

Development and Preliminary Evaluation of the Social Problem-Solving Inventory

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The Social Problem-Solving Inventory (SPSI) is a 70-item, multidimensional, self-report measure of social problem-solving ability that is based on the prescriptive model developed previously by D'Zurilla and his associates. The SPSI consists of 2 major scales and 7 subscales. The 2 major scales are the Problem Orientation Scale (POS) and the Problem-Solving Skills Scale (PSSS). Subsumed under the POS are 3 subscales: the Cognition subscale, the Emotion subscale, and the Behavior subscale. The PSSS is divided into 4 subscales: the Problem Definition and Formulation subscale, the Generation of Alternative Solutions subscale, the Decision Making subscale, and the Solution Implementation and Verification subscale. From samples of undergraduate college students and middle-aged community residents, preliminary data concerning the reliability and validity of the SPSI are presented. Collectively, these data suggest strongly that the SPSI has sound psychometric properties, is a promising multicomponent measure of social problem-solving ability, and can be useful for both research and clinical assessment.

In recent years, there has been a growing interest in research on social problem solving (i.e., real-life problem solving) and problem-solving therapy (i.e., the clinical application of problem-solving training; see D'Zurilla, 1986, in press; Nezu & D'Zurilla, 1989; Nezu, Nezu, & Perri, 1989). This research has been concerned with the relations among problem-solving ability, social competence and adaptation, stress, and various forms of maladjustment and psychopathology. Studies focusing on problem-solving therapy have attempted to demonstrate its efficacy as an intervention strategy for a variety of disorders ranging from minor maladjustments (e.g., Richards & Perri, 1978) to severe psychopathology (e.g., Nezu, 1986).

Much of this research has been based on the prescriptive model of social problem solving developed by D'Zurilla and his associates (D'Zurilla, 1986, 1988; D'Zurilla & Goldfried, 1971; D'Zurilla & Nezu, 1982; Nezu et al., 1989). This model characterizes social problem solving as a complex, cognitive-affective-behavioral process that consists of a number of different components, including general motivational variables and a set of specific skills. One factor that has hampered research in this area involves the lack of a comprehensive, multidimensional measure of social problem-solving ability that would allow an investigator to isolate, study, and compare the different components of this complex process. For example, certain individuals with problem-solving deficits might be quite effective in generating a wide range of alternative solutions for problems but be very poor in judging and evaluating these alternatives. Another

person might have difficulties in defining problems and generating alternative solutions but be able to effectively implement and evaluate solutions when they are provided by someone else. A measure that assesses a person's strengths and deficiencies across the various problem-solving components would allow for a better understanding of the crucial variables that are related to adjustment, as well as facilitate the development of effective problem-solving training programs (cf. Nezu & Perri, 1989). The present article attempts to correct this gap in research and clinical assessment related to social problem solving by presenting the Social Problem-Solving Inventory (SPSI), which is derived from the prescriptive model of D'Zurilla and his associates.

The Social Problem-Solving Model

Within our model, the term *social problem solving* refers to the cognitive-affective-behavioral process by which a person attempts to identify, discover, or invent effective or adaptive coping responses for specific problematic situations encountered in everyday living (D'Zurilla, 1986; D'Zurilla & Nezu, 1982). The adjective *social* is not meant to restrict problem solving to any particular type of problem. Instead, it is used here to emphasize two points: (a) that we are interested in problem solving that takes place in the real-life social environment, and (b) that we view real-life problem solving as both a social learning process and a social skill (D'Zurilla, 1986). This strategy may be applied to all kinds of problems in living, including personal or individual problems, interpersonal problems, small-group problems (e.g., family conflicts) and broader social problems (e.g., community issues).

The social problem-solving process consists of (a) a general motivational component called *problem orientation*, and (b) a set of four specific *problem-solving skills*. The problem-orientation component does not include the skills and abilities that enable a person to solve a particular problem successfully. Nor

We gratefully acknowledge the invaluable assistance of Collette Sheedy and Gale Maschka in the data collection and statistical analyses. We also thank Christine M. Nezu and two anonymous reviewers for their helpful comments and suggestions on an earlier draft of this article.

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does it include the specific perceptions and appraisals that are associated with specific problematic situations. Instead, this part of the problem-solving process focuses on the generalized cognitive-affective-behavioral response set that the person brings to specific problematic situations, which is based primarily on that individual's past experiences with problems in living and problem solving as a means of coping with them (see Nezu et al., 1989). This general response set can influence the problem perceptions and appraisals made in specific situations. Furthermore, it can have a generalized facilitative or inhibitive effect on one's problem-solving performance, influencing the initiation of problem-solving activities, the efficiency of performance, and the amount of time and effort expended to cope with obstacles and consequent emotional distress.

