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ORIGINAL ARTICLE

Social Problem Solving as a Mediator of the Link Between Stress and Psychological Well-being in Middle-Adulthood

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Abstract This study had two major objectives: (1) to examine the relationship between stress, social problem solving, and psychological well-being (PWB) in a sample of middle-aged adults (*M* 46.3 years) and (2) to examine the role of social problem solving as a potential mediator of the link between stress and PWB in this group. Correlational analyses indicated that both stress and social problem solving were significantly involved in PWB. Moreover, results from conducting a path analysis indicated that social problem solving partially mediated the link between stress and PWB. Although stress and negative problem orientation were found to be unique predictors of different dimensions of PWB, other social problem-solving dimensions also emerged as important predictors. Some implications of these findings for enhancing positive psychological functioning in middle-aged adults are discussed.

Keywords Social problem solving · Stress · Psychological well-being · Middle-aged adults

Introduction

Since the publication of D'Zurilla and Goldfried's (1971) landmark paper on real-life or social problem solving more than three decades ago, researchers have become greatly interested in understanding variations in the form and function of adult problem solving

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as it occurs in the real world. Unfortunately, despite the growing and wide-spread interest in social problem-solving (SPS) research and training (Chang et al. 2004b), studies on adult social problem solving have been limited by their dependence on a narrow data base of young adult samples, namely, college students, and a focus on adjustment-based largely on negative psychological conditions.

Studying Problem Solving Ability in Middle-Aged Adults

Although the notion of midlife crises among middle-aged adults has been criticized and found to be without strong or compelling support (e.g., Baruch 1984; McCrae and Costa Jr 1984), middle adulthood remains a challenging and stressful period in adult development (Helson and Soto 2005; Lachman 2001). For some middle-aged parents, middle adulthood represents a time when they see their children leave home. For other middle-aged adults, this represents a time when they find themselves taking on a greater role as caregiver to their aging parents (Zal 1992). In addition to these major developmental transitions, middle-aged adults, unlike young adults, must also negotiate increasing concerns about career goals, ageism, health issues, body image, and multiple financial responsibilities (Helson and Soto 2005; Saucier 2004; Stewart and Ostrove 1998; Wrosch et al. 2000). Given the wide range of stressful problems experienced by middle-aged adults, compared to young adults, it would seem important to understand the problem-solving abilities of middle-aged adults. Indeed, past studies have identified problem-solving ability as an important mediator of the link between stress and negative psychological functioning in adults (Kant et al. 1997; Wei et al. 2003).

Real-World Problem Solving in Adults: Performance- and Process-Based Approaches

In general, studies of real-world problem solving have taken one of two approaches (Thornton and Dumke 2005). The first approach, and perhaps the most popular in studies of middle-aged adults (e.g., Berg et al. 1999; Heidrich and Denney 1994), has involved studies examining the extent to which adults are able to solve problems across a number of specific situations. This *performance-based approach* emphasizes the quality and quantity of the solutions generated by individuals when confronted with specific problems. For example, in one study, Denney and Pearce (1989) examined the practical problem-solving abilities of a sample of adults between 20 and 80 by examining the number of safe and effective solutions provided by their participants to ten distinct and common problems encountered by the elderly. However, there are at least two potential shortcomings of using this approach. First, a performance-based approach fails to consider the impact of other factors that may determine or account for the solutions generated by individuals (Thornton and Dumke 2005). For example, a number of studies have shown that the emotional salience of a given problem can prompt adults to consider engaging in different types of coping responses (e.g., Blanchard-Fields et al. 1995, 1997). Relatedly, some studies of adults have shown that current depressed mood may greatly impair the ability to produce effective solutions to problems (Lyubomirsky et al. 1999). Second, although this approach to the study of problem solving has been useful in identifying variations in performance levels of problem-solving abilities across

different adult age groups (Denney 1990; Thornton and Dumke 2005), it has not been very useful in determining the extent to which problem-solving abilities are directly related to variations in personal adjustment.

Given these concerns, a number of researchers have focused on a *process-based approach* involving the use of models and measures that are believed to directly represent the ongoing and underlying structures involved in real-world problem solving. One popular process model and measure is the one developed by D'Zurilla and his colleagues (D'Zurilla et al. 2004a; D'Zurilla and Nezu 1990, 1999; D'Zurilla et al. 2002, 2004b). According to these researchers, *social problem solving*, as measured by the Social Problem Solving Inventory-Revised (SPSI-R; D'Zurilla et al. 2002), refers to problem solving as it occurs in the real world, and is defined as the self-generated cognitive–affective–behavioral process by which a person attempts to discover effective ways of coping with problematic situations encountered in everyday living. Social problem solving represents a higher-order construct that can be broken down into five distinguishable problem-solving dimensions (Maydeu-Olivares and D'Zurilla 1995). Among the five dimensions, positive problem orientation (PPO) and rational problem solving (RPS) are believed to reflect constructive or adaptive processes, whereas negative problem orientation (NPO), avoidance style (AS), and impulsivity/carelessness style (ICS) are believed to reflect dysfunctional or maladaptive processes (D'Zurilla and Chang 1995; D'Zurilla et al. 2002). Unfortunately, compared to performance-based studies, only a handful of studies have examined SPS processes in middle-aged adults (Thornton and Dumke 2005).

