Journal of Consulting and Clinical Psychology
2003, Vol. 71, No. 6, 1036–1048

0022-006X/03/$12.00 DOI: 10.1037/0022-006X.71.6.1036

Project Genesis: Assessing the Efficacy of Problem-Solving Therapy for Distressed Adult Cancer Patients

Arthur M. Nezu and Christine Maguth Nezu
Drexel University

Stephanie H. Felgoise
Philadelphia College of Osteopathic Medicine

Kelly S. McClure
Children's Hospital of Philadelphia

Peter S. Houts
Johns Hopkins University

The efficacy of problem-solving therapy (PST) to reduce psychological distress was assessed among a sample of 132 adult cancer patients. A second condition provided PST for both the patient and a significant other. At posttreatment, all participants receiving PST fared significantly better than waiting list control patients. Further, improvements in problem solving were found to correlate significantly with improvements in psychological distress and overall quality of life. No differences in symptom reduction were identified between the 2 treatment protocols. At a 6-month follow-up, however, patients who received PST along with their significant other reported lower levels of psychological distress as compared with members of the PST-alone condition on approximately half of the outcome measures. These effects were further maintained 1-year posttreatment.

Although considerable progress has been made in treating the set of diseases known as cancer, many cancer patients experience significant emotional distress despite actual medical improvement (A. M. Nezu, Lombardo, & Nezu, in press). Almost every aspect of one's life can be affected, as cancer engenders both acute and chronic stress, and if not remediated, often leads to lowered quality of life (Andersen, 2002). With regard to depression, for example, Mermelstein and Lesko (1992) found a fourfold increase in the rate of depression among oncology patients as compared with the general population. Other significant psychosocial problems experienced by these individuals include anxiety, suicide, delirium, body image problems, and sexual dysfunctions (A. M. Nezu, Nezu, Felgoise, & Zwick, 2003).

Given these significant negative consequences of cancer, the importance of developing and evaluating effective interventions to improve the quality of life of these patients and affect positively their psychological distress appears obvious. In fact, during the past two decades, a sufficiently large number of intervention studies have been conducted that both qualitative and quantitative reviews of this literature have become possible and meaningful (e.g., Baum & Andersen, 2001; Fawzy, Fawzy, Arndt, & Pasnau, 1995). The general conclusions that such reviews reached underscore the efficacy of a wide range of psychosocial interventions geared to improve the quality of life of adult cancer patients. For example, Meyer and Mark (1995) conducted a meta-analysis of 62 treatment-control comparisons and found the beneficial and significant effect sizes to be .24 for emotional adjustment measures, .19 for functional adjustment indices, .26 for measures of treatment and disease-related symptoms, and .28 for compound and global measures.

However, whereas such reviews highlight the general efficacy of various psychosocial interventions for this population, few empirical endeavors have been structured to provide information indicating which components are crucial in producing such positive effects (A. M. Nezu et al., 2003). For example, in 1992, Andersen noted that, barring only a few exceptions, outcome studies conducted up to that point had not provided for process measures of the intervention components. In 2002, in reviewing the outcome literature published during the decade since her earlier review, she noted the lack of improvement along these lines, and suggested that "it is too seldom that researchers articulate the theoretical case for their specific intervention components and the mechanisms by which a specific outcome are to be achieved" (Andersen, 2002, p. 603). In this context, the major purpose of the present study was to assess the efficacy of problem-solving therapy (PST), a clinical intervention approach aimed at increasing an individual's ability to cope with stressful problems.

The conceptual relevance of PST for persons with cancer is embedded in a general problem-solving model of stress (A. M. Nezu & D'Zurilla, 1989), whereby the experience of cancer is conceptualized both as a major negative life event and as the cause of a series of stressful daily problems and hassles (see A. M. Nezu, Nezu, Houts, Friedman, & Faddis, 1999, for a more detailed description of this model as applied to cancer). Both such sources

Arthur M. Nezu and Christine Maguth Nezu, Department of Psychology, Drexel University; Stephanie H. Felgoise, Department of Psychology, Philadelphia College of Osteopathic Medicine; Kelly S. McClure, Children's Hospital of Philadelphia; Peter S. Houts, Department of Oncology, Johns Hopkins University.

Kelly S. McClure is now at the Department of Psychology, La Salle University.

Project Genesis was supported by National Cancer Institute Grant R01-CA61313 awarded to Arthur M. Nezu.

Correspondence concerning this article should be addressed to Arthur M. Nezu, Department of Psychology, Mail Stop 515, Drexel University, 245 North 15th Street, Philadelphia, Pennsylvania 19102-1192. E-mail: art.nezu@verizon.net

of stress are further hypothesized to increase the likelihood that a cancer patient will experience significant psychological distress, including feelings of depression. However, one's problem-solving ability is conceptualized as an important moderator of these relationships, whereby effective problem-solving ability should attenuate the probability of experiencing distress, even when one is confronted by cancer-related stressful events. The core assumptions of this general model have been supported by research findings from both university students and clinical patient samples (Brack, LaClave, & Wyatt, 1992; Cheng, 2001; Frye & Goodman, 2000; Goodman, Gravitt, & Kaslow, 1995; Miner & Dowd, 1996; A. M. Nezu, 1986b; A. M. Nezu, Nezu, Saraydarian, Kalmar, & Ronan, 1986; A. M. Nezu, Perri, Nezu, & Mahoney, 1987; A. M. Nezu, Nezu, Faddis, DelliCarpini, & Houts, 1995; A. M. Nezu & Ronan, 1985, 1988; Priester & Clum, 1993), as well as from adult cancer patients (A. M. Nezu et al., 1995; C. M. Nezu et al., 1999). For example, A. M. Nezu et al. (1995) found that under similarly high levels of cancer-related stress, those patients who were characterized as ineffective problem solvers reported higher levels of depression as compared with their cancer-patient counterparts who were characterized as effective problem solvers.

The major implication of this model for treatment, then, suggests that providing PST to patients with cancer should increase their ability to cope more effectively and, therefore, should affect positively their distress and quality of life. This is in keeping with Andersen's (2001) biobehavioral model of cancer stress and disease course, which in part, underscores the importance of affecting a cancer patient's level of stress as a means of enhancing his or her quality of life and potentially improving the overall disease outcome. Previous research that has identified PST to be an efficacious clinical intervention for a variety of psychological disorders (see D'Zurilla & Nezu, 1999, for an overview of this literature), especially major depression (Arean et al., 1993; A. M. Nezu, 1986a; A. M. Nezu & Perri, 1989), offers additional support for the hypothesis that PST would be an efficacious intervention for such goals among adult cancer patients.

In addition, given the lack of tests in previous outcome studies on the mechanisms of action underlying specific clinical interventions for cancer patients (Andersen, 1992; A. M. Nezu et al., 2003), it was considered important to ask the following question directly: Are improvements in problem-solving effectiveness associated with decreases in psychological distress?

Another purpose of this study was to assess the potential added benefits of including a significant other (SO) in treatment. Although not a ubiquitous finding (e.g., Moore & Chaney, 1985), researchers in general have suggested that spouse involvement in the treatment of psychopathology (e.g., depression, agoraphobia, alcoholism) adds positively to the effects of a psychosocial intervention (Jacobson, Holtzworth-Munroe, & Schmaling, 1989). In addition, such studies converge with the literature underscoring the importance of social support in fostering improved psychosocial response to medical illnesses such as cancer (Manne, 2003). Elsewhere, we have argued theoretically that providing training in problem-solving skills to spouses or life partners of a cancer patient can improve their caregiver effectiveness as well as decrease their sense of burden (Houts, Nezu, Nezu, & Bucher, 1996). In this manner, spouses can help the cancer patient improve. Given these contexts, it was hypothesized that formalizing a social support system (i.e., including a patient-identified SO such as a spouse, life partner, or adult son or daughter in the training) would increase the treatment effects of PST by reinforcing and enhancing skill acquisition, fostering social support, and facilitating in vivo application of the problem-solving skills. In essence, this SO served both as a problem-solving coach and as a training buddy.

To test the above hypotheses, we conducted a prospective outcome study, entitled Project Genesis, whereby adult cancer patients experiencing significant psychological distress were randomly assigned to one of three treatment conditions: (a) PST, (b) PST with a significant other (PST–SO), and (c) waiting list control (WLC). Patients in each of these three conditions continued to receive standard medical care for their cancer treatment. Therefore, the specific research questions addressed in this study involved potential benefits of PST, PST–SO, or WLC above and beyond that attributable to standard medical care.

Method

Participants

Persons participating in this study included adults who were diagnosed with cancer within the 6 months prior to initial contact who were currently receiving some form of medical treatment for their cancer, were experiencing significant psychological distress, and met the study's other inclusion and exclusion criteria. This study took place at two different hospital sites, one in a major city (Philadelphia) and the second in a more rural area (Central Pennsylvania).