The *cognitive* subcomponent of problem orientation includes an attentional set to recognize problems when they occur and a set of generalized and relatively stable attributions, appraisals, expectancies, and commitments concerning problems and independent problem solving as a means of coping with them. These cognitive variables include beliefs about the causes of problems, appraisals of their significance for well-being, personal-control beliefs and expectancies, and commitments of time and effort to independent problem solving. The *emotional* subcomponent of problem orientation consists of the immediate emotional states that are generally associated with problematic situations. These emotional states may include negative affect (e.g., anxiety, anger, and depression), positive affect (e.g., exhilaration, hope, and eagerness), or a mixture of the two (Schwartz & Weinberger, 1980). The *behavioral* subcomponent of the problem-orientation set focuses on behavioral approach-avoidance tendencies regarding problems in living and independent problem solving. An approach orientation involves the tendency to confront problems and handle them with dispatch. An avoidance orientation involves the tendency to put off dealing with problems or to depend on others to solve them.

The problem-solving skills component of the model consists of a set of four particular goal-directed tasks: (a) problem definition and formulation; (b) generation of alternative solutions; (c) decision making; and (d) solution implementation and verification (i.e., monitoring and evaluation of solution outcome). According to our model, these are the skills that are required to solve a particular problem effectively. Each skilled task has its own distinct and important contribution toward the discovery of an effective or adaptive solution. The goal of *problem definition and formulation* is to obtain relevant, factual information about the problem, clarify the nature of the problem, and delineate a set of realistic problem-solving goals. The goal of *generation of alternative solutions* is to identify, discover, or create as many solution alternatives as possible in such a way as to maximize the likelihood that the best possible solution or solutions will be among them. In *decision making*, the objective is to judge and compare the different alternatives and choose the best overall solution for implementation within the actual problematic situation. The purpose of the fourth skilled task, *solution implementation and verification*, is to self-monitor and evaluate the actual outcome after the solution is implemented.

In addition, D'Zurilla (1986) made an important distinction between problem-solving ability and problem-solving performance. The former refers to the process that enables a person to find an effective or adaptive solution, whereas the latter fo-

cuses on the outcome of this process when applied to a particular problem (i.e., the chosen solution). Measures of problem-solving ability should assess a person's knowledge or possession of the important attitudes, beliefs, and skills that make up the problem-solving process. The assessment of problem-solving performance, on the other hand, should evaluate the quality of self-reported or observed solutions for specific problems. This distinction is important because it helps to avoid a confounding of measures of process and outcome in social problem-solving research.

Problem-solving ability measures are important for assessing problem-solving deficits, planning an individualized training program, assessing training progress, and making predictions about adaptational outcomes (e.g., psychological symptoms and social competence). Problem-solving performance measures are useful for evaluating the validity of a particular problem-solving model, the validity of a particular measure of problem-solving ability, and the outcome of a particular training program.

General Description of the SPSI

The SPSI is a 70-item, multidimensional, self-report measure of social problem-solving ability that was designed to assess the major components of the social problem-solving model. It consists of two major scales and seven subscales. The two major scales are the Problem Orientation Scale (POS) and the Problem Solving Skills Scale (PSSS). Included within the POS are the Cognition subscale (CS), the Emotion subscale (ES), and the Behavior subscale (BS), which were constructed to reflect the cognitive, emotional, and behavioral response sets that encompass the problem-orientation component of the overall model. Subsumed under the PSSS are the Problem Definition and Formulation subscale (PDFS), the Generation of Alternative Solutions subscale (GASS), the Decision Making subscale (DMS), and the Solution Implementation and Verification subscale (SIVS). These subscales are designed to reflect the four skilled tasks within the model that enable a person to solve a specific problem effectively.

Each item of the SPSI is a self-statement reflecting either a positive (facilitative) or negative (inhibitive) cognitive, affective, or behavioral response to real-life problem-solving situations. One half of the items are positive, and the other half are negative. These items are arranged in random order throughout the SPSI. Each item is rated on a 5-point scale ranging from *not at all true of me* (0) to *extremely true of me* (4). The SPSI can be scored for the seven subscales, the two major scales, and the total inventory. Ratings for the negative items are reversed when scoring the SPSI, so that higher scores always reflect greater problem-solving ability. The instructions for the administration of the SPSI are as follows:

Below are a series of statements that describe the way some people might think, feel, and behave when they are faced with problems in everyday living. We are talking about important problems that could have a significant effect on your well-being or the well-being of your loved ones, such as a health-related problem, a dispute with a family member, or a problem with your performance at work or in school. Please read each statement and carefully select one of the numbers below which indicates the extent to which the statement is true of you. Consider yourself as you *typically* think, feel, and behave when you are faced with problems in living *these days* and

place the appropriate number in the parentheses () next to the number of the statement.

Development of the SPSI

On the basis of the overall conceptual structure just described, we constructed an initial pool of nearly 300 items to accurately reflect the relevant components of the social problem-solving model. We then screened this initial pool to eliminate items that were very similar or redundant, reducing the pool to 138 items. The number of items in each of the seven subscales at that point ranged from 15 to 24 items. An informal content validity study was then conducted to provide an independent evaluation of the degree to which the items in each subscale actually represented the relevant components of the social problem-solving model. Ten graduate students in clinical psychology at Fairleigh Dickinson University who had extensive experience with the social problem-solving model were asked to rate the items in each subscale on a 7-point scale ranging from *item does not address this subscale at all* (1) to *item addresses this subscale very much* (7). We arbitrarily decided to retain an item if it received a mean rating of at least 6. All of the 138 items met this initial criterion.

