

Perceived Coping as a Mediator Between Attachment and Psychological Distress: A Structural Equation Modeling Approach

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This study examined perceived coping (perceived problem-solving ability and progress in coping with problems) as a mediator between adult attachment (anxiety and avoidance) and psychological distress (depression, hopelessness, anxiety, anger, and interpersonal problems). Survey data from 515 undergraduate students were analyzed using structural equation modeling. Results indicated that perceived coping fully mediated the relationship between attachment anxiety and psychological distress and partially mediated the relationship between attachment avoidance and psychological distress. These findings suggest not only that it is important to consider attachment anxiety or avoidance in understanding distress but also that perceived coping plays an important role in these relationships. Implications for these more complex relations are discussed for both counseling interventions and further research.

In the past decade, researchers have found that Bowlby's attachment theory (1973, 1988) has important implications for counseling (Cassidy & Shaver, 1999; Lopez, 1995; Lopez & Brennan, 2000; Lopez, Mitchell, & Gormley, 2002; Mallinckrodt, 2000). A central feature of Bowlby's theory is that the security of the bonds developed in childhood with caregivers affects psychological adjustment and coping resilience and conversely that insecure attachment is associated with relatively ineffective coping. Insecure attachment has been conceptualized as being of qualitatively different types (e.g., Bartholomew & Horowitz, 1991), but recent empirical evidence suggests that it may be more accurate to characterize adult attachment in terms of the two continuous orthogonal dimensions of attachment *anxiety* and attachment *avoidance* (Brennan, Clark, & Shaver, 1998; Fraley & Waller, 1998). Adult attachment anxiety is believed to result from a person's underlying negative working model of himself or herself as essentially unlovable. Adult attachment avoidance is believed to result from an underlying negative working model of others as essentially untrustworthy or malevolent (Brennan et al., 1998). According to attachment theory, negative working models of self and others develop according to the degree to which a child experiences caregivers who are either inconsistent or consistently unresponsive to her or his needs (Ainsworth, Blehar, Waters, & Wall, 1978; Brennan et al., 1998). *Secure* adults are relatively free

of both attachment anxiety and attachment avoidance and are believed to have experienced relatively consistent responsiveness to their childhood emotional needs.

A growing body of evidence suggests links between the dimensions of insecure attachment and psychological distress. For example, studies have shown that insecure adult attachment is related to negative affect (Simpson, 1990); lower levels of emotional adjustment (Lapsley, Rice, & FitzGerald, 1990; Rice, FitzGerald, Whaley, & Gibbs, 1995; Rice & Whaley, 1994); depression, anxiety, and hostility (Priel & Shamai, 1995; Mikulincer, Florian, & Weller, 1993; Robert, Gotlib, & Kassel, 1996); shame, anger, fear of negative evaluation, and pathological narcissism (Wagner & Tangney, 1991); and interpersonal problems and core relationship conflicts (Bartholomew & Horowitz, 1991; Horowitz, Rosenberg, & Bartholomew, 1993; Mallinckrodt & Wei, 2000). In general, previous studies have shown that securely attached persons are significantly less anxious, depressed, and angry and have less interpersonal distress than those with either anxious or avoidant attachment (for a review, see Lopez & Brennan, 2000).

Attachment theory (Bowlby, 1973, 1988) holds that, optimally, children derive important coping resources from the secure attachments they develop with caregivers. Infants and young children who discover that their caregivers are relatively responsive to their cries of distress and bids to elicit comfort develop a growing sense of their own capacity to have important needs met through direct communication (e.g., "If I ask for help, Mom will help me"; "If I let Dad know that I'm scared, he will help me feel better"). These experiences of successful attempts to modify the behavior of caregivers through direct communication—especially those attempts that lead to having primary needs for safety and comfort met—lead to internalized perceptions of oneself as capable of performing effective goal-directed behavior, perceptions of others as responsive and caring, and the belief that relationships are flexible and capable of being influenced. In contrast, infants who experience repeated failure to achieve desired outcomes in the attachment relationship are more likely to have representations of themselves as ineffective, others as unreliable, and relationships as

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unrewarding. Thus, the consistency of caregivers' appropriate responses to an infant's goal-directed social behavior forms the basis for the adult sense of social competency (Gianino & Tronick, 1988; Mallinckrodt, 2000; Tronick, 1989).

In addition to a sense of efficacy for having important emotional needs met, secure attachments with caregivers provide children with a sense of felt security (Sroufe & Waters, 1977), a safe haven to which the young child can return when distressed, and a secure base from which the child can explore the environment and, most important, solve problems posed by new situations without the direct presence of a caregiver (Bowlby, 1988). A review of the research on attachment and the cognitive appraisal component of coping concluded that individuals with secure attachment tend to cope with distress by acknowledging it, freely expressing emotion, and constructively coping with the distress (Mikulincer & Florian, 1998). Clients who develop secure attachments to their therapists were found to engage in greater depth of exploration in the early phases of brief therapy (Mallinckrodt, Porter, & Kivlighan, 2003). Conversely, people with anxious attachment tend to cope with distress by exaggerating the distress as threatening and uncontrollable, reacting with strong emotional responses (Lopez, Mauricio, Gormley, Simko, & Berger, 2001), and relying on others' reassurance to moderate affect. Similarly, people with avoidant attachment tend to cope with distress by protecting themselves against others' rejection, inhibiting emotional displays, and denying negative affect. Thus, unfortunately, coping strategies preferred by adults with either anxious or avoidant attachment tend to be relatively ineffective and tend to actually increase their distress (Kobak & Sceery, 1988; Lopez et al., 2001; Mallinckrodt, 2001; Mikulincer & Florian, 1998).

