancer, psychosocial adjustment, quality of life, sense of control

Breast cancer is the most common type of cancer among American women. Nearly 200,000 new cases are diagnosed every year in the United States, and the lifetime risk of developing breast cancer is 1 in 8.<sup>1,2</sup>

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The diagnosis of breast cancer can cause feelings of helplessness and loss of control<sup>3,4</sup> that have been found to be related to anxiety, depression, and poor prognosis among cancer patients.<sup>5-7</sup> Some individuals, however, are able to maintain a sense of well-being in the face of a diagnosis of breast cancer. This well-being seems to be related to a positive sense of control that is based on their reactions to the diagnoses<sup>7</sup> as well as to the differential use of specific coping strategies over time.<sup>8-10</sup> Taylor<sup>11</sup> noted that control was important in adjustment to breast cancer, whether that sense of control came from personal agency or from a belief that one's physicians or treatments could control the disease. In addition, Ell and colleagues<sup>12</sup> found that personal sense of control was the only psychosocial factor significantly related to adaptation at 6-month follow-up.

We have argued elsewhere<sup>13,14</sup> that the relationship between control and health outcomes may not be a simple, linear one: that is, "control is good and the more one has the

better.” Research suggests that Western psychology’s understanding of control as active and instrumental has many culture-bound features<sup>15,16</sup> and is not always helpful or desirable.<sup>17–20</sup> This decisive, instrumental mode of control—the so-called fighting spirit attitude referred to in cancer research focusing on control—is typically contrasted with a negative, yielding mode—a timid, passive, helpless, resigned, and avoidant coping style.<sup>3,21–24</sup> This bias toward active control is reflected in most psychological control assessment inventories and coping questionnaires that do not distinguish between what we refer to as positive yielding (acceptance) and negative yielding (resignation or passivity).<sup>13</sup>

The emphasis on gaining active control, particularly in the face of situations and illnesses that may be beyond one’s ability to control, can lead to feelings of undue personal responsibility, blame, and guilt.<sup>25–28</sup> Furthermore, research also suggests that a greater sense of or belief in one’s ability to control and an excessive desire for control may sometimes actually suppress, rather than enhance, immune function<sup>29</sup> and may heighten rather than attenuate cardiovascular reactivity and risk.<sup>30–32</sup> Such studies point to the importance of considering the potential negative health consequences of desiring and gaining control.

The Shapiro Control Inventory (SCI),<sup>33</sup> which builds on the work of previous control researchers, was developed to operationalize the following components of control identified in the literature: sense of control in both general and specific domains, agency or source of control (ie, from self/other), and desire for control. In addition, the SCI extends previous research to include measurement of the following four distinct modes or characteristic ways of gaining a sense of control:

- *Positive assertive*: active instrumental control, in which one attempts to alter oneself or the environment
- *Positive yielding*: acceptance, in which one is able to let go of active control efforts and accept the situation or oneself without resignation or helplessness
- *Negative assertive*: overcontrol, in which one uses active control efforts excessively or inappropriately
- *Negative yielding*: passivity, in which one is fatalistic or feels helpless and fails to use active control efforts when they can or should be used

The SCI has been validated over the course of 2 decades on numerous clinical and normative populations.<sup>13,33</sup> We used it in our current study to explore the dynamic role that control-related coping can play on quality-of-life outcomes in patients with breast cancer.

We sought to test the following hypotheses, using the SCI: (a) although use of a positive assertive mode of control

is important for coping effectively with breast cancer, the ability to use both the positive assertive *and* yielding/accepting modes (what we term “optimal control”<sup>13</sup>) will result in better psychosocial adjustment to the disease; (b) theoretical and clinical work suggests that desire for control, an important component of healthy psychological function, can become excessive and maladaptive, particularly when not balanced by a willingness to let go of active control efforts when appropriate (ie, positive yielding).<sup>13</sup> Therefore, we hypothesized that when desire for control is not balanced by the yielding mode of control, patients will also show evidence of poorer adjustment to the disease.

## METHOD

### Participants

Sixty-four women diagnosed with first-time breast cancer were invited to participate in a consecutive series study; 62 (96.8%) agreed to participate, and 58 (91%) provided complete data. Participants were relatively affluent and the majority had in situ malignancies (see Table 1). Five participants refused to list their income. Rather than drop these patients from the analysis, we used the sample’s mean economic level (ie, \$62,200) for their income in our analyses.

