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Social Problem Solving as a Mediator of Stress-Related Depression and Anxiety in Middle-Aged and Elderly Community Residents'

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This study examined the relations between everyday problems, social problem solving, and depression and anxiety in middle-aged and elderly community residents, using a multidimensional measure of social problem-solving ability that assesses positive problem orientation, negative problem orientation, rational problem solving, impulsivity/carelessness style, and avoidance style. Wide problem-solving deficits were found to be significantly related to depression and anxiety in both age samples, no support was found for a moderator hypothesis which assumes that problem-solving ability interacts with everyday problems to reduce depression and anxiety. On the other hand, support was found in both samples for a mediational model which assumes that problem solving is an intervening variable that accounts to a significant degree for the causal relations between everyday problems and depression and anxiety. Although all five problem-solving dimensions were significantly related

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to depression and anxiety, negative problem orienration was found to contribute most to the significant mediating effect.

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In recent years, increasing numbers of researchers across different areas of psychology have begun to study problem solving as it occurs in the course of everyday living (see D'Zurilla, 1986; Nezu, Nezu, & Perri, 1989; Poon, Rubin, & Wilson, 1989; Sinnott, 1989; Sternberg & Wagner, 1986). In the clinical and counseling area, where everyday problem solving has come to be known as *social problem solving* (D'Zurilla & Nezu, 1982), investigators have been studying the role of problem-solving ability in psychological adjustment and behavior modification (see D'Zurilla, 1986; D'Zurilla & Goldfried, 1971; Nezu & D'Zurilla, 1989; Nezu et al., 1989). Two of the most well-documented findings that have emerged from this research are that social problem-solving ability is inversely related to both depression and anxiety (see Haaga et al., 1995; Nezu & D'Zurilla, 1989).

One explanation for these findings is that social problem-solving ability acts as a *moderator* of the relation between stressful life events and psychological distress (Nezu & D'Zurilla, 1989). In support of this hypothesis, several multiple-regression studies conducted by Nezu and his associates have found significant interactions between stressful life events and problem-solving ability when predicting both depression (Nezu, Nezu, Saraydarian, Kalmar, & Ronan, 1986; Nezu & Ronan, 1988) and anxiety (Nezu, 1986b). The nature of these interactions were such that the relations between stressful life events and psychological distress were significantly weaker for individuals with greater problem-solving ability than for those with lower problem-solving ability. However, in two other similar studies, problem-solving ability was found to bc significantly related to psychological distress but no significant interactions were found between stressful life events and problem solving (D'Zurilla & Sheedy, 1991; Miner, Dowd, & Blixt, 1993).

The different results in these studies might be related to the different measures of stressful life events that were used. The Nezu studies used a measure of major negative life events (e.g., divorce, job loss, death of a family member), whereas the studies by D'Zurilla and Sheedy (1991) and Miner et al. (1993) used a measure of everyday problems or "daily hassles" (e.g., an ongoing dispute with one's spouse, unreasonable demands at work, a chronic illness). Miner et al. have suggested that a *mediational* model might be more appropriate than a moderator model for conceptualizing the relationship between everyday problems, problem solving, and psychological distress. Mediator variables are often confused with moderator variables. A moderator is an independent variable that interacts with another independent variable to enhance predictability of some criterion variable (Baron & Kenny, 1986). A significant interaction effect means that the relationship between the predictor variable and the criterion depends on (or varies with) the level of the moderator variable (Cohen & Cohen, 1983). A mediator, on the other hand, is an intervening variable that occupies a position in a causal chain linking some antecedent variable to some outcome or criterion variable (Baron & Kenny, 1986). The central notion in a mediational model is that the mediator variable explains (or accounts for) a significant amount of the relationship between the antecedent variable and the criterion variable. In addition to being conceptually different, moderator and mediational models also require different kinds of research methodology (see Baron & Kenny, 1986; Folkman & Lazarus, 1988; Stone, 1985; Zedeck, 1971).

The results of one study by Nezu and Ronan (1985) add strength to the mediational hypothesis. Using path-analytic methods, these investigators found that a measure of the frequency of everyday problems had a direct effect on the level of depressive symptoms in college students, and also an indirect effect via a measure of social problem solving. However, this study did not determine the magnitude of the mediating effect of problem solving on the relationship between daily problems and depression.

Since the research in this area has focused primarily on young adult samples (i.e., undergraduate and graduate college students), one purpose of the present study was to extend the previous work by examining the relations between life stress, social problem solving, and depression and anxiety in two older samples—i.e., middle-aged and elderly community residents. We decided to focus on everyday problems rather than major stressful life events because the former stressors have been found to be more strongly related to psychological symptomatology in both young and older samples (Burks & Martin, 1985; DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Holahan, Holahan, & Belk, 1984; Kanner, Coyne, Schaefer, & Lazarus, 1981; Monroe, 1983; Nezu, 1986a; Nezu & Ronan, 1985). Hence, in view of the moderator–mediator issue when everyday problems are used to measure stress, a second purpose of the present study was to determine whether a moderator model or a mediational model would best fit our data.

The present study also differed from previous research in that a new multidimensional measure of social problem-solving ability was used, namely, the Social Problem-Solving Inventory—Revised (SPSI-R; D'Zurilla, Nezu, & Maydeu-Olivares, 1997; Maydeu-Olivares & D'Zurilla, 1996), whereas most previous studies have employed either the Problem-Solving Inventory (Heppner & Petersen, 1982) or the Means-Ends Problem-Solving Procedure (Platt & Spivack, 1975). Conceptual and methodological prob-

lems associated with the latter two measures have raised questions about their construct validity (see D'Zurilla & Maydeu-Olivares, 1995).