Positive Psychological Functioning in Middle-Aged Adults: Ryff's Multidimensional Model of Psychological Well-Being

Unlike findings from performance-based studies of adult problem solving, findings from process-based studies using measures like the SPSI-R have shown a reliable association between social problem solving and a wide range of maladaptive conditions, including depressive symptoms, anxiety, and suicide ideation (Nezu et al. 2004b). As a result, these findings have been instrumental in the subsequent development of problem-solving therapies and training programs that seek to strategically impact the problem-solving process in order to reduce or prevent negative psychological functioning in adults (e.g., D'Zurilla and Nezu 1999; Nezu et al. 1989; Vuchinich 1999). Yet, because the nonpresence of negative functioning should not be equated with the presence of positive functioning (e.g., Ruini et al. 2003), the absence of research examining the link between social problem solving and positive psychological functioning represents a major omission in the empirical literature. That is, although researchers have done well in the past to focus their concerns on critical issues related to treating illness, they have done so at the expense of neglecting issues related to fostering a life well-lived (Seligman and Csikszentmihalyi 2000; Sheldon and King 2001; McCullough and Snyder 2000).

According to Ryff (1989), one of the major reasons that research on psychological well-being (PWB) has lagged behind research on psychological dysfunction is the lack of theoretically meaningful measures that covered the diverse definitions of PWB represented in the psychological literature. For example, although measures of life satisfaction have commonly been used to assess for PWB over the past 20 years, Ryff and Keyes (1995) have argued that most conceptualizations of life satisfaction fail to provide a theory-based formulation of well-being (i.e., ''What does it mean to be well

psychologically?''). Drawing from points of convergence across diverse conceptualizations of positive psychological functioning, Ryff (1989, 1995) formulated a multidimensional model of PWB, as measured by the Scales of Psychological Well-Being (SPWB), composed of six theoretically distinguishable functions, involving self-acceptance (SA), positive-relations with others, autonomy, environmental mastery (EM), purpose in life (PL), and personal growth (PG). Although growing efforts by researchers to identify important dimensions of positive functioning in adults continue (Lopez and Snyder 2003), Ryff's (1989) model and measure of PWB remain one of the most studied and comprehensive in the adult-lifespan literature (Keyes and Magyar-Moe 2003).

Past studies have shown that levels in positive PWB vary between young and middle-aged adults. For example, Ryff and Keyes (1995) found that middle-aged adults, compared to young adults, reported greater autonomy, and less PG. Nonetheless, little is known about factors that may contribute to the different dimensions of positive psychological functioning. First, as noted earlier, middle adulthood is believed by some to represents a particularly stressful period of development when adults are increasingly forced to take on multiple roles and responsibilities. Indeed, findings from studies involving middle-aged adults have shown stress to be linked to greater negative psychological functioning (e.g., Pot et al. 2005; Stephens et al. 1994). Unfortunately, little is known about the link between stress and positive psychological functioning in middle-aged adults. For example, the negative associations that may exist between stress and different dimensions of PWB are likely to vary. Second, although studies have linked (poor) social problem solving to variations in negative psychological functioning in middle-aged adults, it is not clear if and how social problem solving is linked to variations in positive psychological functioning in this group. To date, only one study has examined the link between social problem solving and PWB. In a preliminary study of young adults, Chang et al. (2004a) found that several of the SPSI-R scales had moderate associations with scores on the SPWB. However, given that levels of PWB vary between young and middle-aged adults and given developmental differences in the quantity and quality of challenges experienced by these two adult groups (Ryff 1989, 1995), there is no reason to expect social problem solving to show the same pattern of involvement in PWB in middle-aged adults as has been found in young adults. For example, Ryff (1989) found significantly higher scores on EM and autonomy in middle-aged adults, compared to young adults. Thus, among middle-aged adults, one might expect social problem solving to have stronger associations with these two dimensions of PWB over other dimensions. Furthermore, because social problem solving has been found to be an important mediator of the link between stress and negative functioning in a previous study of middle-aged adults (Kant et al. 1997; see also, Chang 2002), it is possible that social problem solving may mediate a link between stress and PWB in middle-aged adults. Specifically, because stress has been found to decrease problem solving (Lyubomirsky et al. 1999), and problem solving is typically associated with generating greater positive or desired outcomes, one might expect that while stress may be generally associated with lesser PWB, it is the potential impact of stress on social problem solving that may play a more immediate role than stress experiences itself in determining PWB.