### Procedures and Data Collection

We recruited participants from three private cancer centers in Orange County, California. We explained the study procedures and obtained their informed consent for participation in the project. The research associate (AMB) scheduled individual appointments at each participant’s convenience and administered the measures at that time. She remained present to answer any questions and to collect the completed questionnaires. We collected data from all participants within 6 weeks of diagnosis, again 4 months after the initial diagnosis, and, finally, 8 months after diagnosis to explore the impact of control soon after diagnosis, during active treatment, and immediately following treatment.<sup>34</sup>

### Measures

We operationalized psychosocial adjustment as functional living, self-reported depressive symptoms, and anxiety symptoms. We used the Functional Living Index—Cancer (FLIC) to assess functional living. The FLIC is a 22-item Likert-type scale that measures endorsement of four factors associated with functional status: (a) physical well-being (eg, “How much nausea have you had in the past 2 weeks?”); (b) psychological state (eg, “Rate how often you feel discouraged about your life?”); (c) family situation (eg, “Rate how willing you were to see and spend time with

**TABLE 1**  
**Sociodemographic Data of Sample of Breast Cancer Patients, at Baseline (N = 58)**

Variable	Measure
Age (y)	
<i>M</i>	53.5
<i>SD</i>	11.3
Range	31–81
Income (\$)	
Median	35,000–50,000
Range	15,000–100,000
Marital status (%)	
Married	55.1
Divorced	22.4
Single	8.6
Widowed	12.1
Other	1.7
Education (y)	
<i>M</i>	14.2
<i>SD</i>	2.0
Range	8–18
Ethnicity (%)	
White	93.5
Hispanic	3.2
Asian	3.2
Stage of diagnosis (%)	
In situ, local	71.4
Regional, lymph node involvement	28.6
Type surgery (%)	
Lumpectomy	37.9
Mastectomy (single or double)	62.1

**TABLE 2**  
**Sample Items and Reliability of Control Subscales Used in Study of Breast Cancer Patients**

Subscale/ sample item	Test–retest reliability†
Positive Assertive	
Decisive‡	.84
Assertive	
Confident	
Positive Yielding	
Accepting	.74
Calm	
Letting go	
Negative Assertive	
Defensive	.73
Rigid	
Impatient	
Negative Yielding	
Indecisive	.57
Manipulated	
Dependent	
Desire for Control	
“I have a strong desire to be in control”	.74
“‘It is important for me to be in control of myself”	

† Averaged across three time points in the present study (ie, Time 1–Time 2; Time 2–Time 3; Time 1–Time 3).

‡ On mode scales, respondents were asked how well the word described them on a 4-point scale (from *not at all well* to *extremely well*).

those closest to you in the past 2 weeks”); and (d) social situation (eg, “Rate your satisfaction with your work and your jobs around the house in the past month”). Higher scores on the FLIC indicate better status. Face, construct, and concurrent validity have been demonstrated in previously published research.<sup>35,36</sup>

We used the Center for Epidemiologic Studies-Depression scale (CES-D) to measure depressive symptoms. The CES-D is a standardized 20-item questionnaire that assesses the frequency and severity of depressive symptoms over the past week.<sup>37–39</sup> Scores range from 0 to 60, with higher scores indicating more depressive symptoms.

To measure anxiety, we used the Hopkins Symptom Check List,<sup>40</sup> a subscale of the SCL-90. This 10-item measure evaluates the severity of anxiety symptoms over the past week; scores range from 0 to 40, with higher scores indicating more anxiety symptoms.

We used the 187-item Shapiro Control Inventory (SCI),

which contains 9 subscales (see Shapiro<sup>33</sup> for details), to measure control. For the present study, we examined only the 5 subscales that were most germane to the theory we were testing regarding the importance of a balance between active–assertive and yielding strategies for gaining a sense of control. The 5 subscales included the four modes of control (positive assertive, negative assertive, positive yielding, negative yielding) and desire for control. Many studies have shown that the internal reliability of these subscales range from .70 to .89; test-retest reliability ranges from .67 to .93.<sup>33,41,42</sup> Research has also demonstrated the SCI’s discriminant, divergent, incremental, and construct validity.<sup>43–46</sup>