This initial 138-item SPSI was then administered to 260 undergraduate college students enrolled in the introductory psychology course at the State University of New York at Stony Brook during the fall of 1987. These students completed the SPSI as part of a course requirement to participate in psychological research. The sample was 58% female and 42% male. The mean age was 19.6 years. Although no data were collected on ethnic/racial background for this particular sample, the undergraduate population at Stony Brook during the fall of 1987 was 72% White, 11.9% Asian-American, 7.9% Black, and 5.0% Hispanic. The remaining 3.2% were Native American and foreign students. Using the data from this sample, we computed correlation coefficients to determine the relation between each of the 138 items and all seven subscales, as well as the two major scales. On the basis of these correlations, we then selected 10 items from each of the seven subscales that had the highest correlations with their own subscale and scale scores and had relatively low correlations with the divergent subscale and scale scores. The correlations between these items and their corresponding subscale scores ranged from .47 to .80. The correlations with their corresponding scale scores ranged from .41 to .79. Thus, the present version of the SPSI consists of 70 items, with 30 items in the Problem Orientation Scale, 40 items in the Problem-Solving Skills Scale, and 10 items in each of the seven subscales. All subsequent analyses involving SPSI scores are based on these 70 items.

SPSI Means and Standard Deviations

The 70-item SPSI was administered to three new samples of subjects. The first sample consisted of 192 undergraduate students who were enrolled in the introductory course in psychology at Stony Brook during the fall of 1988. This group was 60% female and 40% male, with a mean age of 19.8 years. The ethnic/racial composition of the undergraduate population at Stony Brook at this time was virtually the same as in the fall of 1987 (previously stated). The second sample consisted of 107

undergraduates from Fairleigh Dickinson University who, like the two Stony Brook samples, participated in the study to fulfill requirements of their introductory psychology courses. This group was 53% male and 47% female. Their mean age was 21.3 years. Approximately 90% of this sample were White and 10% were Black.

The third new sample of subjects consisted of 45 high-stressed, middle-aged, community residents who volunteered to participate in a stress-management research program conducted at the State University of New York at Stony Brook. This sample included 28 women and 17 men and had a mean age of 44.3 years. All of the subjects were White, with at least a high school education, and all were working full time at the time of the testing. They represented a wide range of occupations, including office worker, secretary, engineer, computer programmer, carpenter, social worker, teacher, electrician, probation officer, business executive, salesperson, biologist, and college professor. The designation *high stressed* for this particular sample was based on a mean total stress score (area *T* score) of 61.41 on the Derogatis Stress Profile (DSP; Derogatis, 1980, 1987). An area *T* score of 60 on the DSP represents one standard deviation above the mean for the normative population for the DSP and separates the highest scoring 16% of the population. The means and standard deviations for these three samples are presented in Table 1. Note the similarity between the two college student samples (Stony Brook and Fairleigh Dickinson) and the difference between these samples and the community sample.

Reliability of the SPSI

Two types of reliability were assessed: test-retest reliability and internal consistency. The former is a measure of temporal stability, and the latter is a measure of item homogeneity. The reliability coefficients for these two types of reliability are presented in Table 2. The test-retest coefficients are based on a subset of 89 subjects from the 1987 Stony Brook sample. These subjects completed the SPSI twice; the average time between test administrations was 3 weeks. The internal consistency coefficients (Cronbach's alpha) are based on the 1988 Stony Brook sample ($n = 192$). The reliability coefficients in Table 2 indicate good levels of temporal stability and item homogeneity for the total SPSI, as well as for the two major scales. The test-retest coefficients for the total SPSI, the Problem Orientation Scale, and the Problem-Solving Skills Scale are .87, .83, and .88, respectively. The alpha coefficients for the same measures are .94, .94, and .92, respectively. The coefficients in Table 2 also show respectable levels of temporal stability and item homogeneity for most of the subscales. The test-retest coefficients range from a high of .86 for the Problem Definition and Formulation subscale to a low of .73 for the Cognition subscale. The alpha coefficients for all of the subscales except Solution Implementation and Verification range from .90 (Emotion) to .74 (Cognition). The Solution Implementation and Verification subscale has an alpha coefficient of .65.