In this study, the following specific questions were addressed:

1. Does social problem-solving ability predict depressive and anxiety symptomatology in middle-aged and elderly community residents beyond what is predicted by their current level of problems?
2. What is the role of social problem solving in the relationship between level of problems and depression and anxiety in these two age samples: that of a moderator variable or a mediator variable?
3. What is the role of age in this relationship? If age has significant effects on anxiety and depression, are they additive or does age interact with problems or problem-solving ability—i.e., is age a moderator variable?

METHOD

Subjects

Relatively healthy, community-dwelling volunteers were sought for participation in the study by appealing to a number of civic, social, and religious organizations in the greater Pittsburgh, Pennsylvania, area. Efforts were made to recruit both elderly and middle-aged subjects from the same sites whenever possible. In exchange for their participation in the study, all volunteers were offered a free workshop on problem solving as a means of reducing stress, to be conducted by the first author following the completion of the study.

Data were initially obtained from a total of 214 older and middle-aged volunteers. In an attempt to screen out individuals with severe cognitive and/or verbal skill deficits, the following exclusion criteria were employed, based on the subjects' responses on a background questionnaire, a self-administered verbal IQ test, and three of the major study measures: (a) inability to recall routine personal information, such as age and place of birth; (b) inability to demonstrate orientation as to, time, place, and person; (c) a standard T-score less than 41 on the Shipley Vocabulary subtest (Shipley, 1940; Zachary, 1986); and (d) three or more unanswered items on any of the self-report measures of social problem solving, depression, and anxiety. On the basis of these criteria, 14 potential subjects were excluded. The final samples consisted of 100 elderly subjects and 100 middle-aged subjects, with 70 women and 30 men in each age group. The older sample ranged in age from 60 to 80 years with a mean of 69 years, *SD* =

5.4, while the younger sample ranged from 40 to 55 years with a mean of 46.5 years, *SD* = 4.7. Additional information concerning the ethnicity, education, marital status, and employment status of the subjects in these two samples is presented in Table I.

Measures

Social Problem-Solving Ability

As noted earlier, social problem-solving abilities were assessed by means of the Social Problem-Solving Inventory—Revised (D'Zurilla et al., 1997; Maydeu-Olivares & D'Zurilla, 1996). The SPSI-R is a 52-item revised version of the Social Problem-Solving Inventory (SPSI; D'Zurilla & Nezu, 1990). The latter instrument is linked to a problem-solving model which assumes that problem-solving outcomes in the real world are largely deterinined by two major, partially independent processes: (1) problem orientation and (2) problem solving proper. Problem orientation is the motivational part of the problem-solving process, involving the operation of a set of relatively stable cognitive-emotional schemas that describe how a per-

Table I. Demographic Characteristics of the Elderly and Middle-Aged Samples

Characteristic	Elderly sample[a]	Middle-aged sample[b]
Ethnicity (%)		
White	98	93
Black	2	4
Asian American	0	3
Education (years)		
M	13.85	16.77
SD	2.61	2.58
Marital status (%)		
Single	4	9
Married	66	79
Divorced/separated	2	8
Widowed	28	4
Employment status (%)		
Employed	19	88
Homemaker	21	12
Retired	58	0
Disabled	2	0

[a] $n = 100$. [b] $n = 100$.

son generally thinks and feels about problems in living, as well as his or her own problem-solving ability (e.g., challenge and threat appraisals, problem-solving self-efficacy expectancies, outcome expectancies). Problem solving proper, on the other hand, refers to the search for a solution through the rational application of problem-solving skills that are designed to maximize the probability of finding the "best" or most adaptive solution for a particular problem (e.g., problem definition and formulation, generation of alternative solutions). Hence, the SPSI consists of two major scales—the Problem Orientation scale and the Problem-Solving Skills scale—which were designed to assess these two major components of the problem-solving process.

A recent factor-analytic study of the SPSI (Maydeu-Olivares & D'Zurilla, 1996) found that it is actually measuring two different, albeit related, problem orientation dimensions (positive and negative) and three partially independent problem-solving proper dimensions (rational problem solving, impulsive/careless problem solving, and avoidance behavior). On the basis of these results, D'Zurilla et al. (1997) constructed a revised SPSI (the SPSI-R) consisting of the following five major scales: (1) Positive Problem Orientation (PPO; 5 items), (2) Negative Problem Orientation (NPO; 10 items), (3) Rational Problem Solving (RPS; 20 items), (4) Impulsivity/Carelessness Style (ICS; 10 items), and (5) Avoidance Style **(AS;** 7 items). PPO measures a constructive, problem-solving cognitive "set" that involves the general tendencies to (a) appraise a problem as a challenge, (b) believe in one's own problem-solving capabilities, (c) expect positive problem-solving outcomes, and (d) commit time and effort to solving problems with dispatch rather than avoiding them. NPO assesses a dysfunctional cognitive-emotional set consisting of the general tendencies to (a) appraise a problem as a threat; (b) doubt one's own problem-solving capabilities; (c) expect negative problem-solving outcomes; and (d) easily become upset, frustrated, and discouraged when attempting to solve problems in living. RPS reflects a constructive problem-solving pattern involving the deliberate, systematic, and skillful application of effective or adaptive problem-solving skills and techniques. ICS assesses a dysfunctional problem-solving pattern characterized by active attempts to apply problem-solving strategies and techniques, with these attempts tending to be impulsive, careless, hurried, and incomplete. AS measures another dysfunctional problem-solving dimension characterized by procrastination (putting off solving problems for as long as possible), passivity (waiting for problems to resolve themselves), and dependency (attempting to shift the responsibility for problem solving to others). The original 70-item SPSI was administered to the subjects in this study, which was scored for the five SPSI-R scales.