The 5 control subscales, sample items from each subscale, and test-retest reliability coefficients from the present study sample are shown in Table 2. Although the control subscales we examined in our study show some degree of intercorrelation, rater reliability studies<sup>47</sup> and factor analytic studies<sup>48</sup> suggest that they are measuring distinct constructs.<sup>33</sup>

**TABLE 3**  
**Intercorrelations of Control Components and Dependent Measures at Time Point 1**

Component	1	2	3	4	5	6	7	8
1. FLIC	—							
2. Depression	-.65**	—						
3. Anxiety	-.60	.76**	—					
4. Positive Assertive	.03	-.07	.01	—				
5. Positive Yielding	.28*	-.33*	-.20	.51**	—			
6. Negative Assertive	-.09	.26	.11	.04	-.25	—		
7. Negative Yielding	-.14	.13	.03	-.14	.15	.20	—	
8. Desire for Control	-.13	.12	.19	.08	-.34**	.27*	-.23	—

Note. FLIC = Functional Living Index-Cancer.  
 \*  $p < .05$ ; \*\*  $p < .01$ .

**Statistical Analysis**

We carried out multiple regression analyses to examine the degree to which initial measures on the different control parameters predicted psychosocial adjustment to breast cancer longitudinally at approximately 4 and 8 months postdiagnosis. To examine the relationship between demographic variables, stage of cancer, treatment type, and the outcome variables, we calculated bivariate correlations.

Age and education were the two variables with significant correlations and were therefore entered as covariates in the multiple regression. We also entered scores on the outcome variables from the first time point (within 6 weeks of diagnosis) as covariates in subsequent multiple regression models.

To examine our hypotheses, we also entered two specific interactions: (a) positive assertive with positive yielding and (b) desire for control with positive yielding into the regression models. So that we could test our theory properly, we entered these interaction terms after adjusting for main effects, regardless of the statistical significance of the main effects. SPSS (version 6.1.1) was the software we used for all analyses.

**RESULTS**

The bivariate correlations between the five control parameters we tested and the three outcome variables at the first assessment are shown in Table 3. Higher scores on the positive yielding mode were associated with better initial adjustment measured by both the FLIC and depression scales ( $p < .05$ ). Four months after the initial interview (Time Point 2), we found no significant relationships between the control variables at Time Point 1 and psy-

chosocial adjustment, although all coefficients were in the expected direction.

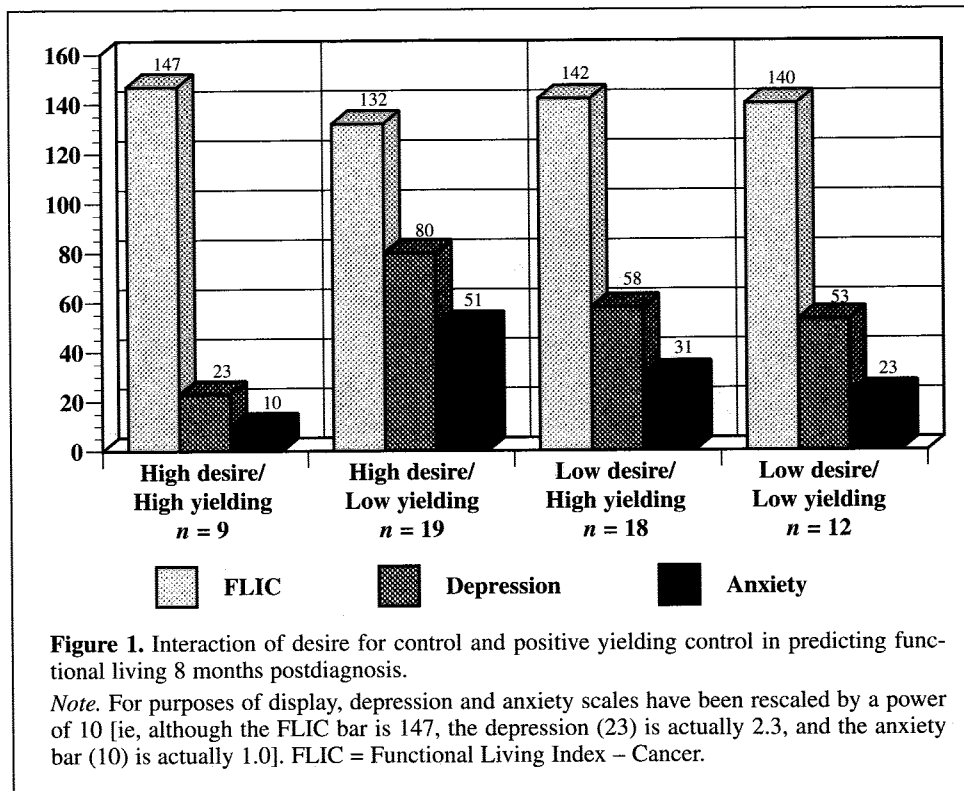
Eight months after the initial interview, there was, as hypothesized, a significant interaction between desire for control and the positive yielding mode of control on adjustment measured by the FLIC (see Table 4). Those patients who were high in desire for control and low in the yielding mode showed the poorest adjustment (FLIC = 132), whereas those who were high in desire and yielding control gave evidence of the best adjustment (FLIC = 147; see Figure 1). As one can also see in Figure 1, the interaction between desire for control and the positive yielding mode also showed a similar, though nonsignificant, pattern for both the measures of depression ( $p = .06$ ) and anxiety ( $p = .10$ ).

