

SELF-ESTEEM AND SOCIAL PROBLEM SOLVING AS PREDICTORS OF AGGRESSION IN COLLEGE STUDENTS

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This study examined the relations between self-esteem, social problem-solving ability, and aggression in a sample of 205 college students. The Social Problem-Solving Inventory-Revised was used to measure five different dimensions of social problem-solving ability (viz., positive problem orientation, negative problem orientation, rational problem solving, impulsivity/carelessness style, & avoidance style) and the Aggression Questionnaire was used to measure four different dimensions of aggression (viz., physical aggression, verbal aggression, anger, & hostility). Self-esteem and social problem-solving ability were measured at the same time, whereas aggression was measured six to seven weeks later. Low self-esteem was found to be related to anger and hostility, and several specific problem-solving dimensions were found to be related to anger, hostility, and physical aggression. A series of path analyses found support for a mediational model in which the link between self-esteem and anger is fully mediated by negative problem orientation. In addition, the results also suggested that negative problem orientation partially mediates the relationship between self-esteem and hostility. The theoretical, research, and clinical implications of the findings are discussed.

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In recent decades, violence and aggression have become serious and growing problems in this country and around the world (Tulloch, 1997; Van Hasselt & Hersen, 2000; Wodarski & Wodarski, 1998). In addition to the usual street crimes involving violence and aggression (e.g., assault, homicide), this problem behavior has been increasing in other settings as well, including the home (i.e., domestic violence), the school, the workplace, the highways ("road rage"), the airways ("air rage"), and even sporting events (e.g., "sports parenting rage"). While it is understood that interventions are needed to reduce and prevent aggressive and violent tendencies in these settings, the causes and contributing factors are less clear at the present time.

Some research has linked aggression to personality (e.g., Buss & Perry, 1992). One important personality trait appears to be self-esteem (Buss & Perry, 1992; Baumeister, Smart, & Boden, 1997). In this context, the concept of self-esteem refers to global feelings of self-worth held by an individual (Bednar, Wells, & Peterson, 1989; Rosenberg, 1965). Unfortunately, the research on this topic has produced conflicting findings. Some studies have found that low self-esteem is associated with aggressive tendencies (e.g., Buss & Perry, 1992; Green & Murray, 1973), whereas other studies have suggested a link between high self-esteem and aggression (Baumeister et al., 1997). Adding to the confusion, some recent studies have failed to find any significant relation between self-esteem and aggression (e.g., Bushman & Baumeister, 1998; Baumeister, Bushman, & Campbell, 2000).

Some of the inconsistent findings in this area may reflect a problem in distinguishing between high self-esteem and narcissism (Bushman & Baumeister, 1998). In addition, they may also reflect differences in the conceptualization and measurement of aggression. While most investigators have conceptualized aggression only in physical terms (e.g., violence), some research has suggested that aggression is best viewed as a multidimensional concept (Buss & Durkee, 1957). According to Buss and Perry (1992), aggression is composed of four distinct dimensions, namely, physical aggression, verbal aggression, anger, and hostility. These four dimensions are captured by their empirically derived Aggression Questionnaire (AQ; Buss & Perry, 1992; Harris, 1997). The dimensions of physical and verbal aggression, which involve hurting or harming others, represent the instrumental or motor components of aggression. Anger, which involves physiological arousal and preparation for instrumental aggression, represents the affective component of aggression. Hostility consists of feelings of resentment and suspicion and represents the cognitive component of aggression. Using their multidimensional measure, Buss and Perry (1992) have reported significant negative correlations between self-esteem and the dimensions of anger

and hostility, which support the view that low self-esteem is linked to aggressive dispositions. In view of the inconsistent research findings on this issue, however, it is important to replicate these results in a new sample.

Another dispositional variable that has been found to be related to both self-esteem and aggression is social problem-solving ability. The term social problem solving refers to problem solving as it occurs in the real world (D'Zurilla & Nezu, 1982). It has been defined as the self-directed cognitive-behavioral process by which a person attempts to discover effective or adaptive ways of coping with problematic situations encountered in the course of everyday living (D'Zurilla & Nezu, 1999). Clinical assessment with aggressive clients suggests that their aggressive or violent behavior can often be understood as a maladaptive or self-defeating attempt to solve a problem, which implies that defective or dysfunctional problem solving may increase the likelihood of aggression. In support of this view, a number of empirical studies have found a significant relationship between social problem-solving deficits and aggression in children and adolescents (e.g., Lochman & Dodge, 1994; Lochman & Lampron, 1986; Lochman, Wayland, & White, 1993; Loeber & Dishion, 1985). The present study attempted to extend these findings to a population of young adults, using the multidimensional measure of aggression described above.