The SPSI-R has been found to have good psychometric properties. Coefficient alphas for the five scales (N = 1,053; D'Zurilla et al., 1997) are

.76 (PPO), .91 (NPO), .92 (RPS), .83 (ICS), and .88 **(AS).** Test–retest reliabilities (N = 138; 3 weeks apart) range from .72 (PPO) to .88 (NPO). Evidence supporting the convergent and discriminant validity of the SPSI-R scales has been reported in Chang and D'Zurilla (1996), D'Zurilla and Chang (1995), D'Zurilla and Maydeu-Olivares (1995), D'Zurilla et al. (1997), and Sadowski, Moore, and Kelley (1994). The primary measure in this study was an overall unweighted social problem-solving index (SPS) based on these five scales: SPS = PPO/5 + RPS/20 + (40 - NPO)/10 + (40 - ICS)/10 + (28 - AS)/7. To obtain this index, NPO, AS, and ICS were reversed-scored by substracting the actual scale scores from the highest possible score, and then each scale was divided by its number of items. Higher SPS scores indicate more constructive or facilitative problem solving, while lower *scores* indicate more defective or dysfunctional problem solving. The alpha estimate for the SPS (N = 1,053 college students) is .95, whereas the test–retest reliability estimate (N = 138 college students) is .93 (D'Zurilla et al., 1997).

Everyday Problems

The measure of everyday problems was the Problems Inventory (PI), which is a 52-item checklist of current problems that was developed for the present study. The PI was derived from two other self-report measures of daily problems—the Personal Problems Checklist (Schinka, 1984) and the Hassles Scale (Kanner et al., 1981). Several guidelines were employed in developing the PI. First, the instrument was designed to be relatively brief and particularly relevant for older and middle-aged individuals. Item selection was guided in part by descriptive data provided by Kanner et al. (1981) and Holahan et al. (1984) concerning problems most frequently endorsed by middle-aged and older adults. Second, the inventory was designed to focus on significant (for well-being), chronic, ongoing problems and avoid relatively minor, discrete annoyances and frustrations. Finally, in an attempt to avoid confounding the predictor variable (everyday problems) with the criterion measures (i.e., depression and anxiety), items that appeared to overlap with symptoms of either depression or anxiety were excluded. The success of this procedure was confirmed by having two independent raters (Ph.D.-level psychologists) judge whether any of the items on the scale could be considered symptoms of either a depressive or an anxiety disorder, based on *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.) (DSM-III-R; American Psychiatric Association, 1987) diagnostic criteria. Both raters indicated that they would not classify any of the items on the PI as a symptom of either of the disorders.

The final instrument consisted of a list of 52 potential problems in such areas as health, family and friends, the environment, work, and finances. Examples include "having chronic illness," "declining physical abilities," "having to spend savings," "friends or relatives too far away," "neighborhood deterioration," and "not having adequate retirement funds.'' Thirty-eight of the items were extracted from the Hassles Scale and 12 were taken from the Personal Problems Checklist. Two of the items (i.e., "concerns about your living arrangements" and "being dependent on others") were based on the suggestions of a pilot group of 10 elderly adults who were administered a 50-item version of the instrument and then asked to generate any additional problems that older individuals often experience. The instructions for the PI ask subjects to indicate which items they have experienced during the past two months. **A** measure of problem frequency was used rather than problem severity or intensity because previous research has suggested that a frequency count provides a relatively more objective measure of stress than intensity ratings (Reich, Parrella, & Filstcad, 1988). The PI score for the present study was the total number of items endorsed.

Depression

Depressive symptoms were measured with the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), which consists of 21 items representing a wide range of depressive symptoms. **A** meta-analysis of internal consistency estimates with a variety of samples yielded a mean coefficient alpha of .86 for psychiatric subjects and .81 for nonpsychiatric subjects (Beck, Steer, & Garbin, 1988). High convergent validities with respect to other measures of depression, including self-report instruments and clinical ratings, have been documented (Beck et al., 1988), and the BDI has been found to distinguish between major depression and generalized anxiety disorders (Steer, Beck, Riskind, & Brown, 1986). Within a sample of depressed elderly outpatients and nondepressed elderly community volunteers, Gallagher, Nies, and Thompson (1982) reported acceptable levels of internal consistency (coefficient alpha) and test–retest reliability for both depressed subjects (.73 and .79, respectively) and nondepressed subjects (.76 and .86, respectively).

Anxiety

Anxiety symptoms were assessed by means of the State-Trait Anxiety Inventory (STAI; Form Y; Spielberger, 1983), which consists of a 20-item Trait Anxiety (TA) scale and a 20-item State Anxiety (SA) scale. The TA scale measures how a person *generally* feels, whereas the SA scale measures how the person feels *at this moment.* We used the **TA** scale in this study because we believed that this measure would more adequately reflect the impact of chronic, ongoing problems over a period of 2 months. Internal consistency coefficients (coefficient alphas) for this scale range from .86 to .95 and test–retest reliability estimates range from .65 to .75 (up to 2 months) (Spielberger, 1983). Evidence supporting the concurrent and construct validity of both scales has been well documented in the literature (Spielberger, 1939). Moreover, excellent psychometric properties have been found when assessing anxiety in older adults (Spielberger, 1988).

Procedure

The subjects were informed that they would be participating in a study of how people think, feel, and behave when faced with problems in everyday living. The measures were administered to the subjects by the first author in their respective meeting places. A group testing format was employed with the groups ranging in size from 2 to 10 individuals. The measures were administered in the following order in all groups: (1) the background questionnaire, (2) the SPSI-R, (3) the PI, (4) the BDI, (5) the STAI, and (6) the Shipley Vocabulary subtest.