We observed a similar, though not significant, trend for the other interaction term (Figure 2). Those breast cancer

**TABLE 4**  
**Effects of Control on Quality of Life (FLIC)**  
**8 Months Postdiagnosis**

Independent variable†	$\beta$	$F$	$p$
FLIC	.49	23.32	< .001
Positive Yielding	-1.6	6.55	< .05
Desire for Control	-1.9	8.94	< .01
Interaction of Desire/ Positive Yielding	1.9	7.23	< .01

Note. Overall  $R^2 = .51$ . FLIC = Functional Living Index-Cancer.  
 † Measured at Time Point 1.



patients high in positive assertive control but low in the yielding mode showed the poorest adjustment (on all three outcome measures), whereas those high in both of these modes of control gave evidence of the best adjustment (on both the FLIC and depression scales). One plausible explanation for this interaction's not reaching significance is that it was entered as a standard multiplicative term, one that assumes the variables are mutually reinforcing, which was not the case with these two modes of control. That is, those who scored high on assertive and low on yielding actually showed poorer adjustment than those scoring low on both variables.

In this case, using a dummy variable would provide a better test of our hypothesis. Therefore, we performed a post hoc analysis in which we entered the combination of high assertive/low yielding control as a dummy variable in the regression equation, adjusting for main effects. Results showed that this interaction *did* predict poorer adjustment on anxiety levels 8 months after the initial interview ( $p < .01$ ) and functional living ( $p = .05$ ; data not shown).