Interrelationships Among the SPSI Measures

If the SPSI is a true multidimensional measure of social problem-solving ability, then one would expect the subscales to show relatively high correlations with their corresponding scale

Table 1
SPSI Means and Standard Deviations for Two Samples of Undergraduate College Students
and a Sample of High-Stressed Community Residents

Measure	Sample					
	Stony Brook ^a (1988)		Fairleigh Dickinson ^b		Community ^c	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Subscales						
CS	25.84	5.80	26.67	6.64	22.68	6.37
ES	23.23	8.59	23.31	7.79	16.66	8.33
BS	24.55	7.78	25.68	7.77	23.09	7.81
PDFS	23.00	6.39	24.22	5.83	19.34	7.82
GASS	21.86	6.05	23.09	5.94	20.30	7.84
DMS	24.23	5.86	24.65	6.80	21.41	7.65
SIVS	22.02	5.03	23.94	6.17	20.91	5.88
Scales						
POS	73.56	20.15	77.67	19.58	62.66	17.88
PSSS	91.31	19.88	96.41	25.85	81.96	26.96
SPSI	165.20	33.24	171.08	35.73	144.64	40.43

Note. CS = Cognition subscale; ES = Emotion subscale; BS = Behavior subscale; PDFS = Problem Definition and Formulation subscale; GASS = Generation of Alternative Solutions subscale; DMS = Decision Making subscale; SIVS = Solution Implementation and Verification subscale; POS = Problem Orientation Scale; PSSS = Problem-Solving Skills Scale; SPSI = Social Problem-Solving Inventory.

^a *n* = 192; mean age = 19.8 years. ^b *n* = 107; mean age = 21.3 years. ^c *n* = 45; mean age = 44.3 years.

scores and with the total SPSI score but relatively low correlations with the divergent scale score. Furthermore, the two major scales should show a relatively low correlation with each other. Table 3 shows the pattern of correlations between the SPSI's subscale scores and the scale scores and total score for the 1988 Stony Brook sample. In calculating these correlations, we removed the relevant subscale items from the corresponding scale and the total score to avoid an inflated correlation owing

to overlapping items. The pattern of correlations is consistent with expectations. The average correlation between the Problem-Orientation subscales and the Problem Orientation Scale score is .79, whereas the average correlation between these subscales and the Problem-Solving Skills Scale score is only .34. Similarly, the average correlation between the Problem-Solving Skills subscales and the Problem-Solving Skills Scale score is .73, whereas the average correlations with the Problem Orientation Scale score is only .31. The correlations between the SPSI's subscales and the total score are all relatively high, with an aver-

Table 2
Test-Retest and Internal Consistency (Cronbach's Alpha)
Reliability Coefficients for the SPSI Measures

Measure	Test-Retest ^a	Internal consistency ^b
Subscales		
CS	.73	.74
ES	.83	.90
BS	.79	.86
PDFS	.86	.85
GASS	.84	.78
DMS	.78	.75
SIVS	.85	.65
Scales		
POS	.83	.94
PSSS	.88	.92
SPSI	.87	.94

Note. CS = Cognition subscale; ES = Emotion subscale; BS = Behavior subscale; PDFS = Problem Definition and Formulation subscale; GASS = Generation of Alternative Solutions subscale; DMS = Decision Making subscale; SIVS = Solution Implementation and Verification subscale; POS = Problem Orientation Scale; PSSS = Problem-Solving Skills Scale; SPSI = Social Problem-Solving Inventory.

^a *n* = 89 undergraduate college students. ^b *n* = 192 undergraduate college students.

Table 3
Correlations of SPSI Subscales With
SPSI Scales and Total SPSI

Measure	POS	PSSS	SPSI
Subscales			
CS	.78	.40	.69
ES	.82	.26	.56
BS	.78	.37	.65
PDFS	.21	.71	.50
GASS	.37	.80	.68
DMS	.35	.70	.62
SIVS	.31	.71	.60
Scales			
POS	—	.36	—
PSSS	.36	—	—

Note. *n* = 192 undergraduate college students. CS = Cognition subscale; ES = Emotion subscale; BS = Behavior subscale; PDFS = Problem Definition and Formulation subscale; GASS = Generation of Alternative Solutions subscale; DMS = Decision Making subscale; SIVS = Solution Implementation and Verification subscale; POS = Problem Orientation Scale; PSSS = Problem-Solving Skills Scale; SPSI = Social Problem-Solving Inventory.

Table 4
Correlations Among the Subscales of the SPSI

Measure	CS	ES	BS	PDFS	GASS	DMS	SIVS
POS							
CS	—	.75	.70	.28	.39	.33	.33
ES		—	.76	.12	.28	.27	.20
BS			—	.20	.38	.36	.31
PSSS							
PDFS				—	.67	.56	.66
GASS					—	.71	.63
DMS						—	.57
SIVS							—

Note. $n = 192$ undergraduate college students. SPSI = Social Problem-Solving Inventory; CS = Cognition subscale; ES = Emotion subscale; BS = Behavior subscale; PDFS = Problem Definition and Formulation subscale; GASS = Generation of Alternative Solutions subscale; DMS = Decision Making subscale; SIVS = Solution Implementation and Verification subscale; POS = Problem Orientation Scale; PSSS = Problem-Solving Skills Scale.

age correlation of .61. Finally, the Problem Orientation Scale and the Problem-Solving Skills Scale correlate only .36 with each other.