Purpose of the Present Research

Given these considerations, the goals of the present study were to (a) examine the relations between social problem solving, stress, and PWB in a sample of middle-aged

adults; and (b) determine if social problem solving represents an important mediator of the link between stress and PWB in this group.

As a useful coping style for adults, we hypothesized that social problem solving, as measured by the SPSI-R, would be significantly associated with PWB in middle-aged adults. Specifically, we predicted that the two constructive dimensions of SPS ability (viz., PPO and RPS) would be significantly and *positively* related to each of the six dimensions of PWB measured by the SPWB, whereas the three dysfunctional dimensions (viz., NPO, AS, and ICS) would be significantly and *negatively* related to each dimension of well-being. Based on past findings indicating that adult positive and NPOs, especially the latter, have strong associations with adjustment (Kant et al. 1997), we expected these two SPS dimensions would have the strongest unique associations with PWB. In addition, we expected stress to be negatively associated with each of the different dimensions of PWB. Lastly, because past findings have pointed to how stress may lower social problem solving (Lyubomirsky et al. 1999), we predicted that social problem solving would mediate the association between stress and PWB in middle-aged adults (see Fig. 1).

Methods

Participants

To obtain a sample of middle-aged adults (adults between the ages of 30 and 64; see Ryff and Keyes 1995) for the present study, 214 parents (51 men and 163 women) of students from a mid-sized mid-western university were solicited to participate in this study. Students were enrolled in an introductory psychology course and fulfilled a course requirement by participating in a separate study in which each student participant was also asked to help solicit a parent participant for the present study. Ages across this initial parent sample ranged from 35 to 73, with a mean of 48.4 years. A majority of these participants were White (92.5%).

Measures

Social Problem-Solving Inventory-Revised (SPSI-R; D'Zurilla et al. 2002)

The SPSI-R is a 52-item multidimensional measure of SPS ability derived from factor-analytic studies (D'Zurilla and Maydeu-Olivares 1995; Maydeu-Olivares and D'Zurilla 1995, 1996) of the original theory-driven SPS Inventory (D'Zurilla and Nezu 1990). It consists of five major scales that measure five different, albeit related, problem-solving

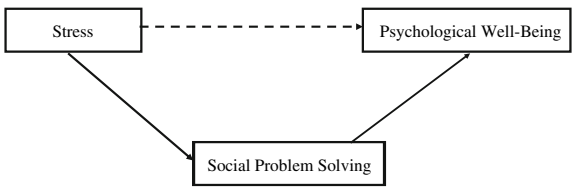

Fig. 1 Hypothesized model of social problem solving as a mediator of the link between stress and psychological well-being

dimensions. Respondents are asked to rate items on a five-point Likert-type scale ranging from 0 (*not at all true of me*) to 4 (*extremely true of me*). The PPO scale taps a constructive problem-solving cognitive set (e.g., ''When I have a problem, I usually believe that there is a solution for it''). The NPO scale measures a dysfunctional or inhibitive cognitive-emotional set (e.g., ''I usually feel threatened and afraid when I have an important problem to solve''). The RPS scale assesses the knowledge and use of constructive or effective problem-solving skills (e.g., ''When I have a problem to solve, one of the first things I do is get as many facts about the problem as possible''). The ICS scale taps a dysfunctional problem-solving pattern characterized by ineffective or inadequate attempts to apply problem-solving skills (e.g., ''When I am attempting to solve a problem, I usually go with the first good idea that comes to mind''). The AS scale assesses another defective problem-solving pattern characterized by procrastination, passivity or inaction, and dependency (e.g., ''I usually go out of my way to avoid having to deal with problems in my life'').

The SPSI-R has been found to have good reliability and validity (D'Zurilla et al. 2002). In college students, coefficient alphas for the five scales range from 0.95 (RPS) to 0.76 (PPO), with test–retest reliabilities ranging from 0.88 (NPO) to 0.72 (PPO).