One line of research using problem-solving appraisal has shown a strong link between applied problem solving or coping and psychological distress. A growing body of research suggests that perceived problem-solving effectiveness is related to psychological distress, including depression, anxiety, hopelessness, anger, and interpersonal distress (Heppner & Lee, 2002). Thus, when people do not think that they can effectively cope with problems, they are likely to become depressed, anxious, hopeless, and angry. Persons who perceive themselves as ineffective problem solvers report themselves to be more interpersonally sensitive, less trusting of other people, more socially anxious, and less interpersonally assertive and engage in less social support. In general, perceived problem-solving effectiveness is negatively related to different indices of social skills as well (Heppner & Lee, 2002). In sum, this line of research has provided a strong link between perceived problem-solving effectiveness and psychological distress (i.e., depression, hopelessness, anxiety, anger, and interpersonal distress).

From the above review and discussion, it is clear that there are well-established links among attachment, perceived problem solving, and psychological distress (Cassidy & Shaver, 1999; Lopez & Brennan, 2000; Lopez et al., 2001; Mallinckrodt, 2000). Persons with either attachment anxiety or attachment avoidance tend to use ineffective coping strategies, which in turn increase their levels of psychological distress. However, few studies have tested a mediational model to explore how affect regulation or cognitive processes (e.g., perceived coping) might mediate the link between attachment and psychological distress suggested by Kenny and Rice (1995). Lopez et al. (2001) reported results of regression analyses suggesting that problem coping styles partially mediate the impact of attachment anxiety on distress, and further that after

attachment anxiety is controlled for, attachment avoidance is not significantly related to distress. However, given the small sample size, these findings should be considered preliminary. Lopez and his colleagues (2002) also reported that attachment anxiety is associated with coping styles (suppressive and reactive) and a composite distress index. However, attachment avoidance was not significantly related to either coping style. Lopez et al. (2002) suggested that there is a need to use larger samples and more powerful analyses such as structural equation modeling techniques to more adequately test this mediational model. Such research could form the basis for useful clinical interventions. If perceived coping is a mediator of the link between attachment and psychological distress, it may be possible to intervene by increasing people's perception of their coping effectiveness and thereby decrease their distress. Thus, the primary research question in the present study was: Does perceived coping mediate the relation between attachment and psychological distress?

Specifically, the purpose of the present study was to use a structural equation modeling approach with the statistical power available from a large sample to examine the potential mediating effects of perceived coping on the relation between adult attachment and psychological distress. Moreover, the study used a multifaceted conceptualization of both coping and psychological distress. The initial hypothesized model for the present study contained two presumed causal antecedents (attachment anxiety and attachment avoidance), one latent mediator variable (perceived coping), and one latent outcome variable (psychological distress). Two latent variables (attachment anxiety and attachment avoidance) were assessed with the Adult Attachment Scale (AAS; Collins & Read, 1990). The perceived coping latent variable was assessed by two sources. The first was to use the Suppressive Style and Reactive Style subscales of the Problem-Focused Style of Coping (PF-SOC; Heppner, Cook, Wright, & Johnson, 1995), which were used in Lopez and his colleagues' (2001, 2002) studies. We also added an additional dimension of perceived problem-solving effectiveness from the Problem-Solving Inventory—Form B (PSI; Heppner, 1988), which has been found to consistently predict psychological distress in numerous studies (Heppner & Lee, 2002). Together the PSI and PF-SOC may provide a more complete assessment of perceived problem-solving/coping effectiveness than either measure alone. It is also important to note that suppressive coping, reactive coping, and the PSI are dispositional measures of coping, and a range of cognitive, affective, and behavioral domains were included in developing these measures (Heppner et al., 1995). The psychological distress latent variable was assessed with commonly used measures of depression, anxiety, hopelessness, anger, and interpersonal distress. On the basis of the previous research, this study tested two specific hypotheses: (a) perceived coping would mediate the association between attachment anxiety and psychological distress, and (b) perceived coping would mediate the association between attachment avoidance and psychological distress.

Method

Participants

Usable surveys were obtained from 515 undergraduate students enrolled at a large midwestern university. The sample included 349 women (68%) and 165 men (32%), who were between 18 and 41 years old ($M = 18.93$,

$SD = 2.26$). About 67% of the participants were freshmen. In terms of ethnic identification, 85% indicated White; 8%, African American; 3%, Asian American; 1%, Hispanic American; 1%, Native American; 1%, multiracial American; 1%, non-U.S. citizen; and 1%, other. All participants were volunteers who received research credit toward a course requirement.