The pattern of correlations among the SPSI's subscales is shown in Table 4. These data are also based on the 1988 Stony Brook sample. As expected, the correlations between subscales within each scale are higher than the correlations with divergent subscales. More specifically, the average correlation between the Problem Orientation subscales is .74 and between the Problem-Solving Skills subscales is .63, whereas the average correlation between the divergent subscales is only .29. Taken together, these results provide some initial support for the hypothesized structural composition of the SPSI.

Validity of the SPSI

In addition to the content validity data reported earlier, preliminary data relevant to concurrent validity, construct validity, and predictive validity were also obtained. These results are based on data from all four subject samples. In cases in which a particular measure was correlated with alternative SPSI measures within the same sample of subjects, significance levels were adjusted for error rates according to the Bonferroni method.

Concurrent Validity

Concurrent validity was assessed by comparing the SPSI with two other self-report instruments that were designed to measure certain aspects of social problem solving, namely, the Problem-Solving Inventory (PSI) (Heppner & Petersen, 1982) and the Means-Ends Problem-Solving (MEPS) Procedure (Platt & Spivack, 1975). The PSI is a 32-item self-report measure of personal problem solving that was based on the original version of the present social problem-solving model (D'Zurilla & Goldfried, 1971). The MEPS is a more narrow and limited measure of social problem-solving ability in that it focuses primarily on the ability to conceptualize relevant means toward achieving a specific interpersonal or social goal. Within the present model, means-ends ability is conceived as one of the important skills

embedded within the problem-solving task labeled "Generation of Alternative Solutions."

The correlations between the SPSI measures and the PSI are based on a subset of 75 subjects from the 1988 Stony Brook sample. The correlations with the MEPS are based on the entire Fairleigh Dickinson sample ($n = 107$). Contrary to the SPSI scoring system, low scores on the PSI indicate high problem-solving ability. The correlations between the PSI and the Problem Orientation Scale, the Problem-Solving Skills Scale, and the total SPSI were $-.67$, $-.60$, and $-.71$, respectively ($df = 73$, $p < .01$). The correlations between the PSI and the SPSI subscales ranged from a high of $-.63$ with the Emotion subscale to a low of $-.45$ with the Generation of Alternative Solutions subscale. Correlations between the MEPS and the SPSI were also significant. The MEPS correlated .61, .65, and .73 with the Problem Orientation Scale, the Problem-Solving Skills Scale, and the total SPSI, respectively ($df = 105$, $p < .01$). Correlations between the MEPS and the SPSI subscales ranged from a high of .63 with the Generation of Alternative Solutions subscale, as predicted, to a low of .50 with the Cognition and Emotion subscales. Collectively, these data indicate a significant degree of commonality between the SPSI and other measures of social problem-solving ability but not to the extent that the SPSI could be viewed as redundant.

Construct Validity

Theoretically, perceived-control expectancies are considered to be an important part of the problem-orientation component of the problem-solving process (D'Zurilla, 1986; Nezu et al., 1989). Because the locus-of-control construct is similar to the perceived-control expectancies in the present social problem-solving model, we compared SPSI measures with scores on the Internal-External Locus of Control Scale (I-E Scale; Rotter, 1966). This analysis was based on a subset of 105 subjects from the 1987 Stony Brook sample. It should be noted that low scores on the I-E Scale reflect a more internal locus of control. The total SPSI and the Problem Orientation Scale correlated significantly with the I-E Scale at the .01 level, $r(103) = -.29$ and $-.32$, respectively. However, the correlation with the Problem-

Solving Skills Scale was only marginally significant, $r(103) = -.19, p < .10$. The correlations between the I-E Scale and the Problem Orientation subscales ranged from $-.34$ (Cognition) to $-.27$ (Behavior), whereas the correlations with the Problem-Solving Skills subscales ranged from $-.23$ (Solution Implementation and Verification) to $-.09$ (Decision Making).

The finding that the I-E Scale is more highly related to the Problem Orientation Scale than to the Problem-Solving Skills Scale is not surprising, because the internal-control construct is more closely associated with a person's generalized problem-solving *cognitive set* (e.g., causal attributions and personal-control expectancies) than with his or her specific problem-solving *skills* (e.g., ability to generate alternatives and decision-making skills). The fact that the Solution Implementation and Verification subscale had the highest correlation with the I-E Scale among the Problem-Solving Skills subscales was also expected because this skilled task is basically a self-control process (i.e., solution performance, self-monitoring, self-evaluation, and self-reinforcement; Kanfer, 1975). As such, it may contribute to the strength and maintenance of perceived control.

We also compared the SPSI with several measures designed to reflect *divergent* or dissimilar constructs. Previous studies have suggested that social problem-solving ability may be relatively independent from the construct of general intelligence as measured by traditional IQ tests and measures of academic ability (Guilford, 1977; Heppner & Petersen, 1982; Spivack, Platt, & Shure, 1976). Therefore, correlations were computed between SPSI measures and Scholastic Aptitude Test (SAT) scores (total, verbal, and math) in a group of 102 subjects from the 1988 Stony Brook sample. None of the SPSI measures was found to be significantly correlated with any of the SAT scores. Therefore, consistent with the findings of previous studies using other measures of social problem solving, the SPSI does not appear to be related to the traditional construct of general intelligence or academic ability.