RESULTS

Separate multivariate analyses were performed to test the moderator hypothesis and the mediational hypothesis in the two age samples. In all stepwise procedures in these analyses, a more conservative alpha level was used, $a = .01$, instead of the customary $a = .05$ in order to protect against Type I errors. Initially, our analyses were performed on the unweighted overall social problem-solving index (SPS) described earlier. Follow-up analyses were then performed on the individual SPSI-R scales in order to determine which problem-solving dimensions were most responsible for the effects that were obtained for each hypothesis. Throughout these analyses, age was treated as a dichotomous variable: middle-aged versus elderly (coded as 1 and 0, respectively). Because PI, BDI, TA, **AS,** and NPO showed significant skewness and/or kurtosis within each sample, a square-root transformation was applied to these variables to eliminate this problem. All of the results reported below refer to these transformed variables. Table II presents the intercorrelations, means, and standard deviations for

Table II. Intercorrelations, Means, and Standard Deviations for the PI, SPS, BDI, and TA in the Elderly and Middle-Aged Samples[a]

	PI	SPS	BDI	TA
		Elderly sample		
PI	1.00			
SPS	−0.33	1.00		
BDI	0.61	−0.53	1.00	
TA	0.40	−0.63	0.69	1.00
M	2.61	12.83	2.42	5.83
SD	1.08	2.66	1.12	0.87
		Middle-aged sample		
PI	1.00			
SPS	−0.33	1.00		
BDI	0.62	−0.53	1.00	
TA	0.61	−0.63	0.73	1.00
M	2.71	14.34	2.03	5.89
SD	1.02	2.98	1.13	0.84

[a] N = 100 for each sample; PI = Problems Inventory; SPS = unweighted social problem solving index; BDI = Beck Depression Inventory; TA = Trait Anxiety; all correlations are significant, $p < .01$, except for the correlations between PI and SPS, $p < .05$.

PI, SPS, BDI, and TA in each sample.[3] All of the correlations in the table are significant and most of them are relatively high. The lowest correlations are between PI and SPS, $rs = -.33$ in both samples, $p < .01$. As expected, problem frequency is positively related to depression and anxiety, whereas problem-solving ability is inversely related to problem frequency, depression, and anxiety.

Test of the Moderator Hypothesis

We tested the moderator hypothesis in both samples simultaneously by fitting a single-group hierarchical multivariate multiple-regression model with BDI and TA as dependent variables and PI, SPS, and age (middle-aged vs. elderly) and their two-way interactions (PI × SPS, PI × Age, SPS × Age) as independent variables. LISREL 8 (Joreskog & Sorbom, 1993) was used to fit this model to the covariance matrix of these variables by

[3] In the elderly sample, the original untransformed means and standard deviations (m parentheses) for PI, BDI, and TA were 7.96 (6.05), 7.11 (6.19). and 34.77 (10.50), respectively. In the middle-aged sample, they were 8.37 (5.96), 5.40 (4.94). and 35.40 (10.29), respectively.

generalized least squares. The main effects of PI, SPS, and age were entered into the regression equation first, and then the interactions were tested using a stepwise procedure.

The results showed that all main effects (PI, SPS, and age) were significant, but none of the interactions was found to be significant after the main effects were accounted for. Hence, the hypothesis that problem solving is a moderator of the relation between problem frequency and depression or anxiety was not supported. Moreover, there were no moderator effects of age; that is, age did not interact significantly with either problem frequency or problem solving. The unstandardized and standardized regression weights corresponding to the main effects are presented in Table III. The results for PI and SPS indicate that problem frequency was related to higher levels of depression and anxiety in these samples, whereas problem-solving ability was related to lower levels of depression and anxiety. The results for age indicate that the middle-aged sample, compared to the elderly group, had lower scores on depression and higher scores on anxiety. This model fits the data very well: $\chi^2(6) = 6.41$, $p = .38$, root mean squared error of approximation (RMSEA; Steiger, 1990) = .019, standardized root mean squared residual (SRMSR; Joreskog & Sorbom, 1993) = ,0078, Goodness of Fit Index (GFI; Jöreskog & Sorbom, 1993) = .99. Problem frequency, problem-solving ability, and age accounted for 51% of the variance in both depression and anxiety. The path diagram for the resulting model is presented in Fig. 1.

Because social problem-solving ability was found to be significantly related to depression and anxiety in both samples, we were interested in determining what specific problem-solving dimensions were most responsible for these effects. Hence, we performed another multivariate multiple-regres-

Table III. Nonzero Regression Weights Obtained by Fitting the Moderator Model by Multivariate Multiple Regression using SPS as the Predictof[a]

	Predictor variables			
Criterion	PI	SPS	Age	R^2
BDI	0.53	−0.14	−0.23	.51
	(0.49)	(−0.37)	(−0.10)	
TA	0.27	−0.16	0.27	.51
	(0.34)	(−0.55)	(0.16)	

[a] N = 200; PI = Problems Inventory; SPS = unweighted social problem solving index; BDI = Beck Depression Inventory; TA = Trait Anxiety; all regression weights are significant, $p < .01$, except for the regression weights from age to BDI, for whichp < .05; the standardized regression weights are provided in parentheses.