Perceived Stress Scale (PSS; Cohen et al. 1983)

The PSS is a 14-item measure of self-appraised life stress in the past month (e.g., ''In the last month, how often have you been upset because of something that happened unexpectedly?''). We selected the PSS to assess for stress over life events or hassles surveys because the PSS does not constrain respondents to a specific list or number of stressors. Respondents are asked to rate the frequency of these items across a five-point Likert-type scale ranging from 0 (*never*) to 4 (*very often*). Higher scores reflect greater perceived stress in the last month. Evidence for construct validity of the PSS with life events measures has been reported in Cohen et al. (1983). Test–retest reliability (6 weeks) for the PSS has been reported to be 0.55 (Cohen et al. 1983).

Scales of Psychological Well-Being (SPWB; Ryff 1989)

The SPWB assesses for six theoretically distinct dimensions of PWB, namely, SA, positive relations with others (PRO), autonomy, EM, and PL. A separate 20-item scale assesses each dimension of PWB. To save time, shorter 14-item scales based on the original 20-items scales were used (Kwan et al. 2003). Ryff and Essex (1992) reported that the correlations between the shortened scales with the parent scales ranged from 0.97 to 0.98 (p. 509). The SA scale is a 14-item instrument that assesses the extent to which an individual holds a positive attitude toward the self (e.g., ''In general, I feel confident and positive about myself''). The PRO scale is a 14-item instrument that assesses the extent to which an individual has warm, satisfying, trusting relations with others (e.g., ''People would describe me as a giving person, willing to share my time with others''). The Autonomy (A) scale is a 14-item instrument that assesses the extent to which an individual is self-determining and independent (e.g., ''My decisions are not usually influenced by what everyone else is doing''). The EM scale is a 14-item instrument that assesses the extent to which an individual has a sense of mastery or competence in managing the environment (e.g., ''In general, I feel I am in charge of the situation in which I live''). The PL scale is a 14-item instrument that assesses the extent to which an individual has goals in life and a sense of directedness (e.g., ''I have a sense

of direction and PL''). Lastly, the PG scale is a 14-item instrument that assesses the extent to which an individual has a feeling of continued growth and development (e.g., ''For me, life has been a continuous process of learning, changing, and growth''). Respondents are asked to rate their agreement to statements based on a six-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Higher scores on each of the scales reflect greater levels of PWB. Test–retest reliabilities over a 6-week period for the longer SPWB scales have been found to range from 0.81 to 0.88. (Ryff 1989). The SPWB scales have been found to demonstrate good construct validity with other well-being measures in young adults, middle-aged adults, and older adults (Ryff 1989; see also, Ryff and Keyes 1995).

Procedure

All study measures were given to parents in envelopes by students who participated in a different study (examination of cognitive bias in future predictions) in the form of a take home survey. Of the initial 214 parents who participated, the responses provided by 12 much older participants were dropped given our focus on middle-aged adults in the present study. In addition, nine failed to complete all study measures, and thus their responses were subsequently dropped from the study. This left a total of 193 middle-aged participants for the present study whose responses were used in subsequent analyses, ages ranged from 38 to 59 (M 46.3 years of age). Participants were not made aware of the purpose of the study until after they had completed all measures. To protect the participants' anonymity, only participant numbers were placed on the instruments. Responses on the measures were returned in sealed envelopes. In addition, all student and parent participants signed separate consent forms that indicated that all test data would be kept strictly confidential.

Results

Prior to conducting our main analyses, we tested for gender differences. The result of conducting a MANOVA between men (n = 47) and women (n = 146) on the present set of measures failed to indicate significant gender differences, Wilk's Lambda (12, 180) = 0.96, ns. Therefore, and because we were interested in looking at results that were generalizable to both men and women, all subsequent analyses are based on combining the responses obtained by both groups.

Relations Between Social Problem Solving, Stress, and PWB

To examine the relations between social problem solving, perceived stress, and PWB, we computed zero-order correlations between all of the study measures. Results of these computations, as well as computing for means, standard deviations, and internal consistencies, are presented in Table 1. As this table shows, the majority of the significant intercorrelations between scores on the five SPSI-R scales were in the medium to large effect size range ($r \geq 0.30$). Moreover, these correlations were in the expected direction. For example, scores on PPO and RPS were found to be positively correlated with each other (r = 0.61), but scores on PPO and NPO were found to be negatively correlated with each other (r = –0.42). Likewise, scores on the five SPSI-R scales were found to be significantly correlated, and in the expected direction,

Table 1 Zero-order correlations, means, SD, and internal reliabilities for all study measures