Instruments

AAS. The AAS (Collins & Read, 1990) is an 18-item measure designed to assess beliefs and attitudes about adult relationships analogous to those thought to be important in early attachment relationships. The AAS was devised to extend the 3-item scale of Hazan and Shaver's (1987) measure of three theoretical attachment styles: secure, avoidant, and anxious-ambivalent. Each item uses a 5-point Likert-type scale ranging from *not at all characteristic* (1) to *very characteristic* (5) of me. The AAS has three subscales: Close, Depend, and Anxiety. The Close subscale (6 items) assesses the extent to which a person is comfortable with closeness and intimacy. The Depend subscale (6 items) assesses the degree to which the individual is comfortable depending on others and believes that people can be relied on when needed. The Anxiety subscale (6 items) assesses the extent to which a person is worried about being abandoned and rejected by others. Hammen et al. (1995) reported that Cronbach's alphas were .74, .83, and .85 for the Close, Depend, and Anxiety subscales, respectively, and test-retest reliabilities (6-month interval) for the Close, Depend, and Anxiety subscales were .71, .70, and .64, respectively. Convergent validity was demonstrated in significant correlations between the AAS and the original Hazan and Shaver measure (Hammen et al., 1995). With respect to construct validity, the proportion of positive memories of the mother was significantly related to the Close, Depend, and Anxiety subscales (Hammen et al., 1995).

In a recent extensive factor analysis of 60 adult attachment measure subscales administered to over 1,000 undergraduate participants, factor analyses conducted by Brennan et al. (1998) identified two underlying dimensions of attachment avoidance and attachment anxiety. The Depend and Close subscales of the AAS had negative correlations ($r = -.79$ and $-.84$, respectively) with the avoidance dimension, whereas the Anxiety AAS subscale had a positive correlation ($r = .74$) with the anxiety dimension. Thus, in the present study, the Anxiety subscale was used to represent the continuous dimension of attachment anxiety, and the reverse scores of the Depend and Close subscales were used to represent the continuous dimension of attachment avoidance. In the present study, Cronbach's alpha for the six items measuring attachment anxiety was .70, and for the 12 items measuring attachment avoidance, it was .79. In order to create two latent variables of attachment anxiety and attachment avoidance, we created 3-item bundles (or parcels) from six items measuring attachment anxiety and 3-item bundles from 12 items measuring attachment avoidance (Russell, Kahn, Spoth, & Altmaier, 1998).

PSI. The PSI (Heppner, 1988) is a 32-item questionnaire designed to assess an individual's awareness and evaluation of his or her problem-solving effectiveness through a range of cognitive, affective, and behavioral items. It measures individuals' perceptions of their problem-solving abilities rather than their actual problem-solving ability. Each item is measured on a 6-point Likert scale ranging from *strongly agree* (1) to *strongly disagree* (6). The PSI contains three subscales: (a) Problem-Solving Confidence (PSC; 11 items), (b) Approach-Avoidance Style (AA; 16 items), and (c) Personal Control (PC; 5 items). The PSC subscale taps belief and trust in one's own problem-solving abilities. The AA subscale measures a general tendency to either approach or avoid problem-solving activities. The PC subscale assesses the belief that one is in control of one's own emotions and behavior while problem solving. High scores on the PSI total score indicate perceived ineffective problem-solving attitudes and behaviors, and low scores suggest perceived effective problem-solving attitudes and behaviors. Coefficient alphas ranging from .72 to .90 across a number of populations and cultures provide empirical support for the internal consistency of the PSI. Test-retest correlations ranging from .83 to

.89 over a 2-week period provide empirical support for the stability of the PSI (Heppner, 1988). In the present study, only the total PSI scale score was used. The coefficient alpha of the PSI was .90 in the present study. In addition, extensive evidence of validity is provided by significant correlations of the PSI in expected directions with cognitions, affective responses, and problem-solving behaviors, as well as with a range of indices of psychological adjustment (Heppner & Lee, 2002).

PF-SOC. The PF-SOC (Heppner et al., 1995) is an 18-item questionnaire that assesses problem-focused activities associated with progress toward resolving problems. In essence, the PF-SOC assesses the extent to which people believe in general that they are coping well and making progress toward resolving their problems. Similar to the PSI, the PF-SOC was developed as a dispositional measure of coping with items of problem-focused cognitive, affective, and behavioral activities (Heppner et al., 1995). Each item uses a 5-point frequency scale ranging from *almost never* (1) to *almost all of the time* (5). The PF-SOC consists of three subscales—Reflective Style, Suppressing Style (SS), and Reactive Style (RS)—derived from factor analysis that reflect different dispositional problem styles. The Reflective Style (7 items) is defined as a tendency to examine causal relationships and plans and to be systematic in coping. The SS (6 items) is defined as a tendency to deny problems and avoid coping activities. The RS (5 items) measures a tendency to have strong emotional responses, distortion, impulsivity, and cognitive confusion (Heppner et al., 1995). In the present study, only the SS and RS factors were used. Higher scores indicate more use of the SS and RS. The PF-SOC appears to be reliable, with coefficient alphas ranging from .73 to .77 and test-retest correlations ranging from .65 to .71 over 3 weeks. The coefficient alphas for SS and RS were both .77 in this study. Validity estimates from three studies suggest the PF-SOC is related to psychological distress, depression, and anxiety in predicted ways. Moreover, the PF-SOC seems to predict indices of maladjustment. In the present study, we used the PSI and two subscales of the PF-SOC, SS and RS, as three indicators for a perceived coping latent variable.