We also investigated the sensitivity of the SPSI to problem-solving training effects. Twenty-seven subjects from the sample of high-stressed community residents participated in a comparative outcome study on stress management (D'Zurilla & Maschka, 1988). These subjects were randomly assigned to one of two treatment conditions: (a) problem-solving training (PST; $n = 13$) or (b) social-communication training (SCT; $n = 14$). PST focused on training in a general problem-solving coping strategy based on the same social problem-solving model that was used to derive the SPSI. SCT involved training in the mutual exchange of social support (e.g., empathic understanding, factual information, and advice). No systematic training in problem-solving orientation or skills was involved in this treatment condition.

Nine PST subjects and 9 SCT subjects completed all testing requirements at pretreatment and posttreatment, which included the SPSI. Initially, an analysis of the pretreatment measures showed no significant differences between the PST group and the SCT group on any of the three major SPSI measures (Problem-Orientation Scale, Problem-Solving Skills Scale, and total SPSI). The results of an analysis of variance on the pretreatment and posttreatment data indicated that the PST group improved significantly more than the SCT group on the Problem Orientation Scale, $F(1, 17) = 4.45, p = .05$, the Problem-Solving Skills Scale, $F(1, 17) = 4.61, p < .05$, and the total SPSI,

$F(1, 17) = 4.87, p < .05$. Collectively, these findings provide promising support for the construct validity of the SPSI.

Predictive Validity

According to social problem-solving theory, problem solving is viewed as an important coping strategy that increases general competence and adaptation while reducing stress and the likelihood of long-range negative stress outcomes (e.g., psychological symptoms; D'Zurilla, 1986, in press; Nezu, 1987; Nezu & D'Zurilla, 1989; Nezu, et al., 1989). Academic achievement is one sign of competence and adaptation within a college environment. To succeed academically, a student must learn to cope effectively with many new problems and challenges (e.g., increased time pressures, new course requirements, financial problems, and conflicts between academic demands and social pressures). Thus, although the SPSI appears to be unrelated to academic ability, it might be expected to correlate significantly with academic achievement or competence. To test this hypothesis, correlations were computed between the SPSI, which was administered at the beginning of the fall semester, and grade point average (GPA) achieved at the end of the semester in the 1988 Stony Brook sample ($n = 192$). The majority of these subjects (approximately 85%) were freshmen attending their first semester of college. Significant correlations were found with the total SPSI, $r(190) = .24, p < .01$, the Problem-Solving Skills Scale, $r(190) = .23, p < .01$, and the Problem Orientation Scale, $r(190) = .18, p < .05$. The correlations with the SPSI subscales ranged from $.34$ with the Decision Making subscale to $.09$ with the Problem Definition and Formulation subscale. These data provide some initial support for the hypothesis that social problem-solving abilities, as assessed by the SPSI, are related to competence or positive adaptation. Furthermore, the relatively high correlation with the Decision Making subscale suggests that evaluation and judgment abilities might be particularly important for competence in the academic area.

If effective problem solving reduces stress and negative stress outcomes, then a negative relationship should exist between SPSI scores and measures of stress and psychological symptoms. To obtain some preliminary data concerning this hypothesis, we computed correlations between the three major SPSI measures (Problem Orientation Scale, Problem-Solving Skills Scale, and total SPSI) and scores derived from the following instruments: (a) the Derogatis Stress Profile (DSP; Derogatis, 1980, 1987), (b) the Personal Problems Checklist (PPC; Schinka, 1984b), and (c) the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983). Two sets of correlations were obtained. One set is based on 181 subjects from the 1988 Stony Brook sample, and the second is based on 38 subjects from the community sample.

The DSP is a multidimensional self-report measure of psychological stress that is based on interactional stress theory (Lazarus & Folkman, 1984). The present study used the DSP's total stress score (TSS) and three stress domain scores: (a) the environmental events score (EES), (b) the personality mediators score (PMS), and (c) the emotional response score (ERS). The EES assesses domestic satisfaction, vocational satisfaction, and health posture (i.e., health habits and attitudes). The PMS is a measure of general personal-social characteristics that overlap with the Type A behavior pattern (e.g., perceived time pressure,

Table 5
Correlations Between SPSI Measures and Measures of Stress and Psychological Symptomatology in a College Student Sample and a Community Resident Sample

	College students ^a			Community residents ^b		
	POS	PSSS	SPSI	POS	PSSS	SPSI
DSP/TSS	-.52**	-.24**	-.45**	-.53**	-.49**	-.56**
DSP/EES	-.35**	-.24**	-.35**	-.42*	-.37*	-.43*
DSP/PMS	-.24**	.01	-.14	-.32*	-.39*	.40*
DSP/ERS	-.59**	-.29**	-.53**	-.53**	-.40*	.49**
PPC	-.35**	.09	-.26**	-.29	-.09	-.19
SCL-90-R	-.51**	-.10	-.37**	-.51**	-.33*	-.45**

Note. POS = Problem Orientation Scale; PSSS = Problem-Solving Skills Scale; SPSI = Social Problem-Solving Inventory; DSP = Derogatis Stress Profile; TSS = Total Stress Score; EES = Environmental Events Score; PMS = Personality Mediators Score; ERS = Emotional Response Score; PPC = Personal Problems Checklist; SCL-90-R = Symptom Distress Checklist-90-Revised Global Severity Index. The significance levels reported here are adjusted for error rates according to the Bonferroni method.