Most of the studies with children and adolescents used problem-solving performance measures that provide only global indicators of social problem-solving ability (e.g., the quality of solutions to hypothetical problems). According to the results of factor-analytic studies by Maydeu-Olivares and D'Zurilla (1995, 1996), social problem-solving ability is not a unitary construct, but rather, a multi-dimensional construct consisting of five different, albeit related, problem-solving dimensions, namely, positive problem orientation, negative problem orientation, rational problem solving (i.e., knowledge and use of effective problem-solving skills), impulsivity/carelessness style, and avoidance style. The present study assessed these different dimensions of social problem-solving ability in order to determine which strengths or weaknesses might be related to the different aggressive dispositions identified by Buss and Perry (1992). These findings could have important clinical implications for treatment and preventive interventions focusing on aggression and violence.

Although social problem-solving ability and self-esteem have been found to be significantly related (D'Zurilla, Nezu, & Maydeu-Olivares, 2002; McCabe, Blankstein, & Mills, 1999), research has not yet examined how these two correlated variables are linked to aggression. One possibility, suggested by social problem solving theory and research, is that

social problem solving mediates the relationship between self-esteem and aggression. Another possibility, suggested by the research on self-esteem and aggression, is that self-esteem is a mediator between social problem solving and aggression. A third possibility is that self-esteem and social problem solving are independent or unique predictors of aggression. Hence, the present study was also designed to examine this issue.

According to Baron and Kenny (1986; see also, Holmbeck, 1997), four conditions must be met to establish mediation. First, the predictor (e.g., social problem solving) must be significantly related to the hypothesized mediator (e.g., self-esteem). Second, the predictor (e.g., social problem solving) must be shown to be significantly related to the dependent variable (e.g., anger). Third, the mediator (e.g., self-esteem) must be found to be significantly related to the dependent variable. The fourth and final condition for mediation is that the relationship between the predictor (e.g., social problem solving) and the dependent variable (e.g., anger) must become nonsignificant after controlling for the mediator (e.g., self-esteem).

Based on these considerations, the present study had five major hypotheses: (1) self-esteem and social problem-solving ability will be significantly correlated; (2) self-esteem will be significantly related to subsequent aggression; (3) social problem-solving ability will be significantly related to subsequent aggression; (4) when self-esteem is taken as a mediator, social problem-solving ability will continue to be a significant predictor of subsequent aggression; and (5) when social problem-solving ability is taken as a mediator, self-esteem will no longer be a significant predictor of subsequent aggression, thus, providing support for a mediational model in which social problem solving mediates the relationship between self-esteem and aggression. Based on the evidence to date, we could not predict whether the results for all or only some of the problem-solving and aggression dimensions would support these hypotheses.

METHOD

PARTICIPANTS

Two hundred and seventeen college students (145 women and 72 men) were recruited from the subject pool at a large northeastern public university. All participants were enrolled in the introductory course in psychology and participated in the study in order to fulfill a course requirement. The age range was 16 to 29 years, with a mean age of 18.9 years ($SD = 2.18$ years). Participants identified themselves as Caucasian

American (38.5%), Asian American (33.7%), African American (18.1%), Latin American (8.3%), or Other. Men and women were not found to differ significantly in age. Moreover, there was no significant difference in age based on ethnicity.

MEASURES

Self-Esteem Scale (SES; Rosenberg, 1965). The SES is a ten-item measure of global self-esteem (e.g., "I feel that I'm a person of worth, at least on an equal basis with others"). The original SES used a four-point response scale (strongly disagree, disagree, agree, strongly agree). For the present study, we modified this format to a five-point scale to allow for a "neutral" category between "disagree" and "agree." The SES has been found to have good reliability. For example, in two different studies the coefficient α s were found to be .92 (Burns & D'Zurilla, 1999) and .89 (Roberts & Kassel, 1997). In the present sample, the α was found to be .88. Lower scores on the SES have been found to be related to different forms of psychological and behavioral maladjustment, such as depression (Chang, 2001; Rice, Ashby, & Slaney, 1998), interpersonal sensitivity (Boyce & Parker, 1989; McCabe et al., 1999), and eating disorders (Shisslak, Pazda, & Crago, 1990).