Beck Depression Inventory (BDI). The BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a widely used 21-item self-report measure of depressive symptoms. Each item consists of a depression symptom cluster scored on a 0–3 response scale based on the severity of the symptom. Scores of all items are summed to obtain a total BDI score, with higher scores indicating more severe depression. Internal consistency for the BDI for undergraduates ranges from .78 to .92, with a mean coefficient alpha of .85. In the present study, the coefficient alpha was .87. Test-retest reliabilities for participants without psychiatric disorders range from .60 (7 days) to .83 (1–6 hr), with reports of .78 for a 2-week and a 3-week period. Validity has been demonstrated for the BDI as a measure of depressive symptoms (Beck, 1967; Bumberry, Oliver, & McClure, 1978; Sacco, 1981).

State-Trait Anxiety Inventory—Trait Anxiety Form (STAI-T). The STAI-T (Spielberger, 1983) is a 20-item scale that assesses "relatively stable individual differences in anxiety proneness" (Spielberger, Gorsuch, & Lushene, 1970, p. 3). The STAI-T is used to ask participants to describe how they generally feel. Each item is measured on a 4-point Likert-type scale ranging from *almost never* (1) to *almost always* (4). Higher scores indicate higher trait anxiety. Test-retest reliabilities have been reported for the Trait Anxiety scale ranging from .65 to .75. Coefficient alphas range from .86 to .92; the coefficient alpha was .90 in the present study. Concurrent validity of the STAI-T has been established through extensive empirical testing (Spielberger, 1983).

Trait Anger Scale (TAS). The TAS (Spielberger, 1988) is a 10-item inventory on which participants report how angry they generally feel. Each item uses a frequency scale ranging from (1) *almost never* to (4) *almost always*. The TAS is designed to measure "individual differences in the disposition to experience anger" (Spielberger, 1988, p. 1). The TAS has two subscales: Anger Temperament and Anger Reaction. Anger Temperament is a measure of "a general propensity to experience and express anger without specific provocation" (Spielberger, 1988, p. 1). Anger Re-

action measures “individual differences in the disposition to express anger when criticized or treated unfairly by other individuals” (Spielberger, 1988, p. 1). Total scores range from 10 to 40. A higher score on the TAS indicates that the individual experiences more anger. Coefficient alphas on the TAS range from .81 to .84. The coefficient alpha was .85 in the present study. Evidence for validity is provided by positive correlations between the TAS and many other measures of anger and anger-related constructs. In addition, the TAS reliably discriminates high- from low-anger groups (Deffenbacher, 1992; Deffenbacher et al., 1996). Although the TAS is moderately correlated with anxiety (Pearson product-moment correlations ranging from .30 to .40), consistent evidence of discriminant validity has been found (Deffenbacher, 1992; Deffenbacher et al., 1996; Spielberger, 1988).

Hopelessness Scale (HS). The HS (Beck, Weissman, Lester, & Trexler, 1974) is a 20-item true-false inventory that assesses the degree to which individuals’ cognitive schemas are characterized by pessimistic expectations. Scores can range from 0 to 20, with higher scores indicating a greater degree of hopelessness. Internal consistency of .93 has been reported, along with concurrent validity of .74 with clinical rating of hopelessness and .60 with other scales of hopelessness (Beck et al., 1974). In the present study, the coefficient alpha for HS was .78.

Inventory of Interpersonal Problems—Short Circumplex Form (IIP-SC). The IIP-SC (Soldz, Budman, Demby, & Merry, 1995) is a 32-item measure designed to assess individuals’ interpersonal distress. It is a short form of the 64-item IIP Circumplex Form (IIP-C; Alden, Wiggins, & Pincus, 1990), and the IIP-C was extracted from the original 127-item IIP (Horowitz, Rosenberg, Baer, Ureno, & Villaseñor, 1988). It contains eight subscales: Domineering, Vindictive, Cold, Social Avoidant, Nonassertive, Exploitable, Overly Nurturant, and Intrusive. Each item is answered using a 5-point Likert-type scale (0 = *not at all*, 1 = *a little bit*, 2 = *moderately*, 3 = *quite a bit*, and 4 = *extremely*). A higher score reflects greater distress related to interpersonal problems. Soldz et al. reported that coefficient alphas for the composite score for the IIP-SC ranged from .88 to .89, and coefficient alphas for the eight subscales ranged from .69 to .83. In the present study, the coefficient alpha for the IIP-SC was .90. Test-retest reliability coefficients with an 8-week interval for the generic outpatients were .83 for the composite score and in a range from .61 to .79 for the scores of the eight subscales. In addition, Soldz et al. indicated that the IIP-SC can be used as a substitute for the IIP on the basis of a high correlation between the IIP-SC and the IIP (Soldz et al., 1995).

Procedure

Participants were recruited from a number of psychology courses at a large midwestern university. The questionnaires were administered in groups of 10–50 people. The procedure required about 1 hr to complete. To determine whether the order in which the questionnaires were given had any effect on the results, two forms of the questionnaire packet were created with two different sequences of measures. The completed questionnaires and consent forms were collected separately to preserve anonymity. The participants were told that the purpose of the research was “to explore the process of psychological adjustment in college students.”