Inclusion and Exclusion Criteria

To be eligible to participate in this study, individuals needed to (a) be between the ages of 18 and 65; (b) meet the screening criteria for psychological distress; (c) be able to read English at least on a sixth-grade level; (d) be able to identify a person (e.g., spouse, life partner, adult son or daughter) willing to be an active participant in the study; (e) have a prognosis of a 5-year survival rate of 50% or greater as deemed by their oncologist, breast surgeon, or other relevant attending physician (suggesting a reasonable rate of cure or prolonged medical survival with state-of-the-art medical care and no Stage IV diagnosis); (f) receive a score of 70 or greater on the Karnofsky Performance Status Scale (Karnofsky & Burchenal, 1949); and (g) be willing to provide written informed consent to participate in the study, which included several clinical evaluations, provide access to medical records, and allow all interviews and PST treatment sessions to be audiotaped. The Karnofsky Performance Status Scale is a standard measure in oncology practice and research and represents an interviewer-rated instrument. This scale evaluates a patient's degree of impairment in physical activity and self-care. It is rated in deciles from 0 to 100, where 0 = *death* and 100 = *completely normal functioning*. Karnofsky Performance Status Scale scores of 70 and greater were included in this study as an inclusion criterion on the basis of previous research (e.g., Telch & Telch, 1986), suggesting that patients scoring below this cutoff score would be unable to fulfill study requirements.

The experience of significant psychological distress was not defined by any particular psychiatric diagnosis, but rather by clinical levels of distress symptomatology and adjustment difficulties. Specifically, this involved receiving (a) a *T* score of greater than or equal to 63 on the Global Severity Index (GSI) of the Brief Symptom Inventory (BSI; Derogatis, 1993) and (b) a score of 14 or greater on the Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960).

Exclusion criteria included the presence of (a) a certain known psychiatric disturbance existing prior to the diagnosis of cancer (i.e., diagnosis of bipolar disorder, psychosis, or borderline personality disorder), (b) a diagnosis of mental retardation, (c) acute suicidal behavior, and (d) current

receipt of either psychotherapy or drug treatment for emotional or psychological problems.

Recruitment and Screening Procedure

Referral sources for potential research participants included oncology-related services at both treatment sites and neighboring hospitals and cancer centers (e.g., radiation oncology, breast health centers, hematology and/or oncology, head and neck surgery) as well as at local cancer referral agencies (e.g., American Cancer Society). Interested individuals were initially provided a brief description of the clinical and research components of Project Genesis and invited to participate in an intake interview if they met various initial criteria with specific regard to the cancer diagnosis, verbal self-report of significant emotional distress, and ability to identify a potential SO who would likely consent to participate in the project.

During the intake session, individuals were given additional details concerning the research protocol and provided the opportunity to discuss possible ethical or clinical concerns. If a person was willing to continue in the screening process by providing written informed consent, he or she was then asked to undergo a 45-min semistructured clinical interview during which the assessor collected information necessary to complete the Karnofsky Performance Status Scale, the HRSD, and the Omega Vulnerability Rating Scales (Omega; Weisman, Worden, & Sobel, 1980). The cancer patient was also asked to identify a potential SO who might serve as a problem-solving coach if that person was assigned to the PST–SO condition. After the interview, participants were asked to complete a battery of self-report measures and provided with one measure (Katz Adjustment Scale, Relative's Form; KAS-R; Katz & Lyerly, 1963) to take home for their SO to complete independently and send back to the research team (see *Measures*).

Individuals who conducted the clinical interviews included advanced clinical psychology graduate students who had the equivalent of a master's degree and participated in a 10-hr training protocol led by either Arthur M. Nezu or Christine Maguth Nezu. Mock interviews were conducted as a means of training, and evaluators were provided feedback on their interview skills and ability to accurately complete the Karnofsky Performance Status Scale, HRSD, and Omega measures. All interviews (i.e., pretreatment, posttreatment, 6-month follow-up, and 1-year follow-up) were audiotaped. A random (stratified by assessment point) 35% of the tapes were independently rated by a second clinical evaluator to provide a second set of HRSD and Omega scores. Interrater reliability estimates for these measures across the four assessment points (baseline, posttreatment, 6-month follow-up, and 1-year follow-up) were found to be .89, .83, .92, and .88 for the HRSD and .92, .84, .88, and .84 for the Omega measure, respectively. In addition, Arthur M. Nezu randomly selected 30% of the baseline assessment evaluation tapes and independently completed a second Karnofsky Performance Status Scale rating. Interrater reliability regarding this measure was found to be .91.

Measures

Measures of patients' quality of life and psychological distress served as the major dependent variables used to assess the effects of the problem-solving intervention on adjustment. We made an attempt to increase the construct validity of the assessment protocol by including measures that represented three different sources of information: clinician ratings, patient self-reports, and ratings by an SO. Therefore, in addition to the HRSD and Omega ratings obtained from the semistructured clinical interview, we included three self-report measures in this investigation (Profile of Mood States [POMS]; McNair, Lorr, & Droppleman, 1992; Cancer Rehabilitation Evaluation System, Short Form for Research [CARES]; Schag & Heinrich, 1989; and the BSI), one measure completed by an SO (KAS-R), and one additional measure completed by a physician (Quality-of-Life Index [QL Index]; Spitzer et al., 1981). Last, the Social Problem-Solving Inventory—Revised (SPSI–R; D'Zurilla, Nezu, & Maydeu-Olivares, 2002) served as the measure to address changes in the hypothesized mechanism of action (i.e., PST leads to improvements in problem-solving coping, which leads to improvements in quality of life and psychological well being).

HRSD. The HRSD is a 17-item clinician-rated measure of depressive symptom severity and has been used extensively in clinical research evaluating the effects of various drug and psychosocial treatment approaches. Nine items include 5-point scales ranging from 0 to 4 representing ascending levels of symptom severity, whereas the remaining 8 items include 3-point scales ranging from 0 to 2, also representing ascending levels of severity. A score of 14 or greater was used as one of the inclusion criteria in this study, as that level has been previously used in various outcome studies to indicate a moderate level of clinical depression (A. M. Nezu, Nezu, McClure, & Zwick, 2002). Estimates of interrater reliability have been found to be .84 and higher, whereas its internal consistency has been found to range from .45 to .78 (A. M. Nezu, Ronan, Meadows, & McClure, 2000).

Omega. The Omega was developed to provide a clinician-rated evaluation of a cancer patient's vulnerability to emotional distress along 13 dimensions (e.g., hopelessness, anxiety, powerlessness). Each dimension is rated along a specific 4-point scale on which higher values represent more distress (e.g., 1 = *feels safe and in little danger* to 4 = *panicky; feels overwhelmed*). As a screening device, the Omega was found to be sensitive and specific in identifying high- versus low-distress cancer patients as well as to be sensitive to the effects of a psychosocial intervention geared to reduce distress (Weisman et al., 1980). Because it was originally developed and evaluated on a cancer population, its inclusion in this study was viewed as particularly relevant.

POMS. The POMS is a self-report measure that contains 65 adjectives for which respondents are requested to rate the degree to which that adjective describes the way they have been feeling recently. Ratings range from 0 (*not at all*) to 4 (*extremely*). Most adjectives reflect negative moods (e.g., *sad*, *bushed*), whereas others represent positive moods (e.g., *alert*, *carefree*). In addition to six factor analytically derived scales (Anxiety, Depression, Anger, Vigor, Fatigue, Confusion), a total mood disturbance score can be calculated. This total POMS score was used in this study as a measure of self-reported negative mood and distress. Overall, it has strong psychometric properties regarding reliability and validity, has a long history of use as an outcome measure to detect changes engendered by medical and psychological interventions, and is frequently applied to cancer patients (A. M. Nezu et al., 2000).

CARES. The CARES is a revision of the earlier Cancer Inventory of Problem Situations and was developed by using a competency-based model of coping with cancer as its theoretical underpinnings (Heinrich, Schag, & Ganz, 1984). This cancer-specific self-report measure was designed to assess day-to-day problems and rehabilitation needs of cancer patients (e.g., "difficulty bending or lifting," "frequently feel anxious," "frequently have pain," "difficulty finding a new job since cancer"). Patients rate each problem on a 5-point scale (where 0 = *no problem* and 4 = *severe problem*). The short form for research contains 59 items and can be scored according to a total score and five subscale scores (Physical, Psychosocial, Medical Interaction, Marital, Sexual). These scales were based on item reduction and factor analytic techniques. The CARES measure has been normed on a sample of over 1,100 cancer patients and has been found to possess strong psychometric properties of reliability and validity (Schag, Heinrich, Aadland, & Ganz, 1990). Because it represents a comprehensive list of problems encountered by cancer patients on a daily basis as they cope with the disease and its treatment, the total CARES score was included in this study as one measure of a cancer patient's overall quality of life.

BSI. The BSI is a 53-item self-report measure of psychiatric symptomatology experienced by psychiatric and medical patients. The BSI has been used effectively to assess psychological distress among cancer patients and is rated on a 5-point scale of distress. The BSI can be scored for

nine primary symptom dimensions: Somatization, Obsessive–Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. In addition, three global indices exist: GSI, Positive Symptom Distress Index, and Positive Symptom Total. Test–retest reliability indices have been estimated to range between .80 and .90 across the three global scales. Internal consistency across the nine symptom dimensions ranges between .71 and .85. Strong convergent, discriminant, and predictive validity has been demonstrated for the BSI. The BSI identifies a positive case either by a score of 63 or greater on the GSI or by a score of 63 or greater on any two subscales. Zabora, Smith-Wilson, Fetting, and Enterline (1990) found the BSI to be a particularly valid and useful measure for psychosocial screening among newly diagnosed cancer patients. The GSI of the BSI was used in this study as a measure of overall psychological distress.