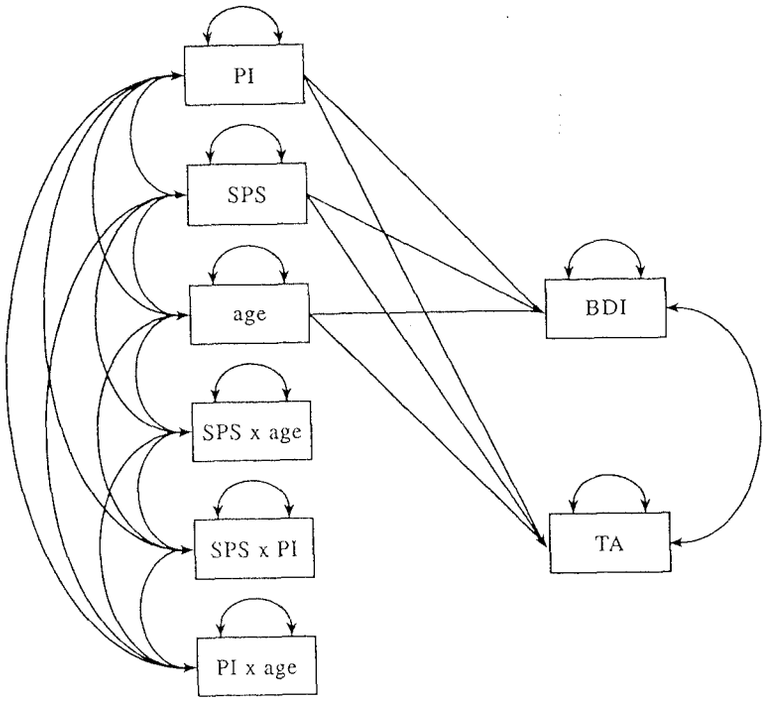

Fig. 1. Moderator model showing nonsignificant interactions.

sion analysis with BDI and TA as dependent variables and PI, the five SPSI-R scales, and age as independent variables. As before, LISREL 8 (Joreskog & Sörbom, 1993) was used to fit this model to the covariance matrix of these variables by generalized least squares. Table IV presents the intercorrelations, means, and standard deviations for PI, the SPSI-R scales, BDI, and TA in each sample.[4] As the table shows, all problem-solving dimensions except RPS were significantly correlated with depression and anxiety in both samples. RPS was found to be significantly related to both distress measures in the middle-aged sample but not in the elderly sample.

The multivariate multiple-regression model was fitted by setting all regression weights (the directed paths) equal to zero at the beginning of

[4]In the elderly sample, the original untransformed means and standard deviations (in parentheses) for NPO and AS were 12.06 (8.78) and 8.71 (5.17), respectively. In the middle-aged sample, they were 9.46 (7.02) and 6.30 (5.87). respectively (see footnote **3** for PI, BDI, and TA).

Table **IV.** Intercorrelations, Means, and Standard Deviations for the PI, SPSI-R Scales, BDI, and TA in the Elderly and Middle-Aged Samples'

	PI	PPO	NPO	RPS	ICS	AS	BDI	TA
				Elderly sample				
PI	1.00							
PPO	−0.18'	1.00						
NPO	0.40	−0.50	1.00					
RPS	0.04*	0.60	−0.13*	1.00				
ICS	0.28	−0.19*	0.44	−0.42	1.00			
AS	0.27	−0.42	0.66	−0.18*	0.53	1.00		
BDI	0.61	−0.39	0.56	−0.16*	0.32	0.38	1.00	
TA	0.40	−0.42	0.68	−0.15'	0.43	0.50	0.69	1.00
M	2.61	11.64	3.16	41.82	11.43	2.80	2.42	5.83
SD	1.08	3.62	1.44	13.98	6.34	0.94	1.12	0.87
				Middle-aged sample				
11	1.00							
PPO	−0.23	1.00						
NPO	0.49	−0.62	1.00					
RPS	−0.12'	0.68	−0.43	1.00				
ICS	0.23	−0.48	0.49	-0.64	1.00			
AS	0.28	−0.63	0.53	−0.52	0.66	1.00		
BDI	0.62	−0.46	0.59	−0.32	0.33	0.39	1.00	
TA	0.61	−0.61	0.75	−0.36	0.33	0.46	0.73	1.00
M	2.71	13.53	2.84	47.90	9.11	2.18	2.03	5.89
SD	1.02	3.85	1.19	15.07	6.00	1.26	1.13	0.84

[a]N = 100 for each sample; PI = Problems Inventory; PPO = Positive Problem Orientation; NPO = Negative Problem Orientation; RPS = Rational Problem Solving; ICS = Impulsivity/Carelessness Style; AS = Avoidance Style; BDI = Beck Depression Inventory; TA = Trail Anxiety; all correlations are significant, $p < .01$, except those marked by an asterisk, for which $p > .05$.

the analysis and using a stepwise procedure to free those regression weights that were significant at $\alpha = .01$. No interaction terms were included in this model because no significant interactions had been found in the previous analysis. Only the direct paths from PI, NPO, and age were found to be significant. Hence, the relations between social problem solving and depression and anxiety were primarily accounted for by negative problem orientation in both samples. The nonzero regression weights for this model are presented in Table V. The fit of this model was satisfactory: $\chi^2(8) = 17.50, p = 0.025$, RMSEA = .079 @-value for the test of close fit, RMSEA < .05, $p = .15$), SRMSR = .040, GFI = .98. As Table V shows, problem frequency, negative problem orientation, and age

Table V. Non-Zero Regression Weights Obtained by Fitting the Moderator Model by Multivariate Multiple Regression using NPO as the Predictor[a]

Criterion	Predictor variables			
	PI	NPO	Age	R^2
BDI	0.49 (0.46)	0.31 (0.37)	−0.34 (0.15)	.53
TA	0.19 (0.25)	0.39 (0.62)	0.16 (0.10)	.58

[a] N = 200; PI = Problems Inventory; NPO = Negative Problem Orientation scale; BDI = Beck Depression Inventory; TA = Trait Anxiety; all regression weights are significant, $p < .01$, except for the regression weights from age to BDI, for which $p < .05$; the standardized regression weights are provided in parentheses.

accounted for 53% of the variance in depression and 58% of the variance in anxiety.