Results

Preliminary Analyses and Descriptive Statistics

In the preliminary analyses, we first examined the invariance across gender to determine whether sex might serve as a confounding variable related to the main analyses. A series of multiple-group analyses were conducted using LISREL (Version 8.50) to check whether female and male groups responded the same in the measurement model and structural model (Byrne, 1998). In the measurement model, researchers are usually interested in whether the patterns of factor loadings and the intercorrelations among the factors are invariant across sex (Byrne, 1998). Two models (a

freely estimated model and a constrained model) were used to determine whether the measurement model was the same across sex. The freely estimated model was allowed to estimate the factor loadings and the intercorrelations among factors without restriction, whereas in the constrained model factor loadings and intercorrelations among factors were set to identical values for the female and male groups. Both models indicated acceptable fit indices—for example, a comparative fit index (CFI) of .93 (see Table 1). Comparison of the freely estimated model and the constrained model resulted in a nonsignificant chi-square difference, $\Delta\chi^2(20, N = 513) = 23.00, p > .05$ (see Table 1), indicating that the measurement model was equivalent for men and women.

In addition, in the structural model, we first constrained the factor loadings to be equal to ensure that each latent variable was measuring the same latent construct across sex. Next we compared each of four alternative models with the freely estimated model and the constrained model, respectively (see Table 1). The four alternative models were as follows: Model A, partially mediated for both attachment anxiety and attachment avoidance; Model B, fully mediated for both attachment anxiety and attachment avoidance; Model C, partially mediated for attachment anxiety and fully mediated for attachment avoidance; and Model D, fully mediated for attachment anxiety and partially mediated for attachment avoidance. When the freely estimated model and the constrained models were compared, there were no significant chi-square differences found among Models A, B, C, or D by sex (see Table 1). These results indicated that the four alternative structural models were equivalent for men and women. In addition, the same procedure was used to examine the effect for the order of two different survey forms. The results also revealed no significant differences between the two survey forms (a table of these results may be obtained from Meifen Wei). Thus, because order and sex effects did not produce significant differences in the measurement model or structural model, the data were combined across sex and order in all of the subsequent analyses.

In addition, the mean, skew, and kurtosis of 10 observed variables were examined to check for normality of distribution (see Table 2). All the skew and kurtosis values of the 10 observed variables were less than 1.0, except for BDI and HS. In general, the scores from this sample can be characterized as having a normal distribution. However, a square-root transformation was conducted for the BDI and HS variables. Two variables were created and called BDIs and HSs. The skew and kurtosis for the BDIs (.05 and $-.00$) and HSs (.15 and .26) indicate a normal distribution. The BDI and BDIs, as well as the HS and HSs, are highly correlated ($r = .94$ and $r = .93$, respectively). Thus, the BDIs and HSs transformed variables were used in subsequent analyses. Means, standard deviations, and zero-order correlations for the 10 observed variables are shown in Table 2.

Measurement Model

The analysis of the proposed mediation model followed the two-step procedure recommended by Anderson and Gerbing (1988). In the first step, confirmatory factor analysis (CFA) was used to develop a measurement model with an acceptable fit to the data. Once an acceptable measurement model was developed, the structural model was tested in the second step. A measurement model is equivalent to a CFA in which each latent construct is allowed to covary with every other latent construct. The CFA

Table 1
Summary of Model Fit Indices and Multiple-Group Comparisons for Sex Differences

Model	Overall χ^2	df	RMSEA	CI for RMSEA	CFI	SRMR	$\Delta\chi^2(df)$
Multiple-group comparison—measurement model							
1. All freely estimated	319.36*	142	.07	.06–.08	.93	.06	
2. FL and CF constrained	342.36*	162	.07	.06–.08	.93	.08	23.00(20)
Multiple-group comparison—structural model							
1. Model A: Freely estimated	331.65*	152	.07	.06–.08	.93	.06	
2. Model A: Constrained	339.29*	157	.07	.06–.08	.93	.08	7.64(5)
3. Model B: Freely estimated	355.36*	156	.07	.06–.08	.93	.07	
4. Model B: Constrained	361.61*	159	.07	.06–.08	.92	.08	6.25(3)
5. Model C: Freely estimated	352.30*	154	.07	.06–.08	.93	.07	
6. Model C: Constrained	361.58*	158	.07	.06–.08	.92	.08	9.28(4)
7. Model D: Freely estimated	333.13*	154	.07	.06–.08	.93	.07	
8. Model D: Constrained	339.32*	158	.07	.06–.08	.93	.08	6.18(4)

Note. $N = 513$. RMSEA = root-mean-square error of approximation; CI = confidence interval; CFI = comparative fit index; SRMR = standardized root-mean-square residual; $\Delta\chi^2$ = chi-square in the constrained model – chi-square in freely estimated model; All freely estimated = factor loadings, intercorrelations among factors, and error variances were free to estimate; FL and CF constrained = factor loadings and intercorrelations among factors were constrained to equality; Model A = partially mediated for both attachment anxiety and attachment avoidance; Model B = fully mediated for both attachment anxiety and attachment avoidance; Model C = partially mediated for attachment anxiety and fully mediated for attachment avoidance; Model D = fully mediated for attachment anxiety and partially mediated for attachment avoidance.