KAS-R. The KAS-R was originally designed to be used to obtain observer ratings of patient adjustment after hospitalization. The relative's form contains 127 items, which can be scored according to two major dimensions—Psychiatric Symptoms (e.g., "jittery," "gets angry and breaks things") and Interpersonal or Social Behavior (e.g., "curses at people," "refuses to speak at all for periods of time"). The KAS-R in this study was completed independently by a participant's designated SO. Each item is rated along a 4-point scale on which 1 = *almost never* and 4 = *almost always*. The KAS-R has strong psychometric properties of reliability and validity (Chen & Bryant, 1975) and has been used with a variety of psychiatric and medical patient populations (see Baker, Schmidt, Heinemann, Langley, & Miranti, 1998). It was included in this study to provide for a third source of information: individuals observing the cancer patient in his or her natural environment.

QL Index. The QL Index is a physician-rated measure of the quality of life among patients with cancer and other chronic diseases. It contains five items addressing areas of activity, daily living, health, support, and outlook. Each item is scored as either 0, 1, or 2, with higher scores reflecting a better quality of life. With regard to the area of health, for example, 0 = *has been appearing to feel well or feeling "great" most of the time*, 1 = *has been lacking energy or not feeling entirely "up to par" more than just occasionally*, and 2 = *has been feeling very ill or "lousy"; seeming weak and washed out most of the time or was unconscious*. The QL Index has demonstrated strong reliability and validity properties. In addition, interrater agreement between physician raters has been found to be high (e.g., $\rho = 0.81$). The QL Index was included in this study to provide for another measure of quality of life from a source other than patient self-report and was provided by each participant's attending physician.

SPSI–R. The *SPSI–R* is a 52-item multidimensional measure of social problem-solving ability derived from a factor analysis of the original theory-driven Social Problem-Solving Inventory (D'Zurilla & Nezu, 1990). In addition to a total score, it consists of five scales that measure two constructive dimensions (Positive Problem Orientation, Rational Problem Solving) and three dysfunctional dimensions (Negative Problem Orientation, Impulsivity/Carelessness Style, Avoidance Style). Respondents are asked to rate items (e.g., "I go out of my way to avoid having to deal with problems in my life"; "Before I try to solve a problem, I set a specific goal so that I know exactly what I want to accomplish") on a 5-point Likert-type scale ranging from 0 (*not at all true of me*) to 4 (*extremely true of me*), on which higher scores reflect more effective problem solving. Researchers have found the SPSI–R to have strong internal consistency (alpha range is .79–.95 across the five scales) and test–retest reliability (estimates of .93 and .89 for the total score over a 3-week period among two different samples), as well as strong structural, concurrent, predictive, convergent, and discriminant validity (D'Zurilla et al., 2002). It has also been found to be sensitive to the effects of treatment. Inclusion of the SPSI–R in this study provides for an assessment of changes in the hypothesized mechanism of action, namely problem solving. In other words, the SPSI–R was included to evaluate the hypothesis that increases in problem-solving effectiveness would be associated with both decreases in psychological distress and increases in a patient's quality of life.

Assessment Points

The major assessment points were baseline, posttreatment, and two follow-up evaluation times (6 months and 1 year). To increase compliance with attendance at the two follow-up points, patients completing the study were provided $25 per session for their participation. At all posttreatment and follow-up evaluations, the clinical evaluators remained unaware as to a given participant's assignment to condition.

Procedure

One hundred fifty out of 262 persons who underwent the assessment protocol met the inclusion and exclusion criteria specified previously and were assigned randomly to one of the three conditions described later (n = 50 per condition). Patients not meeting study requirements but desiring therapy were provided with problem-solving treatment because of ethical considerations. However, such individuals were not considered research patients, and no data were obtained from their participation. Of the individuals not meeting criteria, approximately 92% did not meet the distress criteria, whereas the remaining patients were unable to recruit an SO to participate.

Because assignment to condition was staggered over the course of a 4-year period, the following random assignment procedure was used. For the first qualified patient, assignment to condition was made by using a random-numbers table. The second qualified patient was randomly assigned to one of the remaining two conditions, also by using a random-numbers table. The third qualified patient was then entered into the last open condition. This process continued throughout the project such that any given treatment condition selected was not chosen again until the other two were represented once during every three patient assignments.

Treatment Conditions

PST. This treatment program was based on the empirically validated problem-solving training manual originally developed for major depressive disorder (A. M. Nezu, Nezu, & Perri, 1989) and revised specifically for an adult cancer population (see A. M. Nezu, Nezu, Friedman, Faddis, & Houts, 1998, for a detailed PST for cancer treatment manual). The protocol was designed to be provided on an individual basis during 10 1.5-hr weekly sessions. Training in problem orientation was geared toward providing patients with a rational, positive, and constructive set or cognitive appraisal to problems in living and to problem solving as a means of coping with them. The goal during this process was to change those attitudes or beliefs that inhibit or interfere with attempts to engage in the remaining problem-solving tasks. In addition, participants were taught (a) to label emotions as cues as a means of identifying the existence of a problem and (b) to inhibit the tendency to respond automatically to problems and instead engage in the problem-solving process.

Training in the four rational problem-solving tasks involved teaching patients to (a) better define and formulate the nature of problems, (b) generate a wide range of alternative solutions, (c) systematically evaluate the potential consequences of a solution and select the most optimal ones to implement, and (d) monitor and evaluate the actual solution outcome after its implementation (see the Appendix for a list of training activities). Session 1 involved a general introduction to the program, Sessions 2 and 3 were devoted specifically to the problem-orientation component, and Sessions 4–6 involved didactics and practice in the four rational problem-solving skills. The last four sessions provided for an applied integration of the model, as well as for continued practice in the various problem-solving components. Emphasis on the problem-orientation component continued throughout treatment. In addition, between-sessions homework assign-

ments, relevant to each step (e.g., to generate alternative solutions to a personally relevant problem), were included as part of the therapy regimen (see A. M. Nezu et al., 1998, for examples of homework assignments). In an attempt to facilitate maximal therapeutic gain for each patient, as well as to encourage attendance, therapists were directed to ensure that the treatment protocol be made relevant to the specific life circumstances of each individual and not simply to teach skills on a "hypothetical or conceptual level." Last, each patient was provided with written materials reflecting all aspects of PST to use as their own self-help problem-solving manual. In particular, patients were encouraged to refer to this material between sessions and especially postintervention. Participants in the PST condition continued to receive standard medical care for their cancer treatment.

PST–SO. This protocol was implemented identically to that of the PST condition except that a designated SO was included in the training. This SO served as a problem-solving coach by providing social support, encouragement, and feedback regarding the patient's attempts to resolve problems and cope with cancer-related stressors. SOs participated in all phases of the intervention and were provided their own set of handouts and training materials. Whereas they were encouraged to use the problem-solving principles to help cope with their own problems when necessary, the primary purpose of their involvement centered around the cancer patient. This condition was included to empirically assess whether including a structured social support component in therapy would enhance the effects of PST. Significant clinical experience providing PST training to family members of cancer patients to foster their own coping skills as a means of minimizing potential burnout and caregiver stress (e.g., Bucher, Houts, Nezu, & Nezu, 1999; Houts et al., 1996) suggests the strong possibility of enhanced effects if PST is provided to a patient–significant other team. Similar to the PST condition, patients participating in this condition continued to receive standard medical care related to their cancer treatment.

WLC. Participants in this condition were told that Project Genesis, because of limited capacity, was unable to accommodate everyone, but that at the end of a 10- to 12-week period, they would be able to receive treatment. As such, during this waiting period, they were provided with the expectation of receiving PST treatment. To address various ethical concerns because of the moderately high level of psychological distress that was required as an inclusion criterion, each WLC member was contacted twice during this period to assess the need for crisis management or a referral outside of the protocol. No direct counseling was provided during these phone calls; rather, the aim was to provide minimal support and encouragement.

Therapists

Eighteen therapists provided treatment in this study, including 15 advanced psychology graduate students and 3 social workers. All had at least a master's degree in their field and 2 years' experience providing psychotherapy to medical patients. All therapists underwent 15 hr of training in both manual-driven PST protocols that included observing videotapes of Arthur M. Nezu and Christine Maguth Nezu providing PST to cancer patients and extensive didactics, readings, and supervised role-play sessions. Each therapist was assigned at least 1 patient in each condition, and participation ranged from a caseload of 2 patients to 20 patients. Both Arthur M. Nezu and Christine Maguth Nezu provided weekly supervision to each therapist to foster adherence to the therapy manuals, as well as to aid with difficult clinical issues that arose.