Social Problem-Solving Inventory-Revised (SPSI-R; D'Zurilla et al., 2002). The SPSI-R is a 52-item, multi-dimensional measure of social problem-solving ability derived from factor-analytic studies (Maydeu-Olivares & D'Zurilla, 1995, 1996) of the original theory-driven Social Problem-Solving Inventory (D'Zurilla & Nezu, 1990). It consists of five major scales that measure five different, albeit related, problem-solving 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 Positive Problem Orientation (PPO) scale taps a constructive problem-solving cognitive set. Individuals who score high on this scale are more likely to (a) appraise a problem as a "challenge" (i.e., opportunity for benefit or gain) rather than a threat, (b) believe that problems are solvable, (c) believe in one's own personal ability to solve problems successfully, (d) believe that successful problem solving takes time, effort, and persistence, and (e) commit themselves to solving problems with dispatch rather than avoiding them. The Negative Problem Orientation (NPO) scale measures a dysfunctional or inhibitive cognitive-emotional set. Individuals with higher scores on this scale are more likely to (a) view a problem as a significant threat to well-being, (b) doubt one's own personal ability to solve problems successfully, and (c) easily become frustrated and upset when confronted with problems in living. The Rational Problem Solving (RPS) scale assesses the knowl-

edge and use of constructive or effective problem-solving skills. Higher scores on this scale indicate individuals who carefully and systematically gather facts and information about a problem, identify demands and obstacles, set a realistic problem-solving goal, generate a variety of different alternative solutions, anticipate the possible consequences, systematically compare and judge the alternatives, and then choose and implement a solution while carefully monitoring and evaluating the outcome. The Impulsivity/Carelessness Style (ICS) scale taps a dysfunctional problem-solving pattern characterized by ineffective or inadequate attempts to apply problem-solving skills. Higher scores on this scale indicate individuals who consider few solution alternatives, often impulsively going with the first idea to come to mind; scan alternatives and consequences quickly and carelessly; and monitor and evaluate solution outcomes carelessly and inadequately. The Avoidance Style (AS) scale assesses another defective problem-solving pattern characterized by procrastination, passivity or inaction, and dependency. Individuals with higher scores on this scale are more likely to avoid problems rather than confronting them immediately, put off solving problems for as long as possible, wait for problems to resolve themselves, and attempt to shift the responsibility for solving his or her problems to others.

The SPSP-R has been found to have good reliability and validity (D'Zurilla et al., 2002). In college students, coefficient α s for the five scales range from .95 (RPS) to .76 (PPO). In the present sample, the α s range from .88 (NPO and AS) to .82 (PPO). Test-retest reliabilities in college students range from .88 (NPO) to .72 (PPO). The SPSP-R has been found to be related to different forms of psychological and behavioral maladjustment, including anxiety, hopelessness, depression, suicidality, maladaptive coping, and risk-taking behavior (see reviews in D'Zurilla & Nezu, 1999; D'Zurilla et al., 2002).

Aggression Questionnaire (AQ; Buss & Perry, 1992). The AQ is a 29-item, multi-dimensional measure of aggression. It consists of four empirically-derived scales that measure four different kinds of aggressive experiences. The Physical Aggression (AQ-Physical) scale assesses physical instrumental aggression (e.g., "I get into fights a little more than the average person"). The Verbal Aggression (AQ-Verbal) scale measures verbal instrumental aggression (e.g., "I can't help getting into arguments when people disagree with me"). The Anger (AQ-Anger) scale taps expressions of anger, which is the affective or emotional component of aggression (e.g., "Sometimes I fly off the handle for no good reason"). The Hostility (AQ-Hostility) scale assesses expressions of hostility, which is the cognitive component of aggression (e.g., "I wonder why sometimes I feel so bitter about things"). Respondents are asked to rate items on a 5-point Likert-type scale ranging

from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*).

The AQ has been found to have good reliability and validity (Buss & Perry, 1992). Test-retest reliabilities (nine weeks) for the four scales range from .72 (AQ-Anger and AQ-Hostility) to .80 (AQ-Physical). In the present sample, coefficient α s range from .86 (AQ-Hostility) to .90 (AQ-Anger). With regard to validity, the AQ has been found to be related to other theoretically relevant traits, such as emotionality, impulsiveness, and competitiveness. Scale scores have also been found to correlate with peer nominations of the various types of aggression (Buss & Perry, 1992).