* $ps < .001$.

consisted of four latent variables and 14 observed variables (see Figure 1). All latent variables were permitted to correlate with one another. The measurement model was estimated using the maximum-likelihood method in the LISREL (Version 8.50) program. As suggested by Hu and Bentler (1999) and Quintana and Maxwell (1999), three indices were used to assess goodness of fit of the models: the root-mean-square error of approximation (RMSEA; best if close to .06 or less), the CFI (best if close to .95 or greater), and the standardized root-mean-square residual

(SRMR; best if close to .08 or less). Finally, the chi-square difference was used to compare nested models.

An initial test of the measurement model resulted in relatively good fit indices, $\chi^2(71, N = 514) = 241.56, p = .001$; RMSEA = .07 (90% lower confidence limit = .06, and 90% upper confidence limit = .08); CFI = .94; SRMR = .05. Also, all of the factor loadings were significant ($p < .001$), which provides evidence supporting the convergent validity of the indicators (Anderson & Gerbing, 1988). Thus, all the latent variables appear to have been

Table 2
Zero-Order Intercorrelations, Means, Standard Deviations, Skews, and Kurtosis for 10 Observed Variables

Variable	1	2	3	4	5	6	7	8	9	10
1. Anxiety	—									
2. Avoidance	.25*	—								
3. PSI	.25*	.18*	—							
4. Suppression	.33*	.32*	.46*	—						
5. Reaction	.42*	.26*	.38*	.58*	—					
6. BDI	.29*	.32*	.29*	.44	.40*	—				
7. STAI-T	.37*	.39*	.46*	.46*	.55*	.64*	—			
8. HS	.24*	.34*	.38*	.39*	.33*	.52*	.56*	—		
9. TAS	.29*	.23*	.28*	.26*	.39*	.29*	.43*	.27*	—	
10. IIP-SC	.32*	.37*	.44*	.44*	.48*	.37*	.55*	.40*	.39*	—
<i>n</i>	515	515	515	515	515	515	515	514	515	515
<i>M</i>	14.15	28.79	89.03	12.83	12.27	7.85	39.54	3.29	19.22	40.33
<i>SD</i>	5.00	7.85	19.60	4.30	4.10	6.77	9.78	3.05	5.63	18.34
Skew	0.50	−0.14	−0.11	0.65	0.50	1.44	0.59	1.74	0.95	0.30
Kurtosis	−0.36	−0.37	−0.35	0.14	−0.17	2.50	0.12	3.68	0.80	−0.27

Note. Anxiety = attachment anxiety; Avoidance = attachment avoidance; PSI = Problem-Solving Inventory; Suppression = Suppressive Style subscale from Problem-Focused Style of Coping; Reaction = Reactive Style subscale from Problem-Focused Style of Coping; BDI = Beck Depression Inventory; STAI-T = State-Trait Anxiety Inventory—Trait Anxiety Form; HS = Hopelessness Scale; TAS = Trait Anger Scale; IIP-SC = Inventory of Interpersonal Problems—Short Circumplex Form.

* $p < .0001$.

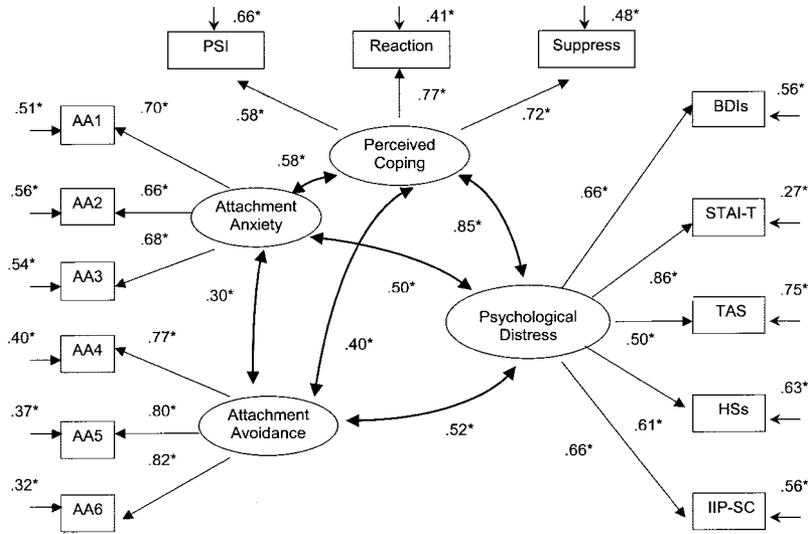


Figure 1. The measurement model ($N = 514$). AA1–AA3 = three parcels from the Anxiety subscale of the Adult Attachment Scale; AA4–AA6 = three parcels from the Depend and Close subscales of the Adult Attachment Scale; PSI = Problem-Solving Inventory; Reaction = Reactive Style subscale from Problem-Focused Style of Coping; Suppress = Suppressive Style subscale from Problem-Focused Style of Coping; BDIs = Beck Depression Inventory (after transformation); STAI-T = State-Trait Anxiety Inventory—Trait Anxiety Form; TAS = Trait Anger Scale; HSs = Hopelessness Scale (after transformation); IIP-SC = Inventory of Interpersonal Problems—Short Circumplex Form. * $p < .001$.

well measured by their respective indicators (observed variables). In addition, the two independent latent variables, mediator latent variable, and dependent latent variable were significantly correlated with each other ($p < .001$). Thus, this measurement model was used to test the theoretical structural model.