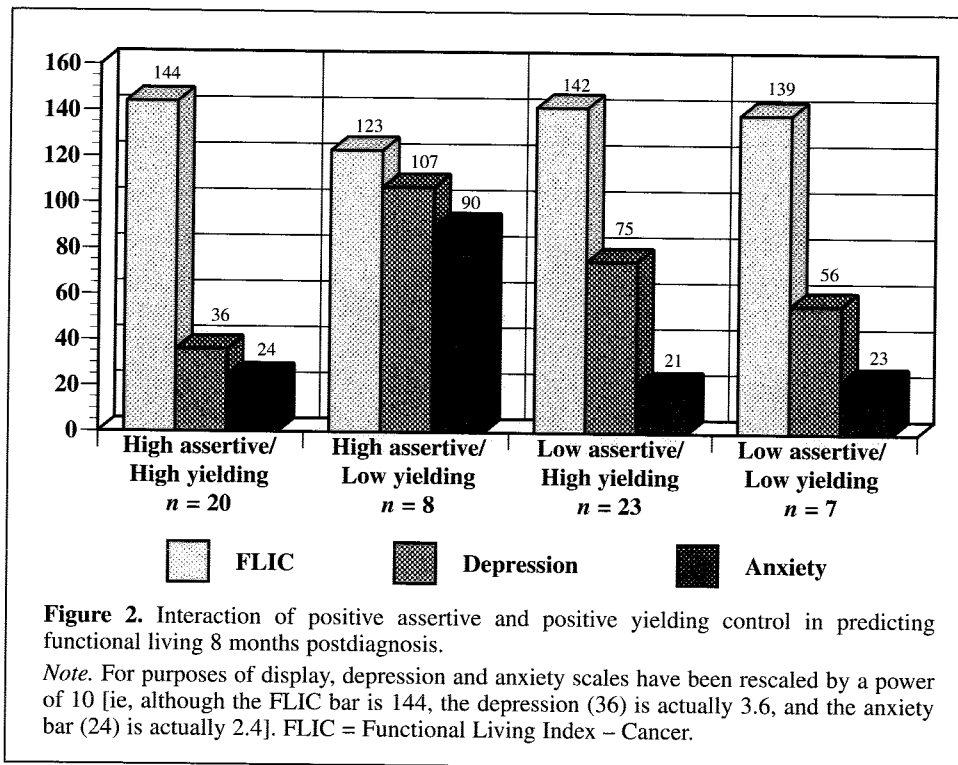
**COMMENT**

The significant interaction between desire for control and positive yielding lends partial support to the hypothesis that

balancing active control efforts and desire for control<sup>13,14</sup> with the positive yielding mode of control leads to better psychosocial adjustment. Although greater desire for control tended to be associated with poorer adjustment, those women whose desire for control was coupled with or balanced by an ability to use the yielding mode of control actually showed the best psychosocial adjustment.

The interaction between positive assertive and positive yielding control was not significant. However, as noted above, post hoc analyses (using a dummy variable rather than a multiplicative term) did suggest an interaction between these two modes of control that supports our hypothesis. That is, those women who were high in assertive *and* yielding control gave evidence of the best adjustment, whereas those scoring high on assertive control and low on yielding control showed the poorest overall adjustment.

We should note that the particular nature of the interaction between the assertive and yielding modes suggests a relationship between these variables that our theory would not necessarily have predicted. Findings from our clinical and theoretical work<sup>13</sup> suggest that although a combination of both positive modes is optimal, active and yielding control efforts are important and contribute to psychological



health and well-being. However, in the present study, having relatively low levels of positive yielding actually appeared to negate any of the beneficial effects of the positive assertive mode.

For those women with lower levels of the yielding mode of control, being high in the positive assertive mode was associated with the poorest adjustment to the disease. It remains for future research to examine these findings in greater detail and with different study populations, but the results suggest that an assertive (“fighting spirit”) mode of control can, under certain circumstances, be unhealthy or maladaptive if one is not also able to let go of active control efforts when appropriate (ie, positive yielding).

**SUMMARY**

In the present study, we attempted to build upon earlier work examining the relationship of sense of control and control-related coping styles to psychosocial adjustment in breast cancer patients. Through the use of a multidimensional measure of control (the SCI) that draws upon and integrates components of control previously identified in the literature, we have explored how several control-related constructs predict psychosocial adjustment after a positive diagnosis of the disease, as well as 4 and 8 months later. Previous research findings suggest that adopting a fighting

spirit toward the illness (“I am determined to beat this disease. . . .”) is psychologically adaptive, whereas denial or fatalism is maladaptive.<sup>24</sup> Such studies have added substantially to our understanding of the relationship between control-related coping and adjustment in the face of such illnesses.

Research also suggests, however, that the relationship between control and health outcomes is considerably more complex and less linear than was previously thought. For example, our theory suggests that assertive control can have maladaptive components—hence the terms *negative assertive control* and *overcontrol*. Furthermore, yielding or acceptance is not always maladaptive and can, in fact, promote psychosocial health and well-being—hence our use of the term *positive yielding control*.<sup>13,14</sup>

Findings from the present study lend preliminary support to the above hypotheses and suggest that an optimal control profile in response to a stressful life experience, such as cancer, is reflected in a balanced and flexible use of positive assertive and positive yielding modes of control.

**Study Limitations**

This study was limited in several important ways. First, we had no true baseline measures of either the control variables or the psychosocial adjustment measures. The initial



scores cannot be considered as true baseline values because participants had already received a diagnosis and were undoubtedly reacting to it emotionally and behaviorally. Our theory predicts that, by definition, those exhibiting a more positive control profile would tend to show less depression and anxiety and higher quality of life scores before such a diagnosis. Unfortunately, the study design did not permit collection of such data.