PROCEDURE

All study measures were administered in small groups (30 participants or less). At Time 1, all 217 participants completed the SES and the SPSI-R. At Time 2, six to seven weeks later, 205 of these participants completed the AQ. Of the initial participants, 12 failed to either return for the Time 2 testing or provide complete responses on the AQ. Accordingly, all analyses are based on responses provided by the 205 participants who completed measures at both times.

RESULTS

RELATIONS BETWEEN SELF-ESTEEM, SOCIAL PROBLEM SOLVING, AND AGGRESSION

The zero-order correlations among the study variables and their means, standard deviations, and coefficient α s are presented in Table 1. Because of the number of statistical comparisons between the measures of self-esteem, social problem solving, and aggression in this table, $p < .01$ was used to determine statistical significance instead of the customary $p < .05$. As the table shows, all measures have good internal reliability. As predicted, self-esteem was found to be significantly related to social problem-solving ability. Specifically, self-esteem was found to be correlated with all problem-solving dimensions except rational problem solving. As expected, the correlation with positive problem orientation is positive, whereas the correlations with negative problem orientation, impulsivity/carelessness style, and avoidance style are all negative.

As expected, self-esteem and social problem-solving ability, measured at Time 1, were both found to be significantly related to aggression at Time 2. Specifically, self-esteem is negatively related to anger and hostility. All five problem-solving dimensions are related to hostility. In ad-

TABLE 1. Correlations and Internal Reliabilities for All Study Measures

Measures ^a	1	2	3	4	5	6	7	8	9	10
1. SES	—									
2. PPO	.27**	—								
3. NPO	-.36**	-.39**	—							
4. RPS	.08	.54**	-.11	—						
5. ICS	-.20**	-.14	.56**	-.23**	—					
6. AS	-.23**	-.28**	.65**	-.14	.57**	—				
7. AQ-Physical	.01	.04	.09	-.15	.27**	.07	—			
8. AQ-Verbal	-.03	.14	-.03	.03	.03	-.12	.58**	—		
9. AQ-Anger	-.20*	-.12	.38**	-.11	.26**	.21*	.67**	.63**	—	
10. AQ-Hostility	-.32**	-.23**	.53**	-.22**	.38**	.36**	.52**	.41**	.63**	—
M	27.56	13.38	16.00	47.56	12.92	8.63	19.25	13.42	16.18	16.49
SD	6.91	3.82	8.53	13.27	7.34	5.84	6.60	3.82	5.32	5.78
α	.88	.82	.88	.85	.86	.88	.87	.88	.90	.86

Notes. N = 205. SES = Rosenberg Self-Esteem Scale; PPO = Positive Problem Orientation; NPO = Negative Problem Orientation; RPS = Rational Problem Solving; ICS = Impulsivity/Carelessness Style; AS = Avoidance Style; AQ-Physical = Aggression Questionnaire - Physical Aggression Scale; AQ-Verbal = Aggression Questionnaire - Verbal Aggression Scale; AQ-Anger = Aggression Questionnaire - Anger Scale; AQ-Hostility = Aggression Questionnaire - Hostility Scale. ^aMeasures 1 through 6 assessed at Time 1. Measures 7 and 10 assessed at Time 2 (six to seven weeks later). * $p < .05$; ** $p < .001$.

dition, the three dysfunctional problem-solving dimensions are also related to anger and one of these dimensions, impulsivity/carelessness style, is also related to physical aggression. As expected, the correlations associated with the two constructive dimensions are all negative, whereas those associated with the three dysfunctional dimensions are all positive.

EXAMINING THE POTENTIAL ROLE OF SELF-ESTEEM AS A MEDIATOR OF THE LINK BETWEEN SOCIAL PROBLEM SOLVING AND AGGRESSION

Before looking at specific problem-solving and aggression dimensions, we first examined whether self-esteem would mediate the relationship between the more general constructs of social problem solving and aggression. In order to address this question, we calculated a general social problem-solving score across the five SPSP-R scales using the formula provided by D'Zurilla et al. (2002): $(PPO/5) + (RPS/20) + (40 - NPO)/10 + (40 - ICS)/10 + (28 - AS)/7$. We obtained a general aggression score by simply summing scores across the four AQ subscales. The bivariate correlations between social problem solving, self-esteem, and aggression were all significant, thus, satisfying the first three conditions for mediation: (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, the correlations between social problem solving and self-esteem and aggression were $.32, p < .001$ and $-.29, p < .001$, respectively, and the correlation between self-esteem and aggression was $-.17, p < .05$. Accordingly, we conducted a path analysis looking at the role of self-esteem as a potential mediator of general social problem solving and general aggression. The results of this analysis are presented in Figure 1. As the figure shows, although the inclusion of self-esteem in the model slightly reduced the path between social problem solving and aggression, it still remained highly significant ($p < .001$). It is also noteworthy that the path between self-esteem and aggression was no longer significant. Thus, the results of this analysis failed to support the view that self-esteem is a mediator.