Measures	1	2	3	4	5	6	7	8	9	10	11	12
1. PSS	–											
2. PPO	**–0.40**	–										
3. NPO	**0.55**	**–0.42**	–									
4. RPS	**–0.19**	**0.61**	**–0.21**	–								
5. ICS	0.14	–0.18	**0.55**	**–0.32**	–							
6. AS	0.12	**–0.27**	**0.64**	**–0.20**	**0.58**	–						
7. SA	**–0.62**	**0.46**	**–0.61**	**0.24**	**–0.20**	**–0.34**	–					
8. PRO	**–0.34**	**0.38**	**–0.44**	**0.29**	**–0.33**	**–0.32**	**0.74**	–				
9. A	**–0.44**	**0.38**	**–0.59**	0.17	**–0.23**	**–0.48**	**0.71**	**0.61**	–			
10. EM	**–0.56**	**0.36**	**–0.60**	**0.22**	**–0.27**	**–0.40**	**0.83**	**0.73**	**0.75**	–		
11. PL	**–0.44**	**0.39**	**–0.57**	**0.30**	**–0.29**	**–0.42**	**0.88**	**0.78**	**0.72**	**0.85**	–	
12. PG	**–0.30**	**0.32**	**–0.51**	**0.24**	**–0.37**	**–0.43**	**0.66**	**0.73**	**0.68**	**0.67**	**0.76**	–
M	22.50	14.18	15.24	51.65	16.27	9.88	62.89	65.37	62.39	60.12	64.99	63.65
SD	7.43	2.65	6.29	9.96	4.91	4.59	12.65	10.58	11.78	10.10	11.09	9.85
α	0.88	0.84	0.88	0.91	0.85	0.84	0.89	0.91	0.91	0.90	0.89	0.88

$n = 193$. Measures 2 through 6 are from the social problem-solving inventory-revised. Measures 7 through 12 are from the scales of psychological well-being

PPO positive problem orientation, *NPO* negative problem orientation, *RPS* rational problem solving, *ICS* impulsivity/carelessness style, *AS* avoidance style, *PSS* perceived stress scale, *SA* self-acceptance, *PRO* positive relations with others, *A* autonomy, *EM* environmental mastery, *PL* purpose in life, *PG* personal growth

Correlations in bold are significant at $p < 0.01$

with PSS scores and with scores on the six SPWB scales. For example, scores on PPO were found to be negatively correlated with PSS scores ($r = –0.40$), but positively correlated with each of the six SPWB scales (range rs = 0.32 to 0.46). However, PSS scores were not found to be significantly associated with scores on ICS and AS. As expected, PSS scores were found to have significant negative associations in the small to medium effect size range with scores on each of the six SPWB scales (range rs = –0.30 to –0.62). Finally, it is worth noting that the significant intercorrelations between scores on the six SPWB scales were in the large effect size range ($r \geq 0.50$). In sum, these findings indicate that both stress and social problem solving have important associations with PWB in middle-aged adults.

Does Social Problem Solving Mediate the Link Between Stress and Psychological Well-Being?

To test our hypothesized mediation model, we examined whether overall social problem solving would mediate the relationship between stress and overall PWB. In order to address this question, we calculated a global SPS score across the five SPSI-R scales using the formula provided by D'Zurilla et al. (2002): (PPO/5) + (RPS/20) + (40 – NPO)/10 + (40 - ICS)/10 + (28 - AS)/7. Essentially, this formula provides a standardized total score based on adding the standardized scores obtained from the PPO and RPS scales, and the standardized (reversed) scores from the NPO, ICS, and AS scales. Past studies have shown that overall SPS scores provide a useful index of global social problem solving (e.g., Chang 2002; D'Zurilla et al. 2003; Kant et al. 1997). We also obtained a global PWB score by simply summing scores across the six SPWB scales. The bivariate correlations between these measures of social problem solving, stress, and PWB were all significant, thus, satisfying the first three conditions for mediation (Baron

and Kenny 1986): (1) the independent variable must be related to the hypothesized mediator, (2) the independent variable must be related to the dependent variable, and (3) the mediator must be related to the dependent variable. Specifically, PSS scores were predictive of SPS scores ($\beta = -0.39$, $p < 0.001$), PSS scores were predictive of PWB scores ($\beta = -0.52$, $p < 0.001$), and SPS scores were predictive of PWB scores ($\beta = 0.59$, $p < 0.001$). Accordingly, we conducted a path analysis looking at the role of global social problem solving as a potential mediator of stress and global PWB. The results of this analysis are presented in Fig. 2.

The inclusion of social problem solving in the model significantly reduced the path between stress and PWB ($\Delta\beta = 0.25$; Sobel's $Z = -4.52$, $p < 0.001$), indicating a significant mediation effect. However, because the path remained highly significant even after controlling for social problem solving ($\beta = -0.34$, $p < 0.001$), these results indicate partial rather than complete mediation. Using Cohen's (1977) convention for small ($f^2 = 0.02$), medium ($f^2 = 0.15$), and large effects ($f^2 = 0.35$), the path model involving stress and global social problem solving accounted for a large 44.9% ($f^2 = 0.81$) of the variance in global PWB, $F(2, 190) = 77.54$, $p < 0.001$.