Structural Model for Tests of Mediation

The structural model (see Figure 2) was tested using the maximum-likelihood method in the LISREL (Version 8.50) program. According to Holmbeck (1997), three models must be

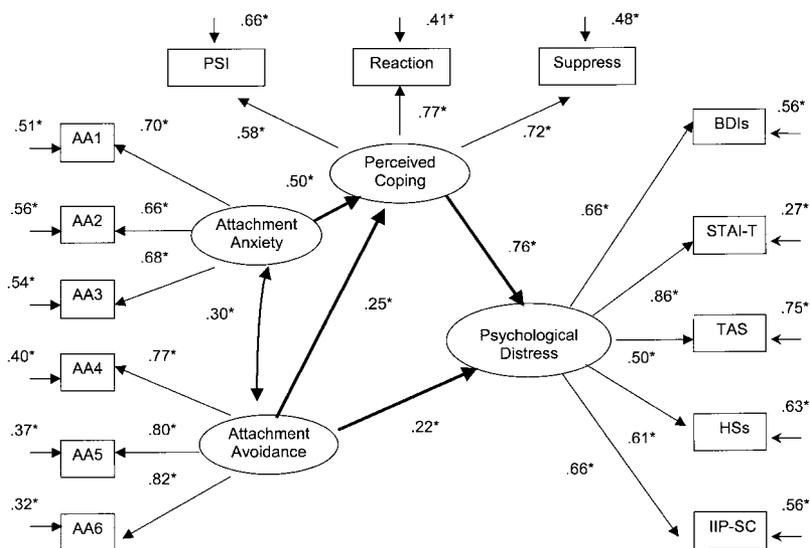


Figure 2. The partially mediated model ($N = 514$). AA1–AA3 = three parcels from the Anxiety subscale of the Adult Attachment Scale; AA4–AA6 = three parcels from the Depend and Close subscales of the Adult Attachment Scale; PSI = Problem-Solving Inventory; Reaction = Reactive Style subscale from Problem-Focused Style of Coping; Suppress = Suppressive Style subscale from Problem-Focused Style of Coping; BDIs = Beck Depression Inventory (after transformation); STAI-T = State-Trait Anxiety Inventory—Trait Anxiety Form; TAS = Trait Anger Scale; HSs = Hopelessness Scale (after transformation); IIP-SC = Inventory of Interpersonal Problems—Short Circumplex Form. * $p < .001$.

Table 3
Structural Paths, Chi-Square, and Fit Indices Among Different Models

Model	χ^2	df	RMSEA	CI for RMSEA	CFI	SRMR	$\Delta\chi^2(df)$
Model A	241.56*	71	.07	.06-.08	.94	.05	A and B: 12.34(2)
Model B	263.90*	73	.07	.06-.08	.93	.06	
Model C	263.87*	72	.07	.06-.08	.93	.06	A and C: 12.31(1)
Model D	241.56*	72	.07	.06-.08	.94	.05	A and D: 0(1)

Note. $N = 514$. RMSEA = root-mean-square error of approximation; CI = confidence interval; CFI = comparative fit index; SRMR = standardized root-mean-square residual; Model A = partially mediated for both attachment anxiety and attachment avoidance; Model B = fully mediated for both attachment anxiety and attachment avoidance; Model C = partially mediated for attachment anxiety and fully mediated for attachment avoidance; Model D = fully mediated for attachment anxiety and partially mediated for attachment avoidance. * $ps < .001$.

estimated to test for mediational effects in structural equation modeling. First, the direct-effect model tests the effect of the predictors (i.e., attachment anxiety and attachment avoidance) on the criterion (i.e., psychological distress) in the absence of the mediator (perceived coping). For the mediation to exist, the path coefficients (from attachment anxiety and attachment avoidance to psychological distress) in the direct-effect model must be significant in order to continue to test the mediational effect. If the path coefficients from attachment anxiety and attachment avoidance to psychological distress were not significant, no mediational effect could exist. The direct path coefficients from attachment anxiety and attachment avoidance to psychological distress were significant (.38 and .39, $ps < .001$) after controlling for the other attachment dimension, respectively, which met Holmbeck's first step for examining a mediational model.

The second step is to test the partially mediated structural model for both attachment avoidance and attachment anxiety, which estimates the direct effects from attachment avoidance and attachment anxiety to psychological distress and adds the three paths from attachment avoidance and attachment anxiety to perceived coping and from perceived coping to psychological distress (see Figure 2). The results of the partially mediated structural model for both attachment avoidance and attachment anxiety were very good (e.g., CFI = .94; see Model A in Table 3). In addition, all factor loadings were significant at the $p < .001$ level, which indicated each latent variable was well represented by the observed variables.

The final step in Holmbeck's (1997) procedure is to compare the partially mediated model (Model A) with the fully mediated model for both attachment avoidance and attachment anxiety (Model B in Table 3), in which the two direct paths from attachment avoidance and attachment anxiety to psychological distress were constrained to zero. The fully mediated model for both attachment avoidance and attachment anxiety provided very good fit indices (e.g., CFI = .93; see Model B in Table 3). When we compared the chi-square differences, a significant difference between the partially (Model A) and the fully (Model B) mediated models, $\Delta\chi^2(2, N = 514) = 12.34, p < .001$, revealed that the partially mediated model for both attachment avoidance and attachment anxiety (Model A) was a better fit for the data.