Nonetheless, because the use of general social problem-solving and aggression scores may have masked important relationships involving the specific problem-solving and aggression dimensions, we conducted a set of path analyses to look more directly at the potential role of self-esteem as a mediator of the relations between specific problem-solving dimensions and specific aggression dimensions. However, only those di-

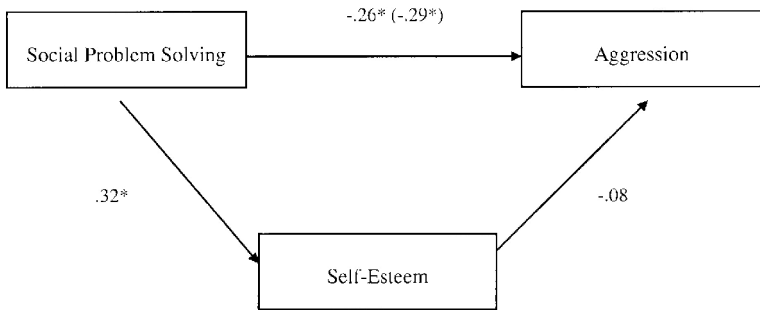


FIGURE 1. Results of path analyses delineating paths in which self-esteem is taken to serve as a potential mediator of the link between general social problem-solving and general aggression ($N = 205$). Number within the parentheses reflects the original path prior to controlling for self-esteem. All numbers represent standardized beta weights. $*p < .001$.

mensions that met the first three conditions for mediation were included in these analyses. Based on these criteria, we examined two aggression dimensions and four problem-solving dimensions. The aggression dimensions were anger and hostility. When anger was the dependent variable, the problem-solving dimensions were negative problem orientation, impulsivity/carelessness style, and avoidance style. When hostility was the dependent variable, the problem-solving dimensions were positive problem orientation, negative problem orientation, impulsivity/carelessness style, and avoidance style. Table 2 shows the standardized path coefficients between each problem-solving dimension and anger and hostility before and after controlling for self-esteem. As the table shows, all of the paths between the problem-solving dimensions and anger and hostility remained highly significant even after self-esteem was controlled, which is consistent with the results of the general analysis reported above.

EXAMINING THE POTENTIAL ROLE OF SOCIAL PROBLEM SOLVING AS A MEDIATOR OF THE LINK BETWEEN SELF-ESTEEM AND AGGRESSION

Following our earlier approach, before looking at specific social problem-solving and aggression dimensions, we wanted to examine whether general social problem solving would mediate the relationship

TABLE 2. Standardized Path Coefficients Between Specific Problem-Solving Dimensions and Aggression Before and After Controlling for Self-Esteem

Problem-Solving Measure	Aggression Measure	
	Anger	Hostility
Before Controlling for Self-Esteem		
PPO	—	-.23***
NPO	.38***	.53***
ICS	.26***	.38***
AS	.21***	.36***
After Controlling for Self-Esteem		
PPO	—	-.16*
NPO	.34***	.48***
ICS	.23***	.34***
AS	.17*	.30***

Note. $N = 205$. PPO = Positive Problem Orientation; NPO = Negative Problem Orientation; ICS = Impulsivity/Carelessness Style; AS = Avoidance Style. * $p < .05$; *** $p < .001$.

between self-esteem and general aggression. The results of our path analysis are presented in Figure 2. As the figure shows, when social problem solving was included in the model, the path between self-esteem and general aggression became nonsignificant ($\beta = -.08$), while the path between self-esteem and general social problem solving and the path between general social problem solving and general aggression remained significant, $\beta = .32$, $p < .001$ and $\beta = -.26$, $p < .001$, respectively. These results indicate that general social problem solving fully mediates the link between self-esteem and general aggression.