Because the use of global SPS and PWB scores may have masked important relationships between specific SPS and PWB dimensions, we ran an additional series of analyses in which stress and the five dimensions of social problem solving were entered as predictors of each of the six dimensions of PWB. Results of these regression analyses are presented in Table 2. For predicting SA, stress ($\beta = -0.38$), NPO ($\beta = -0.34$), and ICS ($\beta = 0.15$) were found to be significant predictors within the predictor set. For predicting PRO, only PPO ($\beta = 0.19$) was found to be a significant predictor within the predictor set. For predicting autonomy, stress ($\beta = -0.21$), NPO ($\beta = -0.32$), ICS ($\beta = 0.18$), and AS ($\beta = -0.32$) were found to be significant predictors within the predictor set. For predicting EM, stress ($\beta = -0.37$), NPO ($\beta = -0.30$), and AS ($\beta = -0.19$) were found to be significant predictors within the predictor set. In predicting PL, stress ($\beta = 0.21$), NPO ($\beta = -0.32$), and AS ($\beta = -0.21$) were found to be significant predictors within the predictor set. Lastly, in predicting PG, only NPO ($\beta = -0.28$) as found to be a significant predictor within the predictor set. In sum, both differences and similarities were found across predictors of the different dimensions of PWB.

Discussion

The present study sought to examine the relations between stress, social problem solving, and PWB in middle-aged adults. First, consistent with expectations, stress was found to be significantly associated with less PWB in middle-aged adults. Likewise,

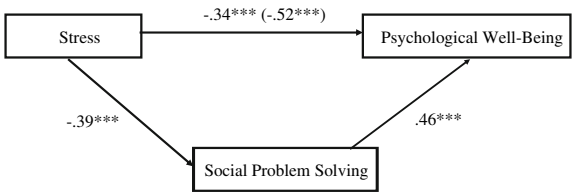

Fig. 2 Results of path analyses delineating paths in which global social problem solving is taken to serve as a potential mediator of the link between stress and global psychological well-being ($n = 193$). Number within the parentheses reflects the original path prior to controlling for global social problem solving. All *numbers* represent standardized beta weights. ***$p < 0.001$.

Table 2 Results of multiple regression analyses showing stress and social problem solving dimensions as predictors of dimensions of psychological well-being

Scales of psychological well-being	β	r	r^2	F
Self-acceptance		0.73	0.53	35.45***
PSS	–0.38***			
PPO	0.15*			
NPO	–0.34***			
RPS	0.02			
ICS	0.15*			
AS	–0.09			
Positive relations with others		0.52	0.27	11.45***
PSS	–0.13			
PPO	0.19*			
NPO	–0.14			
RPS	0.06			
ICS	–0.13			
AS	–0.07			
Autonomy		0.66	0.44	24.21***
PSS	–0.21**			
PPO	0.12			
NPO	–0.32***			
RPS	–0.02			
ICS	0.18*			
AS	–0.32***			
Environmental mastery		0.68	0.46	26.35***
PSS	–0.37***			
PPO	0.01			
NPO	–0.30**			
RPS	0.07			
ICS	0.08			
AS	–0.19*			
Purpose in life		0.63	0.40	20.37***
PSS	–0.21**			
PPO	0.04			
NPO	–0.32**			
RPS	0.16*			
ICS	0.09			
AS	–0.21*			
Personal growth		0.55	0.30	13.59***
PSS	–0.07			
PPO	0.08			
NPO	–0.28**			
RPS	0.06			
ICS	–0.08			
AS	–0.15			

$n = 193$

PPO positive problem orientation, *NPO* negative problem orientation, *RPS* rational problem solving, *ICS* impulsivity/carelessness style, *AS* avoidance style, *PSS* perceived stress scale

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

social problem solving was also found to be significantly associated with PWB. Specifically, the two constructive problem-solving dimensions (PPO and RPS) were found to be *positively* related to PWB, whereas the three dysfunctional dimensions (NPO, ICS, and AS) were found to be *negatively* related to well-being. Accordingly, the

present findings add important empirical support for the generalizability of the function of adult social problem solving in PWB among middle-aged adults.