Age Differences in Problem Types

Two potentially important age differences were reported above: (a) The elderly group had higher scores on depression and lower scores on anxiety than the middle-aged group (see Table III), and (b) the dimension of rational problem solving was significantly related to both depression and anxiety in the middle-aged group but not in the elderly group (see Table IV). In an attempt to shed some light on the possible reasons for these differences, we examined the types of everyday problems that were reported by the two age groups on the PI. Ten judges rated each specific problem endorsed by the subjects for its relevance to two general problem domains that were considered to be particularly important for well-being: (a) physical health and (b) interpersonal conflict. The judges included one advanced graduate student in clinical psychology and nine Ph.D.-level psychologists. Each problem was rated on a 5-point scale (0 to 4) ranging from *item does not address this area at all* to *item addresses this area extremely well.* **An** item was classified as a health problem or an interpersonal problem if it received a mean rating of at least 2 for that domain. Not unexpectedly, the older subjects endorsed significantly more health problems, $t(198) = 4.02$, $p < .001$, whereas the middle-aged sample endorsed significantly more interpersonal problems, $t(198) = 3.35$, $p < .01$. The implications of this difference in problem types will be discussed later.

Test of the Mediational Hypothesis

The mediational model illustrated in Fig. 2 was tested using LISREL 8 (Jöreskog & Sdrbom, 1993) by (a) fitting the model by maximum likelihood to the means and covariances presented in Table II as a two-sample path model with constrained means and covariances, (b) fitting the comparison model, also depicted in Fig. 2, in which the covariance structure

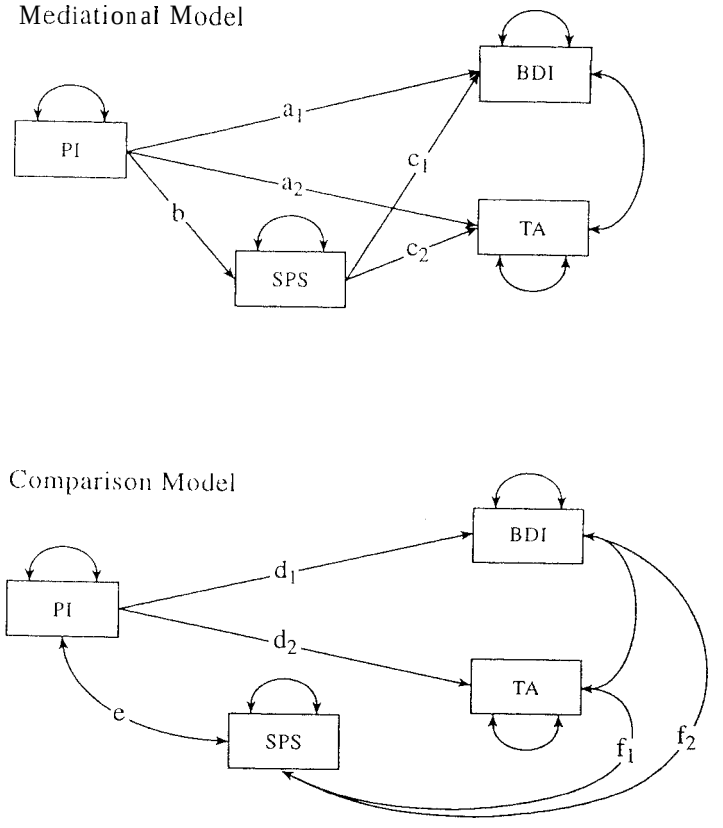

Fig. 2. Mediational model and comparison model.

Table VI. Directed Paths and Intercepts Obtained by Fitting the Mediational Model Using SPS as the Mediator Variable'

	Middle-aged sample	Elderly sample
Path		
a_1* PI –> BDI	0 53 [0.50] (0 06)	0.53 [0.50] (0.06)
a_2* PI –> TA	0.27 [0.33] (0.04)	0.27 [0.33] (0.04)
b* PI –> SPS	–0.66 [–0.33] (0.18)	–0.88 [–0.33] (0.18)
c_1* SPS –> BDI	–0.14 [–0.361 (0.02)	–0.14 [–0.36] (0.02)
c_2* SPS –> TA	–0.16 [–0.52] (0.02)	–0.16 [–0.52] (0.02)
Intercepts		
BDI	2.00 (0.09)	2.46 (0.09)
TA'	5.86 (0.06)	5.86 (0.06)
PI*	2.66 (0.07)	2.66 (0.07)
SPS	14.40 (0.25)	12.77 (0.25)

[a] N = 100 for each sample; SPS = unweighted social problem solving index; PI = Problems Inventory; BDI = Beck Depression Inventory; TA = Trait Anxiety; the estimated standard errors are in parentheses; the within group standardized path coefficients are in squared brackets; those coefficients marked by an asterisk are constrained to be equal across samples.

corresponding to SPS was left unconstrained (i.e., the directed paths 6, c_1, and c_2 in Fig. 1 were substituted by nondirected paths e and f_1, and f_2), and (c) reestimating the mediational model fixing the directed paths a to the values estimated in *d*. We would conclude that a mediating effect exists if the following conditions hold: First, all the mediating paths (b, c_1, c_2) are significant; and second, the direct paths between the exogenous variable (PI) and the outcome variables (BDI and TA) are significantly lower when the mediator (SPS) is introduced in the model—that is, when $a_1 < d_1$ and $a_2 < d_2$ (Baron & Kenny, 1986).