Next, we conducted an additional set of path analyses to look at specific problem-solving dimensions as potential mediators between self-esteem and specific aggression dimensions. For the same reasons noted earlier, we focused on the same problem-solving and aggression dimensions that were examined in the previous path analyses. The standardized path coefficients between self-esteem and anger and hostility, before and after controlling for each problem-solving dimension, are presented in Table 3. The results suggest that the full mediating effect found in the general analysis reported above can be accounted for by the mediating effect of negative problem orientation in the relations between self-esteem and anger and hostility. When negative problem orientation was included in the model, the path between self-esteem and anger was reduced to a nonsignificant level. In addition, a large reduction was also found in the path between self-esteem and hostility ($\Delta\beta =$

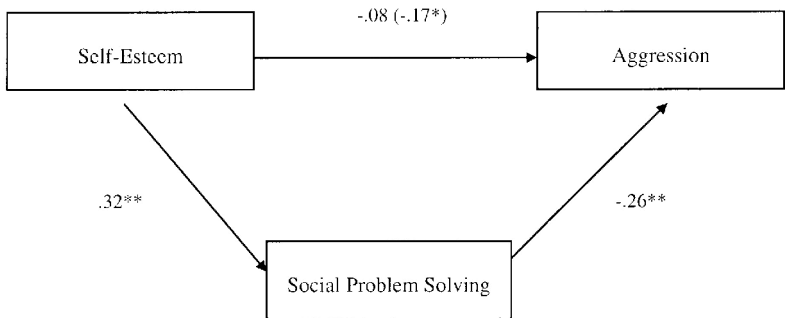


FIGURE 2. Results of path analyses delineating paths in which general social problem solving is taken to serve as a potential mediator of the link between self-esteem and general aggression ($N = 205$). Number within the parentheses reflects the original path prior to controlling for general social problem solving. All numbers represent standardized beta weights. $*p < .05$. $**p < .001$.

.17), although this path remained significant at the .05 level, which suggests that negative problem orientation is at least a strong partial mediator in the link between self-esteem and hostility as well.

DISCUSSION

In general, the results of this study support all five major hypotheses. First, self-esteem and social problem-solving ability were found to be significantly correlated. Second, low self-esteem was found to be a significant predictor of subsequent aggression. Third, poor social problem-solving ability was also found to be a significant predictor of subsequent aggression. Fourth, after controlling for self-esteem, social problem solving ability was still significantly related to aggression. Fifth, after controlling for social problem-solving ability, self-esteem was no longer significantly related to aggression. More specifically, however, the results vary for the different dimensions of social problem-solving ability and aggression.

Low self-esteem was found to be associated with less positive problem orientation, more negative problem orientation, more impulsive/careless problem solving, and more problem-solving avoidance. As would be expected, the strongest relationship is with negative problem orientation, which includes negative self-efficacy beliefs, or doubts about one's own ability to solve problems and implement solutions effectively. With

TABLE 3. Standardized Path Coefficients Between Self-Esteem and Aggression Before and After Controlling Specific Problem-Solving Dimensions

Self-Esteem	Aggression Measure	
	Anger	Hostility
Before Controlling for Problem Solving	-.20**	-.32***
After Controlling for PPO	—	-.28***
After Controlling for NPO	-.08	-.16*
After Controlling for ICS	-.16*	-.26***
After Controlling for AS	-.16*	-.25***

Note. $N = 205$. PPO = Positive Problem Orientation; NPO = Negative Problem Orientation; ICS = Impulsivity/Carelessness Style; AS = Avoidance Style. * $p < .05$; ** $p < .01$; *** $p < .001$.

regard to the link between self-esteem and aggression, low self-esteem was found to be significantly related to the affective and cognitive components of aggression (viz., anger and hostility), but not the instrumental components (viz., physical and verbal aggression). These findings replicate the results of Buss and Perry (1992) and may help to explain the negative results in studies that focused only on measures of physical aggression or violence (e.g., Bushman & Baumeister, 1998; Baumeister et al., 2000).

Focusing now on the link between social problem solving and aggression, all five problem-solving dimensions were significantly related to hostility. Specifically, less constructive problem solving (viz., positive problem orientation and rational problem solving) and more dysfunctional problem solving (viz., negative problem orientation, impulsivity/carelessness style, and avoidance style) were associated with more hostility. In addition, all three dysfunctional problem-solving dimensions were found to be related to more anger and one of these dimensions, namely, impulsivity/carelessness style, was also found to be related to more physical aggression.