Results

Participant Sample

Treatment completers. Participants in both conditions receiving PST were strongly encouraged to attend all 10 sessions. Because of medical appointments and other difficulties in attending sessions on a consistent weekly basis, attempts were made to be flexible in scheduling to ensure completion of all therapy and assessment sessions. This led to situations at times in which two treatment sessions were scheduled within 1 week to compensate for a missed session as well as to times when patients were seen on a biweekly schedule for a brief period. To be considered a treatment completer, a person was required to attend 8 of the 10 sessions. Participants in the PST condition completed an average of 9.7 sessions in approximately 12.8 weeks, whereas patients in the PST–SO condition completed an average of 9.6 sessions in 13.1 weeks. These differences were not significant.

Attrition. Of the 150 patients originally enrolled in this study, 132 completed the protocol and provided baseline and posttreatment data. Of the PST group, 1 patient died, 1 moved to another geographical location, and 3 dropped out of treatment before completing the 10 sessions. In the PST–SO condition, 2 patients passed away, 2 individuals moved, 2 dropped out of treatment, and the significant other of another patient refused to continue midway through treatment. In the WLC condition, 1 patient died, 2 patients become medically ill and unable to complete the posttreatment assessment, and 3 patients moved. No member of the WLC requested or was assessed to require a therapy referral during the telephone contacts. Statistical comparisons between these 18 individuals and the remaining 132 patients revealed no differences regarding any of the measures or demographic parameters.[1]

Pretreatment Differences

Table 1 contains summary data (i.e., means, frequencies) for these 132 participants by treatment condition regarding age, gender, cancer diagnosis, baseline Karnofsky Performance Status Scale scores, marital status, employment status, race, years of education, and total family income. Of the 132 patients, approximately 28% had a Stage I diagnosis, 56% had a Stage II diagnosis, and the remaining individuals had a Stage III diagnosis (exclusion criteria precluded a Stage IV diagnosis). No differences regarding disease staging were identified among the three conditions. Nor were any differences among conditions noted regarding medical treatment procedures used (i.e., surgery, chemotherapy, radiation, bone marrow transplantation). Although somewhat subjective, the crucial criterion regarding medical status was a physician's judgment that a given patient had a 50% or greater chance for a 5-year survival, which is a common benchmark used in oncology practice.

With regard to the SOs participating in this study, 95% were spouses, with the remainder being primarily adult sons or daughters. In one case, the SO was a close friend. No differences were identified across the three conditions regarding this distribution.

Initial multivariate analysis of covariance (in which hospital site served as the covariate) and chi-square tests revealed an overall lack of significant differences among the three conditions regard-

[1] We also conducted analyses using an intent-to-treat perspective on all 150 participants who began treatment by using their pretreatment scores as their posttreatment scores (i.e., assuming no change). Results of this set of analyses were no different than the results including only those who completed the posttreatment assessment protocol. As such, the results reported in this article reflect this latter set of data.

Table 1
Demographic Information for Participants by Condition

Variable	PST	PST–SO	WLC
n	45	43	44
Age (years)	49.18	45.81	46.65
Gender (% female)	67	64	70
Cancer diagnosis (%)			
Leukemia	22	26	20
Lung	2	10	0
Breast	40	48	45
Colon	7	0	5
Ovarian	7	5	5
Non-Hodgkin's	4	0	5
Prostate	7	5	8
Head/neck	7	0	3
Other	4	6	9
Baseline Karnofsky Ratings			
M (*SD*)	83.13 (9.03)	82.54 (11.66)	83.50 (9.31)
Marital status (%)			
Married	60	64	60
Divorced/separated	20	21	20
Single	20	15	20
Employment status (%)			
Employed	76	71	70
Retired	11	10	10
Unemployed	13	19	20
Race (%)			
White	76	81	75
Black	18	15	18
Asian	4	2	3
Hispanic	2	2	3
Years of education	14.89	14.02	14.8
Total family income (in $1,000s)	36.96	35.88	37.02

Note. PST = problem-solving therapy; PST–SO = problem-solving therapy including patient's significant other; WLC = waiting list control; Karnofsky = Karnofsky Performance Status Scale.

ing these demographic variables, with the exception of differences in the percentages of certain cancer locations across the three conditions (i.e., lung, colon, non-Hodgkins, and head and neck). In addition, a series of one-way analyses of covariance, performed individually on each dependent variable, revealed no significant differences at baseline among the three conditions regarding any of these pretreatment measures. Moreover, hospital site was found to be a nonsignificant covariate, and therefore, led to our combining data sets. Tables 2, 3, and 4 contain the means and standard deviations by condition and assessment point for the clinician ratings, self-report measures, and ratings by the SO, respectively. Parenthetically, despite a positive prognosis (i.e., a 5-year survival rate of 50% or greater was an inclusion criterion), these patients were found to be experiencing levels of distress at clinically significant levels when compared with normative samples (e.g., $M > 20$ on the HRSD).

Baseline to Posttreatment

Overall statistical plan. To determine the differential effects of treatment from baseline to posttreatment, given the lack of pretreatment differences, our overall initial statistical strategy involved a series of 3 (treatment condition) × 2 (baseline vs. posttreatment) repeated measures multivariate analyses of variance (MANOVAs). Specifically, three separate omnibus MANOVAs were conducted on the basis of the source of data— one included the three clinician ratings (i.e., Omega, QL Index, HRSD), one encompassed the four self-report measures (i.e., POMS, BSI, CARES, SPSI-R), and one included the two KAS-R measures that were completed by an SO. If the omnibus MANOVA *F* (Wilks's Lambda) was found to be significant for the overall Time × Condition interaction regarding the analysis for a given set of measures, then individual Time × Condition *F* tests (using the mean-squares values resulting from the MANOVA solution for

Table 2
Means (and Standard Deviations) for Clinician Ratings by Treatment Condition and Assessment Period

Variable	PST	PST–SO	WLC
Omega			
Baseline	25.20 (4.19)$_{A, a}$	25.63 (4.30)$_{A, a}$	25.39 (4.51)$_{A, a}$
Posttreatment	14.89 (3.81)$_{A, b}$	15.83 (2.89)$_{A, b}$	24.29 (5.33)$_{B, a}$
6-month follow-up	16.88 (5.31)$_{A, b}$	15.11 (3.93)$_{A, b}$	
1-year follow-up	16.95 (6.01)$_{A, b}$	14.99 (4.27)$_{A, b}$	
QL Index			
Baseline	8.09 (2.25)$_{A, a}$	8.69 (1.13)$_{A, a}$	7.89 (1.81)$_{A, a}$
Posttreatment	8.31 (1.69)$_{A, a}$	8.60 (1.03)$_{A, a}$	8.25 (1.79)$_{A, a}$
6-month follow-up	8.59 (2.11)$_{A, a}$	8.92 (1.23)$_{A, a}$	
1-year follow-up	8.70 (1.99)$_{A, a}$	8.43 (1.80)$_{A, a}$	
HRSD			
Baseline	20.40 (4.21)$_{A, a}$	21.28 (3.66)$_{A, a}$	21.23 (3.33)$_{A, b}$
Posttreatment	6.37 (3.77)$_{A, b}$	5.99 (2.67)$_{A, b}$	22.13 (4.51)$_{B, a}$
6-month follow-up	6.63 (4.42)$_{A, b}$	6.47 (2.84)$_{A, b}$	
1-year follow-up	7.05 (4.22)$_{A, b}$	6.22 (3.01)$_{A, b}$	

Note. Differential capital letter subscripts represent statistically significant differences between means for a given measure across treatment conditions within the same assessment period. Differential lowercase letter subscripts represent statistically significant differences between means for a given measure across assessment periods within a given treatment condition. PST = problem-solving therapy; PST–SO = problem-solving therapy including patient's significant other; WLC = waiting list control; Omega = Omega Vulnerability Rating Scale; QL Index = Quality-of-Life Index; HRSD = Hamilton Rating Scale for Depression.