Second, although this study had enough statistical power to detect moderate to large effect sizes,<sup>49</sup> it is still possible that we may have underestimated the effects of control on adjustment. That is, there may have been subtle effects of control on adjustment that were not detected. Third, the generalizability of the findings is limited by the study sample, which was composed primarily of White and relatively affluent women. Fourth, the study relied exclusively on self-reported levels of psychosocial adjustment that do not always correspond to objective indices.<sup>50</sup>

### Broader Implications and Future Directions

We have previously reviewed the extensive literature suggesting that sense of control may mediate the adverse physiological effects of stressful life events and may enhance recovery from illness.<sup>13,14,51</sup> In addition, we<sup>13</sup> and others<sup>52</sup> have argued that feelings of loss of control and lack of control and the corresponding maladaptive efforts to regain a sense of control are at the root of most issues brought to psychotherapists and mental health professionals. This large and convincing body of evidence in the fields of health psychology and behavioral medicine points to the importance of control in both mental and physical health.<sup>51</sup> We believe, therefore, that the present study has both theoretical and clinical implications that may extend beyond the specific domain of coping with breast cancer.

Our present study, for example, suggests that the use of such measures as the SCI can help identify active control efforts that can be maladaptive. It also points to the potential importance of balancing assertive *and* accepting control coping strategies when confronted with illness and challenging or stressful life events in general. Such measurement refinement may help clarify seemingly contradictory findings in the literature that suggest that control can have both positive and negative effects on physiological functioning and quality of life.<sup>13,14</sup>

More careful measurement of the construct of control in health-related research may also help clarify the circumstances under which having a high desire for control and using active or assertive control efforts is adaptive. It may clarify the specific circumstances in which a desire for control and active control efforts might represent or underlie

maladaptive behavioral responses (eg, hostility) that have been shown to have important health implications. More careful and refined measurement of control could also help inform the debate about circumstances under which illusory or exaggerated perceptions of control represent healthy and adaptive psychosocial functioning.<sup>53,54</sup>

Finally, earlier studies also suggest that a low sense of control and feelings of helplessness are related to poor prognosis in cancer<sup>55,56</sup> and are significant predictors of first recurrence and death from the disease.<sup>57,58</sup> Given our findings in the present study, it will be important for future researchers to examine whether a balanced use of assertive and yielding modes of control and coping styles might also positively influence immune function and disease recurrence.

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### NOTE

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### REFERENCES

1. Boring CC, Squires TS, Tong T. Cancer statistics, 1993. *CA Cancer J Clin.* 1993;43:7-26.
2. *Cancer Facts and Figures.* Atlanta: American Cancer Society; 1996.
3. Andersen BL, Kiecolt-Glaser JK, Glaser R. A biobehavioral model of cancer stress and disease course. *Am Psychol.* 1994;49:389-404.
4. Peterson C, Stunkard AJ. Personal control and health promotion. *Soc Sci Med.* 1989;28:819-828.
5. Watson M, Greer S, Rowden L, et al. Relationships between emotional control, adjustment to cancer and depression and anxiety in breast cancer patients. *Psychol Med.* 1991;21:51-57.
6. Stanton AL, Snider PR. Coping with a breast cancer diagnosis: A prospective study. *Health Psychol.* 1993;12:16-23.
7. Burgess C, Morris T, Pettingale KW. Psychological response to cancer diagnosis-II. Evidence for coping styles (coping styles and cancer diagnosis). *J Psychosom Res.* 1988;32:263-272.