We fitted the mediational model to the means and covariances of both samples simultaneously, forcing all parameters to be equal across samples, including the directed paths a_1, a_2, b, c_1, and c_2; the nondirected paths; and the intercepts (i.e., mean structures) for PI, SPS, BDI, and TA. These equality constraints across samples were then relaxed by freeing the directed paths and intercepts significantly different across samples using a stepwise procedure, keeping the residual variances of the variables as well as the residual covariance between BDI and TA equal across samples. The restricted paths and intercepts of the resulting model are prcsentcd in Table VI. The resulting model had equal restricted and unrestricted paths across samples, and different intercepts for SPS and BDI. This model fits the data rather well, despite its restrictiveness: $\chi^2(12) = 11.38, p = .50$, SRMSR = .050, GFI = .97. The estimated values for the directed paths a_1 and a_2

Table VII. Directed Paths and Intercepts obtained by Fitting the Mediational Model using NPO as the Mediator Variable"

	Middle-aged sample	Elderly sample
Path		
a_1* PI –> BDI	0.49 [0.46] (0.06)	0.49 [0.46] (0.06)
a_2* PI –> TA	0.19 [0.24] (0.04)	0.19 [0.24] (0.04)
b* PI –> NPO	0.56 [0.44] (0.08)	0.56 [0.44] (0.08)
c_1* NPO –> BDI	0.31 [0.37] (0.05)	0.31 [0.37] (0.05)
c_2* NPO –> TA	0.39 [0.60] (0.03)	0.39 [0.60] (0.03)
Intercepts		
BDI	2.00 (0.09)	2.46 (0.09)
TA*	5.86 (0.06)	5.86 (0.06)
PI*	2.66 (0.07)	2.66 (0.07)
NPO	2.80 (0.11)	3.19 (0.11)

[a] N = 100 for each sample; PI = Problems Inventory; NPO = Negative Problem Orientation; BDI = Beck Depression Inventory; TA = Trait Anxiety; the estimated standard errors are in parentheses; the within group standardized path coefficients are in squared brackets; those coefficients marked by an asterisk are constrained to be equal across samples.

according *to* the mediator model are .53 and .27, respectively (within group standardized values = $\S$ 0 and .33, respectively).

Next, we estimated the comparison model, in which the directed paths (b, c_1, c_2) were turned into nondirected paths. This model is equivalent to the mediational model and hence yields the same goodness-of-fit indices. The estimated values for the directed paths d_1 and d_2 are .66 and .41, respectively (within group standardized values = .62 and .50, respectively). Finally, we reestimated the mediational model fixing the a_1 and a_2 directed paths to those values estimated by the comparison model (d_1 and d_2). This model yielded $\chi^2(14) = 22.06$, $p = .077$. **A** formal test of whether the directed effects of PI on BDI and TA decreased by the mediating effect of SPS (from .66 and .41 to .53 and .27) was obtained by performing a nested chi-square test, which was found to be significant, $\chi^2_{dif}(2) = 10.16$, $p = .004$, indicating that there was a significant mediating effect of SPS on BDI and TA. Specifically, social problem solving accounted for 19.7% (1-.53/.66) of the relation bctwecn problems and depression, and 34.1% (1-.27/.41) of the relation between problems and anxiety. Overall, this mediational model accounted for 50% of the variance in depression and 50% of the variance in anxiety within each age group.

Because mediating effects of SPS on BDI and TA were found, our next analysis attempted to determine which specific problem-solving dimensions were most responsible for these effects. We tested the same mediational model depicted in Fig. 2, but in place of the overall SPS index all five SPSI-R scales were tested simultaneously. We estimated the directed paths a_1 and a_2 and all nondirected paths. All directed paths *b* and c were fixed at zero. Then, in a stepwise manner we freed all *b* and c directed paths significant at an $\alpha = .01$. In both samples, only the *b* and *c* coefficients for NPO were significant at this level. Hence, when all SPSI-R dimensions were included in the analysis, only NPO satisfied the first condition to be a mediator variable. Next, in order to determine whether NPO also satisfied the second condition for mediation, we used the same procedure that was used with SPS, only with NPO in place of SPS. 'The restricted paths and intercepts of the model with NPO as mediator are presented in Table VII. As can be seen, the best mediational model with NPO had the same structure as the best mediational model with SPS, namely, only the intercepts for BDI and NPO were significantly different across samples. This model also fits these data satisfactorily, $\chi^2(12) = 16.62$, $p = .16$, SRMSR = .070, GFI = .95. As Table VII shows, the estimated values for the a_1 and a_2 directed paths according to the mediational model were .49 and .19, respectively (within group standardized values = .46 and .24, respectively). The estimated values for these directed paths according to the comparison model were the same as in the mediational model with

SPS, .66 and .41. **A** formal test of the equality of these two sets of coefficients showed that there was a significant mediating effect of NPO on BDI and TA: $\chi^2_{dif}(2) = 23.51$, $p < .001$. More specifically, negative problem orientation accounted for 19.7% of the relation between problems and depression, and 53.7% of the relation between problems and anxiety. Note that all directed path coefficients in Table VII are positive, which indicates that a greater number of everyday problems was associated with a more nepstive problem orientation, which in turn was related *to* higher levels of depression and anxiety within each age group. This overall mediational model accounted for 49% of the variance in depression and 54% of the variance in anxiety within each age group.

DISCUSSION

The results of this study clearly show that previous findings regarding significant relations between social problem-solving deficits and depression and anxiety in young adult populations (see Haaga et al., 1995; Nezu & D'Zurilla, 1989) can be extended *to* older community-dwelling adults, including both middle-aged and elderly individuals. In addition, support was found in both age samples for a mediational model which assumes that social problem solving is an intervening variable that accounts to a significant extent for the causal relations between between everyday problems and psychological distress. These findings are consistent with the path-analytic results of an earlier study by Nezu and Ronan (1985) which used a college student sample.