Beyond these noted correlational patterns, two additional patterns are worth discussing. First, despite past findings indicating that middle-aged adults, compared to young adults, report greater autonomy and EM (Ryff 1989), the present findings indicate that the importance of different social problem solving dimensions in PWB is similar between these two different adult age groups. Second, it is interesting to note that in the present study, positive and NPO were found to have among the strongest associations with SA. RPS was found to have the strongest association with PL. ICS was found to have the strongest association with PG, and AS was found to have the strongest association with autonomy. These associations are similar to those found in a study of young adults, with two notable exceptions. Chang et al. (2004a) found that ICS was most strongly associated with PL, and AS was most strongly associated with EM in young adults. Because PL and PG levels have been found to be lower in middle-aged adults than in young adults, it may be that ICS represents an important correlate of those dimensions of PWB that typically decline over time. Similarly, AS may represent an important correlate of those dimensions of PWB that typically rise over time. Taken together, these findings suggest that there may be subtle, but important variations in how specific social problem solving dimensions relate to different dimensions of PWB across young and middle adulthood.

We also found some support for our hypothesized mediation model. At the global level, we found that the path between stress and global PWB was partially mediated by global social problem solving. As discussed earlier, past studies have indicated that stressful experiences may lead to greater negative functioning by decreasing problem solving ability (e.g., Lyubomirsky et al. 1999). In that regard, our findings indicate that PWB in middle-aged adults may be strongly influenced by both the direct impact stress has on global PWB, and by the indirect impact of stress on global social problem solving. With regard to the latter finding, although there may be a number of different explanations for why stress attenuates SPS abilities in middle-aged adults, one possibility is that the type of stress more often experienced in this population than in younger populations (e.g., stress associated with a managing chronic illness; Sidell 1997) may over time demand the use of more cognitive, affective, and behavioral resources than available to effectively maintain adaptive levels of SPS abilities. In turn, this pattern may result in a vicious cycle that results in decreased PWB and increased psychological distress in this group. At the very least, our findings point to a clear need to not only better understand why stress attenuates SPS abilities in middle-aged adults, but to also work on ways to reduce stress and strengthen SPS abilities in this group when facing stressful situations (D'Zurilla and Nezu 1999). Furthermore, because global social problem solving did not fully mediate the link between stress and global PWB, it may be that other mediators are involved. Therefore, future research should examine other potential mediators such as optimism and hope which have also been linked to stress in adults (Chang 2001c) and found to be important predictors of adjustment in middle-aged adults (e.g., Chang 2003; Chang and Sanna 2001).

When we examined stress and specific SPS dimensions as predictors of different dimensions of PWB in middle-aged adults, a number of interesting patterns emerged. First, consistent with our finding from the global mediation test, the magnitude of the path between stress and the six different dimensions of PWB dropped when entered with the social problem solving dimensions. In fact, stress was not found to be a significant unique predictor of PRO and of PG, whereas some of the SPS dimensions

were (e.g., PPO). Accordingly, depending on the specific dimensions of PWB examined, it appears that stress may strongly operate through specific SPS dimensions in middle-aged adults.

Second, it is worth noting that NPO was found to be a significant unique predictor of all but one dimension of PWB. Specifically, NPO was not found to be a unique predictor of PRO. As discussed earlier, past findings have indicated a strong link between NPO and negative psychological functioning in middle-aged adults (Kant et al. 1997). Taken together, these findings indicate that NPO is strongly involved in both positive and negative psychological functioning in middle-aged adults. However, beyond the apparent prominence of NPO in psychological adjustment (Robichaud and Dugas 2004), it is also worth noting that despite the moderate associations among the SPS dimensions, other dimensions of social problem solving beyond NPO emerged as significant unique predictors of PWB in the present study. Among the constructive social-problem solving dimensions, PPO was found to be a significant predictor of SA and PRO, and RPS was found to be a significant predictor of PL. Among the remaining dysfunctional problem-solving dimensions, ICS was found to be a significant predictor of SA and autonomy, and AS was found to be a significant predictor of autonomy, EM, and PL. For the most part, however, the strength of these predictors was relatively weak compared to findings for NPO. The one exception to this pattern was the finding of a strong role for (lack of) AS in predicting autonomy. On the one hand, our findings partly replicate those obtained in past studies pointing to the robust involvement of NPO in psychological adjustment. Although it is not exactly clear why this specific dimension of social problem solving seems so crucial to psychological functioning, some have pointed to the conceptual and empirical overlap between NPO and another robust predictor of psychological functioning, namely, pessimism (Chang and D'Zurilla 1996). Given their common emphasis on negative thinking, it may be that for many, psychological functioning is more strongly predicated on the presence or power of non-negative thinking, than the presence of positive thinking (Kendall 1984; cf., Chang 1996, 2001b). On the other hand, our findings also underscore a need to consider other components of the SPS model, which may prove in some cases to be as strong or stronger a predictor of psychological functioning than NPO. In that regard, it is interesting to note that in the present sample of middle-aged adults, AS and NPO had the same strong unique negative association in predicting autonomy. In contrast, in a study of young adults (Chang et al. 2004a), NPO, but not AS, was found to have a unique negative association in predicting autonomy. This suggests that while nonavoidance of problems does not have much bearing on perceptions of autonomy among young adults, it does among middle-aged adults. Taken together, the present findings indicate that although NPO represents an important predictor of PWB in middle-aged adults, other social problem solving dimensions can and should not be ignored.