Table 3
Means (and Standard Deviations) for Patient Self-Report Measures by Treatment Condition and Assessment Period

Variable	PST	PST–SO	WLC
POMS			
Baseline	73.00 (21.26)$_{A, a}$	70.38 (23.71)$_{A, a}$	75.68 (25.72)$_{A, a}$
Posttreatment	33.27 (21.61)$_{A, b}$	37.00 (20.95)$_{A, b}$	83.33 (24.53)$_{B, a}$
6-month follow-up	35.53 (27.82)$_{A, b}$	25.51 (26.21)$_{B, c}$	
1-year follow-up	37.02 (25.64)$_{A, b}$	24.99 (28.17)$_{B, c}$	
Brief Symptom Inventory (GSI)			
Baseline	1.33 (0.35)$_{A, a}$	1.33 (0.38)$_{A, a}$	1.37 (0.31)$_{A, a}$
Posttreatment	0.37 (0.29)$_{A, b}$	0.29 (0.19)$_{A, b}$	1.46 (0.32)$_{B, a}$
6-month follow-up	0.36 (0.30)$_{A, b}$	0.15 (0.23)$_{B, c}$	
1-year follow-up	0.39 (0.29)$_{A, b}$	0.19 (0.17)$_{B, c}$	
CARES			
Baseline	2.37 (0.44)$_{A, a}$	2.38 (0.42)$_{A, a}$	2.39 (0.43)$_{A, a}$
Posttreatment	0.78 (0.31)$_{A, b}$	0.69 (0.39)$_{A, b}$	2.43 (0.33)$_{B, a}$
6-month follow-up	0.81 (0.38)$_{A, b}$	0.48 (0.38)$_{A, b}$	
1-year follow-up	0.84 (0.39)$_{A, b}$	0.57 (0.41)$_{A, b}$	
Total SPSI–R			
Baseline	8.73 (1.87)$_{A, a}$	8.43 (1.67)$_{A, a}$	8.99 (1.93)$_{A, a}$
Posttreatment	15.19 (1.80)$_{A, b}$	15.33 (1.53)$_{A, b}$	8.52 (1.23)$_{B, a}$
6-month follow-up	14.17 (1.30)$_{A, b}$	13.85 (1.79)$_{A, b}$	
1-year follow-up	12.94 (1.65)$_{A, b}$	13.95 (1.89)$_{A, b}$	

Note. Differential capital letter subscripts represent statistically significant differences between means for a given measure across treatment conditions within the same assessment period. Differential lowercase letter subscripts represent statistically significant differences between means for a given measure across assessment periods within a given treatment condition. PST = problem-solving therapy; PST–SO = problem-solving therapy including patient's significant other; WLC = waiting list control; POMS = Profile of Mood States; GSI = Global Severity Index; CARES = Cancer Rehabilitation Evaluation System; SPSI–R = Social Problem-Solving Inventory—Revised.

each of the measures composing that group) were conducted next. Last, individual contrasts (*F* tests) were conducted to determine differences among means across conditions at each assessment, as well as between pretreatment and posttreatment scores for each condition.

Summary of results. As can be observed in Table 5, which contains the *F* values for all measures noted above by time, condition, and their interaction, the three omnibus *F* values (Wilks's Lambda) representing the three groups of variables were found to be significant at the .001 level for the main effects of both time and condition as well as their interaction. With the exception of the QL Index, for which no significant differences were observed as a function of either main effect or interaction, similar findings were observed for the remaining measures.

Focusing on the individual contrasts (*F* tests using a MANOVA solution), the following consistent picture emerged regarding ef-

Table 4
Means (and Standard Deviations) for Significant Other Ratings (Katz Adjustment Scale, Relative's Form; KAS-R) by Treatment Condition and Assessment Period

Variable	PST	PST–SO	WLC
KAS-R, Psychiatric Symptoms			
Baseline	131.24 (26.27)$_{A, a}$	126.19 (21.51)$_{A, a}$	128.03 (20.32)$_{A, a}$
Posttreatment	103.67 (19.79)$_{A, b}$	101.28 (17.47)$_{A, b}$	130.00 (21.59)$_{B, a}$
6-month follow-up	105.22 (18.77)$_{A, b}$	79.93 (18.02)$_{B, c}$	
1-year follow-up	100.74 (19.99)$_{A, b}$	81.33 (19.02)$_{B, c}$	
KAS-R, Interpersonal or Social Behavior			
Baseline	65.29 (8.06)$_{A, a}$	63.72 (13.08)$_{A, a}$	61.93 (9.73)$_{A, a}$
Posttreatment	50.36 (10.98)$_{A, b}$	51.93 (8.95)$_{A, b}$	64.55 (11.93)$_{B, a}$
6-month follow-up	49.79 (9.86)$_{A, b}$	50.38 (9.01)$_{A, b}$	
1-year follow-up	52.65 (10.11)$_{A, b}$	49.21 (11.72)$_{A, b}$	

Note. Differential capital letter subscripts represent statistically significant differences between means for a given measure across treatment conditions within the same assessment period. Differential lowercase letter subscripts represent statistically significant differences between means for a given measure across assessment periods within a given treatment condition. PST = problem-solving therapy; PST–SO = problem-solving therapy including patient's significant other; WLC = waiting list control.

Table 5
Wilks's Lambda F Values for Repeated Measures MANOVAs for Effects Due to Time (Baseline to Posttreatment), Experimental Condition, and Time × Treatment Interactions for All Measures

Measure	Time *F* (*df*s)	Condition *F* (*df*s)	Time × Condition *F* (*df*s)
Clinician ratings	308.50 (3, 127)**	33.89 (6, 254)**	53.09 (6, 254)**
Omega	276.35 (1, 127)**	22.68 (2, 129)**	50.32 (2, 129)**
QL Index	1.54 (1, 127)	1.92 (2, 129)	1.03 (2, 129)
HRSD	682.44 (1, 129)**	131.53 (2, 129)**	206.09 (2, 129)**
Self-report measures	205.09 (4, 126)**	41.42 (8, 252)**	41.57 (8, 252)**
Brief Symptom Inventory (GSI)	361.81 (1, 123)**	74.06 (2, 123)**	117.91 (2, 123)**
POMS	174.75 (1, 123)**	44.00 (2, 123)**	65.47 (2, 123)**
CARES	210.19 (1, 123)**	124.69 (2, 123)**	298.06 (2, 123)**
SPSI–R	638.74 (1, 129)**	165.07 (2, 129)**	197.41 (2, 129)**
KAS-R, ratings by others	44.89 (2, 128)**	5.73 (4, 256)**	14.51 (4, 256)**
Psychiatric Symptoms	63.13 (1, 129)**	10.93 (2, 129)**	19.88 (2, 129)**
Interpersonal or Social Behavior	67.53 (1, 129)**	5.36 (2, 129)*	26.01 (2, 129)**

Note. MANOVAs = multivariate analyses of variance; Omega = Omega Vulnerability Scale; QL Index = Quality-of-Life Index; HRSD = Hamilton Rating Scale for Depression; GSI = Global Severity Index; CARES = Cancer Rehabilitation Evaluation System; POMS = Profile of Mood States; SPSI–R = Social Problem-Solving Inventory—Revised; KAS-R = Katz Adjustment Scale, Relative's Form.
* $p < .01$. ** $p < .001$.

fects due to condition over time: Patients in both treatment conditions were found to improve significantly as compared with their counterparts in the WLC control condition. Specifically, adult cancer patients in both treatment conditions were found to have improved overall quality of life and decreased global psychological distress, as measured by a clinician rating (Omega; see Table 2), several self-report inventories (BSI, POMS, CARES; see Table 3), and ratings by a significant other (both KAS-R indices; see Table 4). In addition, participants in both conditions were found to report significantly lower levels of depressive symptoms compared with WLC members as measured by the HRSD (see Table 2), as well as significantly more effective problem-solving ability as measured by the SPSI–R (see Table 3). No differences were noted, whether over time or as a function of treatment condition, regarding the QL Index. Further, patients in the WLC condition did not experience any significant changes on any measure from baseline to posttreatment. Last, no differences for any variable emerged at posttreatment between the two treatment conditions (PST vs. PST–SO).

Effect sizes. Calculation of the standardized difference between group means (i.e., baseline group mean of treatment condition subtracted from the same group mean of the control group divided by the pooled standard deviation of these two groups) was conducted next to provide for meaningful comparisons with other investigations. These yielded rather large effect size estimates. Specifically, for the Omega, HRSD, Total POMS, BSI, CARES, KAS-R Symptoms, and KAS-R Interpersonal Behavior measures, effect size estimates were found to be 2.06, 3.81, 2.17, 3.52, 5.16, 1.27, and 1.24, respectively, in the PST condition and 2.06, 4.49, 2.04, 4.5, 4.83, 1.47, and 1.21, respectively, in the PST–SO condition.

Clinical significance. Assessment of the clinical meaningfulness of these treatment effects was conducted next. The criterion, following Jacobson, Follette, and Revenstorf's (1984) recommendation for experiencing "clinically significant" change, was a cutoff point of a posttreatment score of 2 standard deviations beyond the mean of a "dysfunctional population" (i.e., the WLC condition). Following this approach, on the Omega measure, for example, 62% of the PST, 57% of the PST–SO, and 0% of the WLC conditions experienced clinically significant improvement in clinician-rated overall quality-of-life scores. On the HRSD, POMS, BSI, and CARES measures, the rates of improvement were as follows: 91%, 67%, 89%, and 92%, for patients in the PST condition, respectively; 90%, 59%, 85%, and 90%, for individuals in the PST–SO condition, respectively; and 0% concerning all these measures for participants in the WLC conditions. These differences in the proportion of participants characterized by clinically meaningful change were found to be significant through a series of chi-square analyses.

Mechanism of action. As noted previously, statistical analyses indicated that cancer patients in both treatment conditions improved significantly in their self-reported problem-solving scores as compared with their counterparts in the WLC condition, but no differences between these two interventions were identified (see Table 3). To test the assumption that improvements on the various dependent measures occurring between baseline and posttreatment were related to the positive effects of PST, we calculated difference scores. Results of zero-order correlations show increases in SPSI–R scores (i.e., improvements in problem-solving ability) were significantly associated with decreases in overall general distress, as measured by both the POMS ($r = -.69$) and the BSI ($r = -.66$), as well as in depressive symptomatology, as measured by the HRSD ($r = -.59$). In addition, improvements in problem solving were significantly correlated with enhanced quality of life as measured by the Omega ($r = -.59$) and the CARES ($r = -.51$). All such correlations were statistically significant at the .01 level.