Given the above findings, how are self-esteem, social problem solving, and aggression related to each other? Using path analyses, we found no support for a mediational model that has self-esteem mediating the relationship between problem-solving ability and aggression. However, support was found for an alternative model in which social problem solving mediates the relationship between self-esteem and aggression. More specifically, negative problem orientation was found to fully mediate the relationship between self-esteem and anger. In addition, the results suggest that negative problem orientation is also a partial mediator of the relationship between self-esteem and hostility. According to the

items of the SPSI-R, individuals who report a more negative orientation toward problems in living tend to view a problem as a threat rather than a challenge, doubt their own ability to solve problems effectively, and exhibit a low tolerance for problems (i.e., easily become frustrated and upset when confronted with problems). From a developmental perspective, low self-esteem can be viewed as a dysfunctional personality characteristic that is formed very early in life and influences the later development of a negative orientation toward problems in living which, in turn, reduces the likelihood of positive problem-solving outcomes and increases the likelihood of anger and hostility.

Overall, the results of this study extend the previous research that has found a link between social problem-solving deficits and aggression in children and adolescents (e.g., Lochman & Dodge, al., 1994) by showing that these findings are generalizable to a young adult population. In particular, they suggest that a negative problem orientation may play an important role in contributing to the cognitive and affective components of aggression (viz., hostility and anger) above and beyond the influence of low self-esteem. With regard to future research, two directions are noteworthy. First, in addition to self-esteem, several other personality traits have also been found to be related to aggression as measured by the AQ, including emotionality, impulsiveness, and competitiveness (Buss & Perry, 1992). Future research should examine the possible mediating role of social problem solving in these relationships as well. Social problem solving may play a broader role in mediating the relationship between personality and aggression. Second, the participants in this study were drawn from a very diverse population of college students consisting of both sexes and several different racial/ethnic groups, including Caucasians, Asian Americans, African Americans, and Latin Americans. Future research should use larger samples drawn from this diverse population to examine possible gender and ethnic differences in the relationships between personality, social problem solving, and aggression.

The present study also has important clinical implications. The findings suggest that low self-esteem and deficits in problem-solving ability may be important risk factors for aggression and violence. This knowledge could be useful when selecting participants for prevention programs. In addition, it could also be useful when attempting to develop effective preventive and treatment interventions for aggressive clients and those at risk for aggression and violence. The findings suggest that interventions should include the dual goals of improving self-esteem and increasing effective social problem solving. In particular, interventions should focus on correcting negative problem orientation beliefs and promoting a more positive and optimistic orientation toward prob-

lems in living. Problem-solving training procedures designed to achieve these goals are described in D'Zurilla and Nezu (1999).

In closing, the present study has two limitations that suggest caution is needed when interpreting the results. First, although a prospective design was used, it is still correlational in nature and, thus, raises the same causal questions as any other correlational study. Therefore it is still possible that aggression might influence self-esteem and social problem solving instead of vice versa. Future experimental and longitudinal studies are needed to determine more conclusively the causal nature of the relationships found in this study. For example, in a recent experimental study by Davey, Jubb, and Cameron (1996), a negative problem orientation was induced by providing false feedback to subjects about their performance on a series of problem-solving tasks. This manipulation resulted in higher scores on measures of worrying and anxiety. Similar studies can be done to determine the effects of negative problem orientation on measures of anger and hostility. The second limitation is that all of the study measures are self-report. Hence, one cannot rule out the possibility that a negative response bias might have influenced the relationships found in this study. For example, a general disposition to view oneself and the world negatively might result in a consistent tendency to respond in a negative direction on all of the measures. Clearly, additional studies using multiple methods and designs are needed to extend the present findings.

REFERENCES

- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Baumeister, R.F., Bushman, B.J., & Campbell, W.K. (2000). Self-esteem, narcissism, and aggression: Does violence result from low self-esteem or from threatened egotism? *Current Directions in Psychological Science, 9*, 26-29.
- Baumeister, R.F., Smart, L., & Boden, J.M. (1997). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Review, 103*, 5-33.
- Bednar, R.L., Wells, M.G., & Peterson, S.R. (1989). *Self-esteem: Paradoxes and innovations in clinical theory and practice*. Washington, DC: American Psychological Association.
- Boyce, P., & Parker, G. (1989). Development of a scale to measure interpersonal sensitivity. *Australia New Zealand Journal of Psychiatry, 23*, 341-351.
- Burns, L. R., & D'Zurilla, T. J. (1999). Individual differences in perceived information processing in stress and coping situations: Development and validation of the Perceived Modes of Processing Inventory. *Cognitive Therapy and Research, 23*, 345-371.
- Bushman, B.J., & Baumeister, R.F. (1998). Threatened egotism, narcissism, self-esteem, and