^a $n = 181$. ^b $n = 38$.

* $p < .05$. ** $p < .01$.

compulsive achievement strivings, and low relaxation potential; Rosenhan & Chesney, 1982). The ERS reflects one's level of general anxiety, depression, and hostility.

Whereas the DSP is a measure of general psychological stress, the PPC may be viewed more as a measure of specific stressful life events (i.e., specific life problems). It is a checklist of 208 possible problems in areas such as social relationships, appearance, vocation, family, and health. The subject simply checks those problems that are currently troubling him or her. The PPC score is the number of problems checked. The SCL-90-R is a self-report inventory of psychological symptoms that assesses nine primary symptom dimensions (e.g., somatization, obsessive-compulsive disorder, interpersonal sensitivity, depression, and phobic anxiety). The present study focused on a global severity score that reflects both the number and perceived intensity of psychological symptoms across the nine dimensions. Because the PPC and SCL-90-R scores were found to be highly positively skewed in the college student sample (but not in the community sample), a square root transformation was performed, and the transformed scores were used in the correlational analyses for this particular sample.

The results for the two samples are presented in Table 5. In general, the correlations in both samples support the hypotheses emanating from social problem-solving theory. Twenty nine of the 36 correlations in Table 5 are significant. Moreover, as expected, all of the significant correlations are negative, suggesting that psychological stress level, life problems, and psychological symptoms are all associated with problem-solving deficits. The pattern of correlations is similar in the two samples. The SPSI appears to be most highly related to total psychological stress, perceived environmental stress, and emotional stress. The correlations with Type A behavior, reported frequency of problems, and psychological symptoms tend to be lower. Moreover, these variables appear to be more highly associated with a negative problem orientation (e.g., negative cognitive appraisals and negative emotional responses) than with low problem-solving skills, especially in the college student sample. The lower correlations associated with the Problem-Solving Skills Scale in the college student sample could be a function of the higher level

of skills for most of the subjects in this sample, as compared with the subjects in the community sample (see means and standard deviations in Table 1). Likewise, the problem-solving skills in the community sample are probably higher than the level of skills in the general population because the majority of the subjects in this sample are relatively well-educated (college graduates) and relatively competent (employed full-time in white-collar jobs). Thus, higher correlations with the Problem-Solving Skills Scale might be found in lower functioning populations that tend to have a greater variability in skill levels.

With regard to the PPC, we note that these scores reflect only the reported frequency of current life problems. They do not reflect the perceived severity of problems, nor do they indicate how well the person is coping with current problems. Reported problem frequency may be related primarily to a negative problem orientation, whereas perceived problem severity or coping effectiveness, or both, may be more related to problem-solving skills. Again, this might be particularly true in populations with greater variability in problem-solving skills.

On the basis of the results reported above, one might also predict that improvements in problem-solving ability with training would be associated with reductions in stress and psychological symptoms, as well as increases in adaptive psychological resources. This prediction was confirmed in the D'Zurilla and Maschka (1988) stress-management outcome study described earlier. Increases on the three major SPSI measures (Problem Orientation Scale, Problem-Solving Skills Scale, and total SPSI) following treatment were found to be significantly correlated with reductions in DSP and SCL-90-R scores. Moreover, increases on the Problem-Solving Skills Scale and the total SPSI were also significantly correlated with reductions on the PPC and the Health Problems Checklist (Schinka, 1984a). In addition, increases on all three SPSI measures were found to be significantly correlated with increases on several measures of adaptive psychological resources, including the Culture-Free Self-Esteem Inventory (Battle, 1983), a modified form of the Assertion Inventory (Gambrill & Richey, 1975), and the Life Satisfaction Scale (self-ratings of life satisfaction in 15 different areas—e.g., job, marriage, friends, recreation, and health).

These important findings contribute further to the predictive validity of the SPSI.

Concluding Comment

The purpose in developing the SPSI was to make available a multidimensional self-report measure of social problem-solving ability that would be more useful for research and clinical practice than any of the existing social problem-solving tests. The preliminary data on the psychometric properties of the SPSI suggest that it is a promising measure of social problem-solving ability. More specifically, the SPSI was found to have good test-retest reliability and internal consistency. Furthermore, the various subscales of the SPSI were also demonstrated to be highly correlated with their corresponding scale scores and with the overall SPSI score while showing relatively low correlations with the divergent scale score. In addition, promising results concerning the content, concurrent, construct, and predictive validity of the SPSI were found with several different samples of subjects.