Third, some might wonder why the predictor set of stress and social problem solving did not account for the largest amount of variance in PRO. Indeed, the predictor set was found to account for the least amount of the variance in predicting PRO (27%) than in any other dimension of PWB. In our view, because social problem solving involves the process of solving real-world problems, not just interpersonal problems, we did not have any reason to expect that social problem solving would have a strong and distinct association with PRO. Accordingly, our findings are theoretically consistent with the notion that social problem solving involves a process that is not limited to just interpersonal problem-solving activities in adults (D'Zurilla et al. 2002).

The results of this study can have important implications for clinical and preventive interventions that are aimed at enhancing positive psychological functioning in middle-aged adults. Specifically, the present results suggest that such interventions should include the dual goals of increasing SPS ability and reducing stress. Hence, a multicomponent intervention should be used that includes problem-solving training (D'Zurilla and Nezu 1999; Nezu et al. 1989) as well as other effective stress management and prevention methods (e.g., relaxation training, stress inoculation training; Meichenbaum 1993). The present findings suggest that the problem-solving training component should focus on all five dimensions of SPS ability, with the goals of increasing PPO and RPS (i.e., effective problem-solving skills), while reducing NPO, ICS, and AS. Although problem-solving training and stress management methods have been found in numerous studies to reduce *negative* psychological and behavioral functioning (see reviews by Nezu 2004; Nezu et al. 2004a), more research is needed to evaluate such interventions for their efficacy in promoting and maximizing positive psychological and behavioral functioning in middle-aged adults.

Limitations of the Present Study

In closing, a number of limitations of the present study should be noted. First, because of the cross-sectional, correlational design, caution is needed when interpreting the suggested causal relationships. Although these causal relationships are consistent with our hypothesized model and past research, the present design does not permit definite conclusions about the direction of these relationships. Thus, it is also possible that PWB may influence social problem solving and stress, rather than vice versa, and/or that the relationships among these variables are reciprocal in nature (e.g., stress may impact and/or be impacted by social problem solving; Chang et al. 2007). Accordingly, future prospective and longitudinal studies are needed that examine these possibilities. Second, and relatedly, given that the present findings were based on self-reports, it would be important in future studies to replicate the present findings using alternative methods of assessment (e.g., peer/spousal ratings).

Third, the present sample of middle-aged adults was drawn from a select population of middle-aged parents who had children attending college. Given that most of these parents in the present sample were likely to have been college-educated, the present findings may be less generalizable to middle-aged adults who do not have children, did not go to college, or both (e.g., Markus et al. 2004). Relatedly, although our definition of middle-aged adults was in part based on past approaches (e.g., Ryff and Keyes 1995), some might argue that our approach to include adults ranging from 38 to 59 years of age was too broad. In that regard, it would interesting in futures studies to determine if the role of stress and social problem solving on PWB varies significantly at different points along this continuum. Fourth, although we did not find significant gender differences on social problem solving, this is not to say that important gender differences might not have emerged in looking at the associations involving stress, social problem solving, and PWB in middle-aged adults. Given this possibility, it would be important in future studies to examine these relations across comparable samples of men and women, and across different age groups, from young adults to older adults, to further examine the generalizability of the present set of findings across the entire adult lifespan. Finally, given that cultural and racial variations have been observed on adult social problem solving (e.g., Chang 1998, 2001a; Chang and Banks 2007; Chang et al. 2006), it would be

important to examine the generalizability of the present findings across middle-aged adults of different cultural and racial backgrounds.

Concluding Comment

As mentioned earlier, process-based approaches to the study of social problem solving have been largely limited to examining young adults (i.e., college students). In the present study, we sought to examine the importance of social problem solving in the PWB of middle-aged adults. In general, our findings indicated that social problem solving was not only involved in the PWB of this group, but that it also served to partially mediate the path between stress and PWB. Given these findings, it is clear that more studies involving middle-aged (and older) adults are needed to expand on the present findings and to test the function of social problem solving against other important conditions and outcomes salient to this group (e.g., multiple roles, career goals, ageism, and health problems).

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