Treatment Adherence

All treatment sessions were audiotaped with written permission of the participants to assess the degree to which the treatment

providers adhered to the intervention manuals. Six advanced clinical psychology doctoral students, previously trained in PST but *not* participating in this investigation as therapists, received 8 hr of training in making adherence ratings. These raters followed a specific protocol previously designed alongside the treatment manual that delineated specific therapist behaviors for both interventions for each treatment session.

Approximately 15% of all tapes were randomly selected, blocking by therapist, treatment condition, and treatment session, to review for treatment adherence. Interrater reliability of these ratings across these tapes was found to be approximately 94% (overall percentage agreement). Adherence ratings ranged between 82%–100% across the reviewed tapes, with subsequent analyses revealing a lack of differences as a function of therapist, treatment condition, or treatment session. This analysis suggests that the treatments under investigation (i.e., PST and PST–SO) were, in fact, implemented validly according to their respective manuals.

Patient Evaluations of Treatment Rationale and Therapist Credibility

At the conclusion of both the 1st and 10th sessions, we requested that participants in both treatment conditions anonymously complete a questionnaire concerning their reactions to the treatment rationale and therapist as well as their beliefs about being helped. Specifically, they were asked to rate, using a 5-point Likert-type scale ranging from 1 (*completely disagree*) to 5 (*completely agree*), their level of agreement with the following four items: (a) "I believe that Project Genesis will help (has helped) me to become less distressed and deal better with my cancer"; (b) "I believe that my counselor is (was) competent and can be (has been) effective in helping me to cope better with my problems"; (c) "I agree with the ideas that this program is based upon"; and (d) "Based upon the first session (entire program), I believe that I will be (have been) helped to become less distressed." Various analyses revealed no significant differences concerning any of these ratings as a function of varying treatment conditions, therapists, or evaluation points. Although such ratings can be subject to social desirability factors, these results do provide support for the hypothesis that differences (or lack of) among conditions and counselors were not attributable to differences related to participants' expectations, satisfaction, or perceptions of the overall program or therapist.

Six-Month Follow-Up Analyses

Because of ethical considerations, all members of the WLC condition were provided with treatment (the patient's choice of either PST or PST–SO) after the posttreatment assessment point. Therefore, follow-up analyses included only those participants in the two treatment conditions. In the PST condition, 42 of the 45 participants providing posttreatment data underwent the 6-month evaluation, whereas 39 of the pool of 43 patients in the PST–SO condition provided data for this follow-up assessment point. All analyses conducted on these follow-up data involved 2 (condition) $\times$ 2 (trial: posttreatment vs. 6-month follow-up) repeated-measures MANOVAs that used the same groupings as in the pre–posttreatment analyses. In general, the basic results from these analyses indicate the lack of remission regarding any of the measured indices. In other words, with the exception of certain continued improvements, the positive effects of the two intervention protocols, in general, were maintained 6 months after treatment ended. Further, results from individual contrasts indicated that patients receiving PST along with another individual reported significantly lower overall levels of distress at the 6-month follow-up as assessed by three indices: POMS, BSI, and KAS-R, Symptoms measures. Specifically, PST–SO patients reported further decreases in distress symptoms for these three measures, whereas PST individuals remained the same as at their posttreatment levels. However, differences regarding the remaining measures (Omega, HRSD, CARES, SPSI–R, and KAS-R, Interpersonal Behavior) were lacking. Last, no differences emerged for the QL Index, either between conditions or as a function of time.

One-Year Follow-Up Evaluation

With the exception of 1 patient in each condition, all participants providing 6-month follow-up data provided data at 1-year posttreatment. In general, results of the statistical analyses revealed that no significant differences (either deterioration or improvement) occurred between the 6-month and 12-month posttreatment follow-up evaluation points. In general, this suggests that the positive effects of the original PST intervention were basically maintained 1 year following treatment and that the enhanced effects (at least on some measures) due to including an SO in treatment (i.e., the PST–SO condition) that were observed at the 6-month follow-up were also sustained 6 months later.

Discussion

In keeping with a multitude of previous studies (see A. M. Nezu et al., 2003), the patient sample in this investigation, despite medically positive prognoses, were initially found to experience clinically significant levels of psychological distress. However, the overall results of this investigation support the efficacy of PST as a means to decrease such distress and improve the quality of life of these cancer patients. Such findings cut across a variety of clinician-rated, self-report, and SO measures as analyzed by means of conventional inferential statistical analyses, effect size estimates, and an analysis of the clinical significance of the results. As such, the present findings have several implications.

First, PST appears to be an effective psychosocial intervention for the treatment of significant psychological distress among adult cancer patients. As such, it adds to the general literature base underscoring the efficacy of PST for a variety of psychological disorders, particularly depression (A. M. Nezu, in press). In this study, for example, PST was found to significantly affect clinician-rated symptoms of depression. Further, it adds conceptual support to the importance of problem-solving coping as a moderator of the relationship between stressful life events (e.g., cancer) and psychological distress (A. M. Nezu et al., 1999). It should be noted that the effect sizes identified in the present study are substantially larger than the mean effect sizes noted earlier that came from the meta-analysis conducted by Meyer and Mark (1995), suggesting that PST appears to be a particularly robust intervention. In addition, as Andersen (2002) recently noted, treatment effects from other studies have tended to be transitory, with intervention and control conditions equivalent at follow-up. In contrast, in the

present study, the positive effects of PST in both experimental conditions were found to be maintained at 6-months and 1-year posttreatment, suggesting that PST, by enhancing coping skills, does in fact provide for a conceptually sound treatment approach to fostering generalization over time. Moreover, participants in the PST–SO condition actually experienced *continued* improvement after the treatment ended.

Second, although not conclusive, it would appear by virtue of the resulting significant correlations between improvements in problem solving and decreases in distress symptoms that problem solving was the major mechanism of action responsible for the positive treatment effects. Although one can argue that the sole measure of problem solving in this study involved a self-report measure and, therefore, might be limited, other research has found self-report measures of problem solving to correlate highly with behavioral performance measures of problem solving (e.g., A. M. Nezu & Ronan, 1988). Inclusion of a measure representing the hypothesized mechanism of action (i.e., problem solving) and subsequently analyzing the relationship between improvements in this variable and improvements in various outcomes, therefore, are viewed as important features that were previously lacking in many of the studies assessing psychosocial interventions for cancer patients (e.g., Andersen, 1992, 2002).

A third implication involves the potential importance of including an SO in treatment. Although no differences were identified at the end of treatment related to the inclusion of such a person, at the 6-month follow-up assessment differences did emerge. Specifically, patients receiving PST along with their SO reported significantly more improvement at 6 months posttreatment on measures of emotional distress and symptomatology. These results are consistent with other investigations that found spouse involvement to be an effective intervention strategy, including, for example, the treatment of osteoarthritic knee pain (Keefe et al., 1999), cigarette smoking (Murray, Johnston, Dolce, Lee, & O'Hara, 1995), depression (Beach, Sandeen, & O'Leary, 1987), and alcoholism (McCrady et al., 1986). Conceptually, inclusion of a spouse (or SO) can be important for several reasons. First, it can promote transfer of learning into a patient's natural environment; that is, the spouse can serve as a coach to help the patient remember when to use the problem-solving skills as well as to provide him or her with useful feedback. Second, it provides a mechanism by which the dyad can engage in problem solving regarding difficulties they may have as a couple. Improvement in such relationships (and the family as a whole where relevant) can further positively affect the cancer patient's quality of life. Third, cancer and its treatment can have a profound impact on the patient's spouse and family. Including the SO treatment allows for a forum to work on such problems and enhance his or her coping ability to deal with such stress, which can indirectly affect the patient's well-being.

Despite the enhanced effect of the PST–SO condition, as compared with PST by the patient alone, the added value of this approach was evident regarding only three of the included measures—the POMS, BSI, and KAS-R, Symptoms. How should these findings be interpreted? It would appear, on measures of subjective well-being, that including an SO is quite important. However, inclusion of this additional person did not appear to affect clinician ratings of depression (i.e., HRSD), problem-solving ability (SPSI–R), cancer-related problems (i.e., CARES), or collateral ratings of interpersonal behavior (i.e., KAS-R, Interpersonal). Although the possibility exists that this lack of impact on certain measures may simply reflect a ceiling effect, the real value of the PST–SO condition remains to be evaluated in future research. It is plausible that the true impact of such an approach tends to focus on subjective well-being, whereas outward behaviors, such as those assessed by other individuals (e.g., a trained evaluator in the case of the HRSD or the spouse in the case of the KAS-R, Interpersonal measure), are unaffected.