We believe that the different scales and subscales of the SPSI, which were designed to reflect different motivational and skill components of the complex social problem-solving process, will help to shed more light on the nature of individual differences in social problem-solving abilities and their relationships to various adaptational outcomes (e.g., social competence, emotional well-being, and psychological symptomatology). Moreover, we believe that the SPSI can be useful in outcome studies on problem-solving therapy for assessing specific problem-solving training effects. Finally, we suggest that the SPSI will be useful in clinical assessment for identifying specific problem-solving deficiencies and facilitating the development of more effective therapy and stress-management programs.

References

- Battle, J. (1983). *Enhancing self-esteem and achievement—A handbook for professionals*. Odessa, FL: Psychological Assessment Resources.
- Derogatis, L. R. (1980). *The Derogatis Stress Profile (DSP): A summary report*. Baltimore, MD: Clinical Psychometric Research.
- Derogatis, L. R. (1983). *The SCL-90-R: Administration, scoring, and procedures manual-II*. Baltimore, MD: Clinical Psychometric Research.
- Derogatis, L. R. (1987). The Derogatis Stress Profile (DSP): Quantification of psychological stress. *Advances in Psychosomatic Medicine*, 17, 30–54.
- D'Zurilla, T. J. (1986). *Problem-solving therapy: A social competence approach to clinical intervention*. New York: Springer Publishing.
- D'Zurilla, T. J. (1988). Problem-solving therapies. In K. S. Dobson (Ed.), *Handbook of cognitive-behavioral therapies* (pp. 85–135). New York: Guilford.
- D'Zurilla, T. J. (in press). Problem-solving training for effective stress management and prevention. *Journal of Cognitive Psychotherapy: An International Quarterly*.
- D'Zurilla, T. J., & Goldfried, M. R. (1971). Problem solving and behavior modification. *Journal of Abnormal Psychology*, 78, 107–126.
- D'Zurilla, T. J., & Maschka, G. (1988, November). *Outcome of a problem-solving approach to stress management: I. Comparison with social support*. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, New York, NY.
- D'Zurilla, T. J., & Nezu, A. (1982). Social problem solving in adults. In P. C. Kendall (Ed.), *Advances in cognitive-behavioral research and therapy* (Vol. 1, pp. 201–274). New York: Academic Press.
- Gambrill, E. D., & Richey, C. A. (1975). An assertion inventory for use in assessment and research. *Behavior Therapy*, 6, 550–561.
- Guilford, J. P. (1977). *Way beyond the IQ: Guide to improving intelligence and creativity*. Great Neck, NY: Creative Synergetic Associates.
- Heppner, P. P., & Petersen, C. H. (1982). The development and implications of a personal problem solving inventory. *Journal of Counseling Psychology*, 29, 66–75.
- Kanfer, F. H. (1975). Self-management methods. In F. H. Kanfer & A. P. Goldstein (Eds.), *Helping people change: A textbook of methods* (pp. 334–389). New York: Pergamon Press.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer Publishing.
- Nezu, A. M. (1986). Efficacy of a social problem-solving therapy approach for unipolar depression. *Journal of Consulting and Clinical Psychology*, 54, 196–202.
- Nezu, A. M. (1987). A problem-solving formulation of depression: A literature review and proposal of a pluralistic model. *Clinical Psychology Review*, 7, 121–144.
- Nezu, A. M., & D'Zurilla, T. J. (1989). Social problem solving and negative affective conditions. In P. C. Kendall & D. Watson (Eds.), *Anxiety and depression: Distinctive and overlapping features* (pp. 285–315). New York: Academic 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., & Perri, M. G. (1989). Social problem-solving therapy for unipolar depression: An initial dismantling study. *Journal of Consulting and Clinical Psychology*, 57, 408–413.
- Platt, J. J., & Spivack, G. (1975). *Manual for the Means-Ends Problem-Solving Procedure (MEPS): A measure of interpersonal cognitive problem-solving skills*. Philadelphia, PA: Hahnemann Community Mental Health/Mental Retardation Center.
- Richards, C. S., & Perri, M. G. (1978). Do self-control treatments last? An evaluation of behavioral problem solving and faded counselor contact as treatment maintenance strategies. *Journal of Counseling Psychology*, 25, 376–383.
- Rosenhan, R. H., & Chesney, M. A. (1982). Stress, Type A Behavior, and coronary heart disease. In L. Goldberger & S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (pp. 547–565). New York: Free Press.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80 (1, Whole No. 609).
- Schinka, J. A. (1984a). *Health Problems Checklist*. Odessa, FL: Psychological Assessment Resources.
- Schinka, J. A. (1984b). *Personal Problems Checklist*. Odessa, FL: Psychological Assessment Resources.
- Schwartz, G. E., & Weinberger, D. A. (1980). Patterns of emotional responses to affective situations: Relations among happiness, sadness, anger, fear, depression, and anxiety. *Motivation and Emotion*, 4, 175–190.
- Spivack, G., Platt, J. J., & Shure, M. B. (1976). *The problem-solving approach to adjustment*. San Francisco: Jossey-Bass.

Received June 6, 1989

Revision received September 18, 1989

Accepted October 2, 1989 ■