Although all five problem-solving dimensions measured by the SPSI-R were found *to* be significantly related to both depression and anxiety in at least one of the two samples, additional follow-up analyses indicated that negative problem orientation contributed most to the significant mediating effect. Negative problem orientation has been defined as a dysfunctional cognitive-emotional *"set"* or orientation toward problems in living which involves the general tendencies to (a) appraise a problem as a threat, (b) doubt one's own problem-solving capabilities, (c) expect negative problem-solving outcomes, and (d) exhibit a low tolerance for frustration when confronted with a problem (Chang & D'Zurilla, 1996b; Maydeu-Olivares & D'Zurilla, 1996). Based on the results of this study, including the intercorrelations among the SPSI-R measures (see Table IV), our interpretation of the mediational model, in Fig. 2 is that a greater number of unresolved problems results in a more negative problem orientation, which leads to more dysfunctional and less constructive problem solving, which in turn results in higher levels of psychological distress (D'Zurilla, 1986; Nezu &

D'Zurilla, 1989). Moreover, because a negative problem orientation means that everyday problems have a threatening and pessimistic psychological significance for the person, this dimension is expected to have an immediate direct effect on psychological well-being in addition to its indirect effect via problem solving proper (i.e., the use of problem-solving techniques).

Although this particular mediational model was found to fit our data, it should be noted that because of the cross-sectional design of this study alternative causal interpretations cannot be ruled out. For example, an alternative mediational model that reversed the positions of PI and SPS in Fig. 2 would be empirically equivalent to our model and would yield the same fit to our data. Moreover, this alternative model could also be interpreted meaningfully within social problem-solving theory: More dysfunctional and less constructive problem solving results in more unresolved problems, which in turn result in higher levels of psychological distress. Hence, if one adopts a reciprocal causation model (Bandura, 1986, 1989) which assumes that a two-directional relationship exists between everyday problems and social problem solving, it can be concluded that both mediational models have validity. This reciprocal causation model would be represented by inserting a two-headed arrow between PI and SPS in Fig. 2. Unfortunately, this model was not identified and, therefore cannot be estimated. In order to identify the model, additional variables would have to be included in the cross-sectional study (for a discussion of identification issues, see Bollen, 1989). However, the best recommendation for sorting out these different causal possibilities is to conduct longitudinal studies that obtain repeated measures of everyday problems, problem-solving processes, and psychological distress over time.

Because the present results highlight the potentially important role of negative problem orientation in adaptation and well-being, it is noteworthy that Chang and D'Zurilla (1996b) recently investigated the convergent and discriminant validity of the Negative Problem Orientation scale of the SPSI-R by examining its relations with the constructs of pessimism (defined as generalized negative outcome expectancies) and negative trait affectivity. Consistent with expectations based on social problem-solving theory, negative problem orientation was found to share a significant amount of variance with pessimism and negative trait affectivity (35% and 38%, respectively), but not enough to be considered redundant with either one of these constructs. In support of this assertion, negative problem orientation was found to contribute significant incremental validity to the prediction of general psychological symptomatology, even after controlling for pessimism and negative trait affectivity. Hence, negative problem orientation is a unique, mutifaceted construct that is more than just a reflection of pessimism and negative affectivity. Other important aspects of negative

problem orientation that may contribute significantly to psychological distress and symptomatology include perceived threat to well-being (i.e., harm or loss), negative problem-solving self-efficacy (i.e., serious doubts about one's own problem-solving capabilities), and low frustration tolerance (i.e., belief that difficult problems cannot be tolerated). Empirical support for this view can be found in Folkman, Lazarus, Gruen, and Delongis (1986), Bandura (1989), Chang and D'Zurilla (1996a), and Lazarus and Folkman (1984).

The present findings provide further support for the importance of distinguishing between problem orientation and problem-solving skills in social problem-solving assessment and research (D'Zurilla & Nezu, 1990; Nezu & D'Zurilla, 1989; Nezu & Perri, 1989). In "normal" or unselected populations, problem orientation appears to be more important for psychological well-being than problem-solving skills. In addition to the present results, this general conclusion is based on the findings of other studies focusing on depression and anxiety (Haaga et al., 1995), psychological stress (D'Zurilla & Sheedy, 1991), worrying (Dugas, Letarte, Rhéaume, Freeston, & Ladouceur, 1995), and suicidal ideation (Clum & Febbraro, 1995). More research is now needed that explores this issue in different clinical samples. It is possible that problem-solving skills deficits may be an important factor in the development of clinical disorders, or in determining the severity of psychopathology. The results of several recent studies are consistent with this view (Linehan, Camper, Chiles, Strosahl, & Shearin, 1987; Marx, Williams, & Claridge, 1992; Sadowski & Kelley, 1993; Sadowski et al., 1994; Schotte, & Clum, 1987).

In closing, although the major mediational findings of this study are virtually identical in the two age samples, several age differences were found that warrant some brief discussion: (a) The elderly group was more depressed and less anxious than the middle-aged group; (b) rational problem solving (i.e., the deliberate, systematic use of effective problem-solving skills) was significantly related to depression and anxiety in the middle-aged sample but not in the elderly sample; and (c) the elderly subjects reported more health problems, whereas the middle-aged subjects reported more interpersonal conflicts. Because many of the health problems of older individuals are likely to be chronic and largely unchangeable, possibly resulting in a sense of helplessness, this difference in problem types might be related to the differences in levels of depression versus anxiety between the two age groups. For the same reason, rational problem-solving skills might be less important for psychological well-being in an elderly population than in middle-aged individuals. Alternatively, however, the potential utility of problem-solving skills for finding emotion-focused solutions (e.g., positive re-appraisal, social support, catharsis) to unchangeable or uncon-

trollable problematic situations might be unrecognized by many older people (D'Zurilla, 1986; Nezu & D'Zurilla, 1989). This issue might be an important focus in problem-solving training programs with the elderly.

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