The lack of any between-subjects and within-subject differences related to the physician ratings (i.e., the QL Index) is perplexing. It is possible that this measure is not sensitive to changes engendered by psychosocial treatment protocols. On the other hand, it is also possible that the physicians who completed this measure did not have the ability to accurately assess such changes because of infrequent observations. Collectively, these differences in the pattern in results among all included measures underscore the importance of including a multitrait, multimethod assessment protocol when evaluating the effects of any psychosocial intervention. In other words, if only one or two measures were included to serve as dependent variables in this study, differences among the treatment conditions may not have been detected.

When interpreting the findings of the present investigation, several limitations should be noted. First, because an alternative treatment or nonspecific therapist contact condition was not included in the present study design, one cannot state conclusively that the positive treatment effects observed were due to the problem-solving training itself or to continued therapist contact. However, previous research evaluating the efficacy of PST that included such an attention placebo comparison control condition provides some evidence to controvert this concern. For example, A. M. Nezu (1986a), in evaluating the effects of PST for adults diagnosed with major depressive disorder, did include such a control condition (i.e., group therapy), one that was rated by participants as equally plausible and therapeutic as the group PST condition. Whereas this alternative treatment condition was found to be efficacious in reducing depression as compared with a WLC, it was *less* effective than the PST condition, suggesting that the positive treatment effects of PST were not simply due to general therapist attention and care. Moreover, results from the analyses in the present investigation indicating that improvements in the hypothesized mechanism of action (i.e., problem solving) were, in fact, associated with improvements in quality of life and psychological well-being further minimize the negative impact that the omission of such a control condition has on internal validity.

A second limitation was engendered by the balance between methodological and ethical concerns. More specifically, as stated previously, because certain inclusion criteria in this study required moderately high levels of psychological distress, it was decided that because of ethical reasons, participants assigned to the WLC would be provided treatment at the end of 10–12 weeks, thus prohibiting the ability to assess the long-term effects of PST from a between-subjects perspective. In other words, we are unable to definitively conclude that the maintenance of treatment effects was specific to PST given the lack of a comparison between treated versus untreated patients at the two follow-up points. However, we note that there was no deterioration in problem solving after the treatment program ended, simultaneous with observing that the positive effects of PST were maintained, which does provide some

evidence that the positive long-term effects were engendered by the PST and not simply by the passage of time.

A third limitation involves the nature of the patient sample included in this study. To participate in this investigation, individuals had to identify an SO who was willing to be involved in treatment. As such, the results of this study may not be generalizable beyond such a sample in that the lack of an SO in one's life (or one who is willing to be involved in an intensive research project) might add more stress to the cancer patient's experience and, thus, may lead to differential responses to the PST protocol applied in this study. In addition, the patients, by virtue of the inclusion criteria, were required to have significant psychological distress despite a rather positive prognosis regarding the course of their cancer. As such, the present study is unable to determine whether PST would be an efficacious approach for cancer patients with much less positive prognoses.

Although it was not a goal of the present investigation, another limitation involves the lack of data regarding actual health outcome (e.g., the impact of PST on morbidity and mortality rates, psychoneuroimmunologic parameters) as well as other biobehavioral outcomes. For example, as Andersen's (2001, 2002) biobehavioral model hypothesizes, multiple paths involving both psychosocial and biological factors can interact to influence the overall course of the cancer disease. Psychosocial variables include both compliance behaviors (i.e., adherence to medical treatment) and other health behaviors (i.e., diet, exercise, tobacco use). The impact of cancer-related stress on various systems (i.e., autonomic, endocrine, immune) can also have an adverse effect on overall health outcome. Given that the present investigation only addressed one component of this overall model, future research concerning the effects of PST on cancer patients needs to include additional aspects of such a model to be able to provide a more comprehensive understanding of how improved problem-solving coping affects a multitude of cancer-related outcome variables.

In sum, the present investigation adds to the overall literature, providing strong support for the efficacy of psychosocial interventions for cancer patients, in this instance, problem-solving therapy. Moreover, in contrast to many other interventions, the effects of PST were found to be fairly robust and long lasting. Inclusion of a measure to assess the specificity of the effects associated with the hypothesized mechanism of action (i.e., improved problem-solving coping) provides for a methodologically more confident stance concerning these findings. However, future research especially needs to evaluate the impact of PST on a patient's medical status (e.g., mortality and morbidity) and other health behaviors, as well as to identify means by which such efficacious approaches can be translated meaningfully into programs that reach larger numbers of cancer patients, especially, for example, those individuals who do not live near major medical centers (see Allen et al., 2002).

References

Allen, S. M., Shah, A. C., Nezu, A. M., Nezu, C. M., Ciambrone, D., Hogan, J., & Mor, V. (2002). A problem-solving approach to stress reduction among younger women with breast carcinoma: A randomized controlled trial. *Cancer, 94,* 3089–3100.

Andersen, B. L. (1992). Psychological interventions for cancer patients to enhance the quality of life. *Journal of Consulting and Clinical Psychology, 60,* 552–568.

Andersen, B. L. (2001). A biobehavioral model of psychological interventions. In A. Baum & B. L. Andersen (Eds.), *Psychosocial interventions for cancer*. Washington, DC: American Psychological Association.

Andersen, B. L. (2002). Biobehavioral outcomes following psychological interventions for cancer patients. *Journal of Consulting and Clinical Psychology, 70,* 590–610.

Arean, P. A., Perri, M. G., Nezu, A. M., Schein, R. L., Christopher, F., & Joseph, T. X. (1993). Comparative effectiveness of social problem-solving therapy and reminiscence therapy as treatments for depression in older adults. *Journal of Consulting and Clinical Psychology, 61,* 1003–1010.

Baker, K. A., Schmidt, M. F., Heinemann, A. W., Langley, M., & Miranti, S. V. (1998). The validity of the Katz Adjustment Scale among people with traumatic brain injury. *Rehabilitation Psychology, 43,* 30–40.

Baum, A., & Andersen, B. L. (Eds.). (2001). *Psychosocial interventions for cancer*. Washington, DC: American Psychological Association.

Beach, S. R. H., Sandeen, E. E., & O'Leary, K. D. (1987, November). *Treatment for the depressed, maritally discordant client: A comparison of behavioral marital therapy, individual cognitive therapy, and wait list*. Paper presented at the annual meeting of the Association for Advancement of Behavior Therapy, Boston.

Brack, G., LaClave, L., & Wyatt, A. S. (1992). The relationship of problem solving and reframing to stress and depression in female college students. *Journal of College Student Development, 33,* 124–131.

Bucher, J. A., Houts, P. S., Nezu, C. M., & Nezu, A. M. (1999). Improving problem-solving skills of family caregivers through group education. *Journal of Psychosocial Oncology, 16,* 73–84.

Chen, M. K., & Bryant, B. E. (1975). The measurement of health—A critical and selective overview. *International Journal of Epidemiology, 4,* 257–264.

Cheng, S. K. (2001). Life stress, problem solving, perfectionism, and depressive symptoms in Chinese. *Cognitive Therapy and Research, 25,* 303–310.

Derogatis, L. R. (1993). *Brief Symptom Inventory (BSI) administration, scoring, and procedures manual* (3rd ed.). Minneapolis, MN: National Computer Systems.

D'Zurilla, T. J., & Nezu, A. M. (1990). Development and preliminary evaluation of the Social Problem-Solving Inventory (SPSI). *Psychological Assessment, 2,* 156–163.

D'Zurilla, T. J., & Nezu, A. M. (1999). *Problem-solving therapy*: *A social competence approach to clinical intervention* (2nd ed.). New York: Springer.

D'Zurilla, T. J., Nezu, A. M., & Maydeu-Olivares, A. (2002). *Social Problem-Solving Inventory—Revised (SPSI–R)*. North Tonawanda, NY: Multi-Health Systems.

Fawzy, F. I., Fawzy, N. W., Arndt, L. A., & Pasnau, R. O. (1995). Critical review of psychosocial interventions in cancer care. *Archives of General Psychiatry, 52,* 100–113.

Frye, A. A., & Goodman, S. H. (2000). Which social problem-solving components buffer depression in adolescent girls? *Cognitive Therapy and Research, 24,* 637–650.

Goodman, S. H., Gravitt, G. W., & Kaslow, N. J. (1995). Social problem solving: A moderator of the relation between negative life stress and depression symptoms in children. *Journal of Abnormal Child Psychology, 23,* 473–485.

Hamilton, M. (1960). Development of a rating scale for depression. *Journal of Neurology, Neurosurgery and Psychiatry, 23,* 56–62.

Heinrich, R. L., Schag, C. C., & Ganz, P. A. (1984). Living with cancer: The Cancer Inventory of Problem Situations. *Journal of Clinical Psychology, 40,* 972–980.

Houts, P. S., Nezu, A. M., Nezu, C. M., & Bucher, J. A. (1996). A problem-solving model of family caregiving for cancer patients. *Patient Education and Counseling, 27,* 63–73.

Jacobson, N. S., Follette, W. C., & Revenstorf, D. (1984). Psychotherapy

outcome research: Methods for reporting variability and evaluating clinical significance. *Behavior Therapy, 15,* 336–352.