8. Heim E, Augustiny KF, Blaser A, et al. Coping with breast cancer—A longitudinal prospective study. *Psychother Psychosom.* 1987;48:44–59.
9. Cunningham AJ, Lockwood GA, Cunningham JA. A relationship between perceived self-efficacy and quality of life in cancer patients. *Patient Educ Couns.* 1991;17:71–78.
10. Taylor SE, Lichtman RR, Wood JV. Attributions, beliefs about control, and adjustment to breast cancer. *J Pers Soc Psychol.* 1984;46:489–502.
11. Taylor SE. Adjustment to threatening events: A theory of cognitive adaptation. *Am Psychol.* 1983;38:1161–1173.
12. Ell K, Nishimoto R, Morvay T, Mantell J, Hamovitch M. A longitudinal analysis of psychological adaptation among survivors of cancer. *Cancer.* 1989;63:406–413.
13. Shapiro DH Jr, Astin JA. *Control Therapy: An Integrated Approach to Psychotherapy, Health, and Healing.* New York: John Wiley & Sons; 1998.
14. Shapiro DH Jr, Schwartz CE, Astin JA. Controlling ourselves, controlling our world: Psychology's role in understanding positive and negative consequences of seeking and gaining control. *Am Psychol.* 1996;51:1213–1230.
15. Averill JR. Personal control over aversive stimuli and its relationship to stress. *Psychol Bull.* 1973;80:286–303.
16. Evans GW, Shapiro DH, Lewis MA. Specifying dysfunctional mismatches between different control dimensions. *Br J Psychol.* 1993;84:255–273.
17. Shapiro DH, Evans G, Shapiro J. Human control. *Science.* 1987;238:260.
18. Burger JM. Negative reactions to increases in perceived personal control. *J Pers Soc Psychol.* 1989;56:246–256.
19. Thompson SC, Cheek PR, Graham MA. The other side of perceived control: Disadvantages and negative effects. In: Spacapan SOE, ed. *The Social Psychology of Health. The Claremont Symposium on Applied Social Psychology.* Newbury Park, CA: Sage; 1988:69–93.
20. Weisz JR, Rothbaum FM, Blackburn TC. Standing out and standing in: The psychology of control in America and Japan. *Am Psychol.* 1984;39:955–969.
21. Burger JM, Cooper HM. The desirability of control. *Motivation & Emotion.* 1979;3:381–393.
22. Roth S, Cohen L. Approach, avoidance, and coping with stress. *Am Psychol.* 1986;41:813–819.
23. Suls J, Fletcher B. The relative efficacy of avoidant and non-avoidant coping strategies: A meta-analysis. *Health Psychol.* 1985;4:249–288.
24. Classen C, Koopman C, Angell K, Spiegel D. Coping styles associated with psychological adjustment to advanced breast cancer. *Health Psychol.* 1996;15:434–437.
25. Brownell KD. Personal responsibility and control over our bodies: When expectation exceeds reality. *Health Psychol.* 1991;10:303–310.
26. Spiegel D. A psychosocial intervention and survival time of patients with metastatic breast cancer. *Advances.* 1991; 7:10–19.
27. Wilber K. *Grace and Grit.* Boston: Shambhala; 1991.
28. Gray RE, Doan BD. Heroic self-healing and cancer: Clinical issues for the health professions. *J Palliat Care.* 1990;6: 32–41.
29. Weisse CS, Pato CN, McAllister CG, et al. Differential effects of controllable and uncontrollable acute stress on lymphocyte proliferation and leukocyte percentages in humans. *Brain Behav Immun.* 1990;4:339–351.
30. Glass DC. Stress, behavior patterns, and coronary disease. *American Scientist.* 1977;65:177–187.
31. Seeman TE. Personal control and coronary artery disease: How generalized expectancies about control may influence disease risk. *J Psychosom Res.* 1991;35:661–669.
32. Houston BK, Chesney MA, Black GW, Cates DS, Hecker MH. Behavioral clusters and coronary heart disease risk. *Psychosom Med.* 1992;54:447–461.
33. Shapiro DH. *Manual for the Shapiro Control Inventory (SCI).* Palo Alto: Behaviordata; 1994.
34. Nayfield SG, Ganz PA, Moynour CM, Cella DF, Hailey BJ. Report from a National Cancer Institute (USA) workshop on quality of life assessment in cancer clinical trials. *Qual Life Res.* 1992;1:203–210.
35. Schipper H. Guidelines and caveats for quality of life measurement in clinical practice and research. *Oncology.* 1990;4:51–57.
36. Schipper H, Clinch J, McMurray A, Levitt M. Measuring the quality of life of cancer patients: The Functional Living Index-Cancer: Development and validation. *J Clin Oncol.* 1984;2:472–483.
37. Comstock GW, Helsing KJ. Symptoms of depression in two communities. *Psychol Med.* 1976;6:551–563.
38. Weissman MM, Sholomskas D, Pottenger M, Prusoff BA, Locke BZ. Assessing depressive symptoms in five psychiatric populations: A validation study. *Am J Epidemiol.* 1977;106:203–214.
39. Devins GM, Orme CM, Costello CG, Binik YM. Measuring depressive symptoms in illness populations: Psychometric properties of the Center for Epidemiologic Studies Depression (CES-D) scale. *Psychology & Health.* 1988;2:139–156.
40. Derogatis LR. *Hopkins Symptom Checklist.* Baltimore: Johns Hopkins University; 1975.
41. Shapiro DH, Weatherford V, Kaufman E, Broenen RE. A control profile of adult children of alcoholics: A preliminary investigation. *Am J Drug Alcohol Abuse.* 1994;20:247–262.
42. Shapiro DH, Blinder BJ, Hagman J, Pituck S. A psychological “sense-of-control” profile of patients with anorexia nervosa and bulimia nervosa. *Psychol Rep.* 1993;73:531–541.
43. Shapiro DH, Potkin SG, Jin Y, Brown B. Measuring the psychological construct of control: Discriminant, divergent, and incremental validity of the Shapiro Control Inventory and Rotter's and Wallstons' Locus of Control Scales. Special Issue: Dreams. *Int J Psychosomatics.* 1993;40:35–46.
44. Shapiro DH, Wu J, Hong C, Buchsbaum MS. Exploring the relationship between having control and losing control to