- direct and displaced aggression: Does self-love or self-hate lead to violence? *Journal of Personality and Social Psychology*, 75, 219-229.
- Buss, A.H., & Durkee, A. (1957). An inventory for assessing different kinds of hostility. *Journal of Consulting Psychology*, 21, 343-349.
- Buss, A.H., & Perry, M. (1992). The Aggression Questionnaire. *Journal of Personality and Social Psychology*, 63, 452-459.
- Chang, E.C. (2001). Life stress and depressed mood among adolescents: Examining a cognitive-affective mediational model. *Journal of Social and Clinical Psychology*, 20, 403-416.
- Davey, G.C.L., Jubb, M., & Cameron, C. (1996). Catastrophic worrying as a function of changes in problem-solving confidence. *Cognitive Therapy and Research*, 20, 333-344.
- 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). New York: Academic Press.
- D'Zurilla, T. J., & Nezu, A.M. (1990). Development and preliminary evaluation of the Social Problem-Solving Inventory. *Psychological Assessment*, 2, 156-163.
- D'Zurilla, T. J., & Nezu, A. M. (1999). *Problem-solving therapy: A social competence approach to clinical intervention* (2nd ed.). New York: Springer.
- D'Zurilla, T. J., Nezu, A.M., & Maydeu-Olivares, A. (2002). *Social Problem-Solving Inventory Revised (SPSI-R): Technical manual*. North Tonawanda, NY: Multi-Health Systems, Inc.
- Green, R.A., & Murray, E.J. (1973). Instigation to aggression as a function of self-disclosure and threat to self-esteem. *Journal of Consulting and Clinical Psychology*, 40, 440-443.
- Harris, J.A. (1997). A further evaluation of the Aggression Questionnaire: Issues of validity and reliability. *Behaviour Research and Therapy*, 35, 1047-1053.
- Holmbeck, G.N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology*, 65, 599-610.
- Lochman, J.E., & Dodge, K.A. (1994). Social-cognitive processes of severely violent, moderately aggressive, and nonaggressive boys. *Journal of Consulting and Clinical Psychology*, 62, 366-374.
- Lochman, J.E., & Lampron, L.G. (1986). Situational social problem-solving skills and self-esteem of aggressive and nonaggressive boys. *Journal of Abnormal Child Psychology*, 14, 605-617.
- Lochman, J.E., Wayland, K.K., & White, K.J. (1993). Social goals: Relationship to adolescent adjustment and to social problem solving. *Journal of Abnormal Child Psychology*, 21, 135-151.
- Loeber, R., & Dishion, T.J. (1985). Boys who fight at home and school: Family conditions influencing cross-setting consistency. *Journal of Consulting and Clinical Psychology*, 52, 759-768.
- Maydeu-Olivares, A., & D'Zurilla, T.J. (1995). A factor analysis of the Social Problem-Solving Inventory using polychoric correlations. *European Journal of Psychological Assessment*, 11, 98-107.
- Maydeu-Olivares, A., & D'Zurilla, T. J. (1996). A factor-analytic study of the Social Problem-Solving Inventory: An integration of theory and data. *Cognitive Therapy and Research*, 20, 115-133.
- McCabe, R.E., Blankstein, K.R., & Mills, J.S. (1999). Interpersonal sensitivity and social problem solving: Relations with academic and social self-esteem, depressive symptoms, and academic performance. *Cognitive Therapy and Research*, 23, 587-604.
- Roberts, J. E., & Kassel, J. D. (1997). Liable self-esteem, life stress, and depressive symptoms: Prospective data testing a model of vulnerability. *Cognitive Therapy and Research*, 21, 569-589.

- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Rice, K.G., Ashby, J.S., & Slaney, R.B. (1998). Self-esteem as a mediator between perfectionism and depression: A structural equations analysis. *Journal of Counseling Psychology, 45*, 304-314.
- Shisslak, C.M., Pazda, S.L., & Crago, M. (1990). Body weight and bulimia as discriminators of psychological characteristics among anorexic, bulimic, and obese women. *Journal of Abnormal Psychology, 99*, 380-384.
- Tulloch, R. (1997). *Anger and violence*. London, UK: Routledge.
- Van Hasselt, V.B., & Hersen, M. (2000). *Aggression and violence: An introductory text*. Boston: Allyn & Bacon.
- Wodarski, J. S., & Wodarski, L. A. (1998). *Preventing teenage violence: An empirical paradigm for schools and families*. New York: Springer.