Jacobson, N. S., Holtzworth-Munroe, A., & Schmaling, K. B. (1989). Marital therapy and spouse involvement in the treatment of depression, agoraphobia, and alcoholism. *Journal of Consulting and Clinical Psychology, 57,* 5–10.

Karnofsky, D. A., & Burchenal, J. H. (1949). The clinical evaluation of chemotherapeutic agents in cancer. In C. M. MacLeod (Ed.), *Evaluation of chemotherapeutic agents* (pp. 199–205). New York: Columbia University Press.

Katz, M. M., & Lyerly, S. B. (1963). Methods for measuring adjustment and social behavior in the community: I. Rationale, description, discriminative validity and scale development. *Psychological Reports, 13,* 503–535.

Keefe, F. J., Caldwell, D. S., Baucom, D., Salley, A., Robinson, E., Timmons, K., et al. (1999). Spouse-assisted coping skills training in the management of knee pain in osteoarthritis: Long-term follow-up results. *Arthritis Care & Research, 12,* 101–111.

Manne, S. (2003). Role of coping and social support. In I. B. Weiner (Series Ed.) & A. M. Nezu, C. M. Nezu, & P. A. Geller (Vol. Eds.), *Handbook of psychology: Vol. 9. Health psychology* (pp. 51–74). New York: Wiley.

McCrady, B. S., Noel, N. E., Abrams, D. B., Stout, R. L., Nelson, H. F., & Hay, W. N. (1986). Comparative effectiveness of three types of spouse involvement in outpatient behavioral alcoholism treatment. *Journal of Studies on Alcohol, 47,* 459–467.

McNair, D. M., Lorr, M., & Droppleman, L. F. (1992). *Profile of Mood States*. San Diego, CA: EdITS.

Mermelstein, H. T., & Lesko, L. (1992). Depression in patients with cancer. *Psychooncology, 1,* 199–125.

Meyer, T. J., & Mark, M. M. (1995). Effects of psychosocial interventions with adult cancer patients: A meta-analysis of randomized experiments. *Health Psychology, 14,* 101–108.

Miner, R. C., & Dowd, E. T. (1996). An empirical test of the problem solving model of depression and its application to the prediction of anxiety and anger. *Counselling Psychology Quarterly, 9,* 163–176.

Moore, J. E., & Chaney, E. F. (1985). Outpatient group treatment of chronic pain: Effects of spouse involvement. *Journal of Consulting and Clinical Psychology, 53,* 326–334.

Murray, R. P., Johnston, J. J., Dolce, J. J., Lee, W. W., & O'Hara, P. (1995). Social support for smoking cessation and abstinence: The Lung Health Study. *Addictive Behaviors, 20,* 159–170.

Nezu, A. M. (1986a). Efficacy of a social problem-solving therapy approach for unipolar depression. *Journal of Consulting and Clinical Psychology, 54,* 196–202.

Nezu, A. M. (1986b). Negative life stress and anxiety: Problem solving as a moderator variable. *Psychological Reports, 58,* 279–283.

Nezu, A. M. (in press). *Problem solving and behavior therapy revisited*. *Behavior Therapy*.

Nezu, A. M., & D'Zurilla, T. J. (1989). Social problem solving and negative affective states. In P. C. Kendall & D. Watson (Eds.), *Anxiety and depression: Distinctive and overlapping features* (pp. 285–315). New York: Academic Press.

Nezu, A. M., Lombardo, E., & Nezu, C. M. (in press). Cancer. In A. Kuczmierczyk & A. Nikcevic (Eds.), *A clinician's guide to behavioural medicine: A case formulation approach*. London, England: Routledge.

Nezu, A. M., Nezu, C. M., Faddis, S., DelliCarpini, L. A., & Houts, P. S. (1995, November). *Social problem solving as a moderator of cancer-related stress*. Paper presented to the Association for Advancement of Behavior Therapy, Washington, DC.

Nezu, A. M., Nezu, C. M., Felgoise, S. H., & Zwick, M. L. (2003). Psychosocial oncology. In I. B. Weiner (Series Ed.) & A. M. Nezu, C. M. Nezu, & P. A. Geller (Vol. Eds.), *Handbook of psychology: Vol. 9. Health psychology* (pp. 267–292). New York: Wiley.

Nezu, A. M., Nezu, C. M., Friedman, S. H., Faddis, S., & Houts, P. S. (1998). *Helping cancer patients cope: A problem-solving approach*. Washington, DC: American Psychological Association.

Nezu, A. M., Nezu, C. M., Houts, P. S., Friedman, S. H., & Faddis, S. (1999). Relevance of problem-solving therapy to psychosocial oncology. *Journal of Psychosocial Oncology, 16,* 5–26.

Nezu, A. M., Nezu, C. M., McClure, K. S., & Zwick, M. L. (2002). Assessment of depression. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression and its treatment* (pp. 61–85). New York: Guilford Press.

Nezu, A. M., Nezu, C. M., & Perri, M. G. (1989). *Problem-solving therapy for depression: Theory, research, and clinical guidelines*. New York: Wiley.

Nezu, A. M., Nezu, C. M., Saraydarian, L., Kalmar, K., & Ronan, G. F. (1986). Social problem solving as a moderating variable between negative life stress and depression. *Cognitive Therapy and Research, 10,* 489–498.

Nezu, A. M., & Perri, M. G. (1989). Problem-solving therapy for unipolar depression: An initial dismantling investigation. *Journal of Consulting and Clinical Psychology, 57,* 408–413.

Nezu, A. M., Perri, M. G., Nezu, C. M., & Mahoney, D. (1987, November). *Social problem solving as a moderator of stressful events among clinically depressed individuals*. Paper presented to the Association for Advancement of Behavior Therapy, Boston.

Nezu, A. M., & Ronan, G. F. (1985). Life stress, current problems, problem solving, and depressive symptoms: An integrative model. *Journal of Consulting and Clinical Psychology, 53,* 693–697.

Nezu, A. M., & Ronan, G. F. (1988). Problem solving as a moderator of stress-related depressive symptoms: A prospective analysis. *Journal of Counseling Psychology, 35,* 134–138.

Nezu, A. M., Ronan, G. F., Meadows, E. A., & McClure, K. S. (Eds.). (2000). *Practitioner's guide to empirically based measures of depression*. New York: Kluwer Academic/Plenum Publishers.

Nezu, C. M., Nezu, A. M., Friedman, S. H., Houts, P. S., DelliCarpini, L. A., Nemeth, C. B., & Faddis, S. (1999). Cancer and psychological distress: Two investigations regarding the role of problem solving. *Journal of Psychosocial Oncology, 16,* 27–40.

Priester, M. J., & Clum, G. A. (1993). Perceived problem-solving ability as a predictor of depression, hopelessness, and suicide ideation in a college population. *Journal of Counseling Psychology, 40,* 79–85.

Schag, C. C., & Heinrich, R. L. (1989). *Cancer Rehabilitation Evaluation System manual*. Santa Monica, CA: CARES Consultants.

Schag, C. C., Heinrich, R. L., Aadland, R. L., & Ganz, P. A. (1990). Assessing problems of cancer patients: Psychometric properties of the Cancer Inventory of Problem Situations. *Health Psychology, 9,* 83–102.

Spitzer, W. O., Dobson, A. J., Hall, J., Chesterman, E., Levi, J., Shepherd, R., et al. (1981). Measuring the quality of life of cancer patients: A concise QL-Index for use by physicians. *Journal of Chronic Disabilities, 34,* 585–597.

Telch, C. F., & Telch, M. J. (1986). Group coping skills instruction and supportive group therapy for cancer patients: A comparison of strategies. *Journal of Consulting and Clinical Psychology, 54,* 802–808.

Weisman, A. D., Worden, J. W., & Sobel, H. J. (1980). *Psychosocial screening and intervention with cancer patients: Research report*. Boston: Harvard Medical School.

Zabora, J. R., Smith-Wilson, R., Fetting, J. H., & Enterline, J. P. (1990). An efficient method for psychosocial screening of cancer patients. *Psychosomatics, 31,* 192–196.

Appendix

Activities Associated With Four Rational Problem-Solving Tasks

Problem Definition and Formulation
- Gather all available facts about the problem
- Describe these facts in clear and unambiguous terms
- Differentiate between facts and assumptions
- Identify those factors that make the situation a problem
- Set realistic problem-solving goals

Generation of Alternatives
- Generate a comprehensive list of alternative solutions
- Defer critical judgment
- Think of general strategies, as well as tactics for each strategy, when generating possible solution ideas

Decision Making
- Evaluate each alternative by rating (a) the likelihood that the alternative, if implemented optimally, will achieve the desired goals, and (b) the value of the alternative in terms of personal, social, long-term, and short-term consequences
- Choose the alternative(s) that have the highest utility

Solution Implementation and Verification
- Carry out the chosen plan
- Monitor the effects of the implemented solution
- Compare or match the predicted and actual effects
- Self-reinforce if the match is satisfactory: Recycle through the process if the match is unsatisfactory

Received June 10, 2002
Revision received March 10, 2003
Accepted March 13, 2003 ■