- functional neuroanatomy within the sleeping state. *Psychologia: An International Journal of Psychology in the Orient*. 1995;38:133–145.
46. Shapiro DH, Lindberg J, Daniels JM, Breuer AM, Astin JA. Assessing the relationship between a multidimensional psychological control profile and cardiovascular risk. *Int J Psychosomatics*. 1994;41:11–16.
  47. Shapiro DH. Reliability of a four-quadrant model of self-control: Ratings by experts in Type A behavior—Health psychology, East/West psychology, and sex role psychology. *Psychologia: An International Journal of Psychology in the Orient*. 1982;25:149–154.
  48. Shapiro DH. The relationship of self-control to psychological health and social desirability: Toward the development of normative scales for a clinical assessment inventory based on a control model of health. *Psychologia: An International Journal of Psychology in the Orient*. 1985;28:237–248.
  49. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale: Erlbaum; 1988.
  50. Schwartz CE, Kozora E, Zeng Q. Towards patient collaboration in cognitive assessment: Specificity, sensitivity, and incremental validity of self-report. *Ann Behav Med*. 1996; 18:177–184.
  51. Astin JA, Shapiro SL, Lee RA, Shapiro DH. The construct of control in mind-body medicine: Implications for healthcare. *Altern Ther Health Med*. 1999;5:42–47.
  52. Frank JD. Therapeutic components shared by all psychotherapies. In: Harvey JH, ed. *Psychotherapy Research and Behavior Change. Master Lecture Series, Vol 1*. Washington, DC: American Psychological Association, 1982:9–37.
  53. Colvin CR, Block J. Do positive illusions foster mental health? An examination of the Taylor and Brown formulation. *Psychol Bull*. 1994;116:3–20.
  54. Taylor SE, Brown JD. Positive illusions and well-being revisited: Separating fact from fiction. *Psychol Bull*. 1994;116: 21–27.
  55. Antoni MH, Goodkin K. Host moderator variables in the promotion of cervical neoplasia—Personality facets. *J Psychosom Res*. 1988;32:327–338. [Erratum. *J Psychosom Res*. 1989;33(3):391].
  56. DiClemente RJ, Temoshok L. Psychological adjustments to having cutaneous malignant melanoma as a predictor of follow-up clinical status. *Psychosom Med*. 1985;47:81.
  57. Greer S, Morris T, Pettingale KW. Psychological response to breast cancer: Effect on outcome. *Lancet*. 1979; 12:785–787.
  58. Pettingale KW, Morris T, Greer S, Haybittle JL. Mental attitudes to cancer: An additional prognostic factor [letter]. *Lancet*. 1985;1:750.

#### SOCIAL CAUSATION OF DISEASE

Biological mechanisms that mediate individual responses to stress will be the focus of the Berzelius Symposia 50 in Stockholm, May 10–12, 2000. Speakers will bring different perspectives to the program, which will address both the epidemiologic background and pathophysiological mechanisms linked to psychosocial stress.

Individual session titles, according to the Swedish Society of Medicine's announcement, will be

- Social Association to Disease: The Epidemiological Panorama
- Stress Models and Biophysiological Mechanisms
- Stress Consequences: The Metabolic Syndrome
- Social Determinants of Accelerated Versus Normal Aging
- Gene-Environment Interaction in a Social Context
- Psychosocial Stress and Gender-Related Factors
- Regeneration and Repair: Focus on Sleep, Hormones, and Social Factors

The sessions will end with a panel discussion of implications of the topics for society, research, and action. Speakers from Sweden, the United Kingdom, the United States, Germany, Spain, and Denmark will lead the discussions, which will be in English.

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