Because we have two independent latent variables (attachment avoidance and attachment anxiety), two more steps were added to test two alternative models to specify clearly the fully and partially mediated models for attachment avoidance and attachment anxiety

separately. One model is to test a partially mediated model for attachment anxiety and a fully mediated model for attachment avoidance (see Model C in Table 3). The other is to test a fully mediated model for attachment anxiety and a partially mediated model for attachment avoidance (see Model D in Table 3). Model A was used in comparison with Model C and Model D for the best fit model. In Table 3, a significant chi-square difference between Model A and Model C, $\Delta\chi^2(1, N = 514) = 12.31, p < .001$, indicated that Model A was a better fit model for the data. However, the chi-square difference between Model A and Model D was not significant, $\Delta\chi^2(1, N = 514) = .00, p > .05$, suggesting that Model D was a better model.¹ In short, the result indicated that perceived coping fully mediated the association between attachment anxiety and psychological distress but only partially mediated the association between attachment avoidance and psychological distress.

More specifically, as indicated in Figure 2, the standardized mediational effect of attachment anxiety on psychological distress was significant ($.50 \times .76 = .38, Z = 7.53, p < .001$); the 95% confidence interval was 1.59–2.73. The standardized mediational effect of attachment avoidance on psychological distress was also significant ($.25 \times .76 = .19, Z = 4.39, p < .001$); the 95% confidence interval was .37–.95. Moreover, the path coefficient from attachment anxiety to psychological distress was reduced from .38 to .00, and that from attachment avoidance to psychological distress was reduced from .39 to .22 when the direct-effect model was compared with Model D (fully mediated for attachment anxiety and partially mediated for attachment avoidance). In addition, it is important to note that about 39% of the variance in perceived coping was explained by attachment anxiety and attachment avoidance, and about 76% of the variance in psychological distress was explained by attachment anxiety, attachment avoidance, and perceived coping.

Discussion

Although past research has consistently identified linear relations between indices of attachment and psychological distress, our results indicate that attachment influences psychological distress

¹ We actually compared two, three, four, and five indicators for the perceived coping latent variable, and we found the results are identical (the results can be obtained from Meifen Wei).

through perceived coping in more complex ways than was previously hypothesized. The results, which support the hypothesis that perceived coping fully mediates the relations between attachment anxiety and psychological distress, confirm an earlier suggestion by Kenny and Rice (1995) and are similar to the results found by Lopez et al. (2001). The results suggest that the relation between attachment anxiety and psychological distress is not simply a direct linear relationship; rather, perceived coping plays an important mediating role in psychological distress.

Similarly, the results indicate that perceived coping partially mediates the relations between attachment avoidance and psychological distress. Specifically, these results suggest that attachment avoidance has both a direct effect on indices of psychological distress and an indirect effect through perceived coping. We suspect that the impact of attachment avoidance on psychological distress is more complex than that of attachment anxiety and may involve a number of other third variables or nonlinear processes (see Heppner & Krauskopf, 1987, for related discussions). We suggest that future researchers examine other third variables besides perceived coping that might serve as mediators between attachment avoidance and psychological distress.

In addition, Lopez et al. (2001, 2002) reported that attachment avoidance failed to significantly predict distress after attachment anxiety was controlled for. These findings are consistent with observations that persons with attachment avoidance tend not to acknowledge their distress (Collins, 1996). However, in the present study, both attachment anxiety and attachment avoidance uniquely predict psychological distress ($prs = .38$ and $.39$, $ps < .001$) even after we controlled for the respective other attachment dimension. One possible reason for this inconsistency is that people with attachment avoidance may not report distress on simple measures with high face validity but may be more likely to report distress in the multivariate battery of indicators administered in this study. Also, structural equation modeling used in the present study is more capable of isolating measurement error than the regression methods used in other studies. The results of this study may be due to the increased power, stronger statistical analyses, and stronger conceptualization and measurement of both coping and psychological distress.

Previous research indicates that people with avoidant and anxious attachment rely on less constructive ways of coping than those relied on by secure persons (Mikulincer & Florian, 1995; Mikulincer et al., 1993). Several of the previous studies that linked attachment and coping have used situational coping assessments (e.g., the Ways of Coping Scale; Folkman & Lazarus, 1988). The present study adds additional information about the link between attachment and coping by focusing on dispositional measures of problem solving or coping (e.g., the PSI); the results confirmed that adult attachment is associated with stable ways in which people appraise and cope with distress (Bowlby, 1988; Mikulincer & Florian, 1998). The results suggest that persons with anxious and avoidant attachment appraise their coping capabilities across problems in general as more ineffective; these results are similar to the results found by Lopez et al. (2001). Thus, adult attachment is related not only to situational styles of coping (e.g., Mikulincer & Florian, 1995) in the previous literature but also to more stable and dispositional styles of coping. Given the strong association between attachment and perceived coping found in this study, it may be helpful to increase a person's coping effectiveness in order to decrease his or her distress.

Clients typically seek counseling because they have problems that they have been unable to resolve. The results of this study (both the zero-order correlations and the structural equation models) suggest possible therapeutic interventions. The strong association between attachment and perceived coping found in this study may imply that clients could first be helped to make connections related to how their attachment patterns may be associated with inadequate coping patterns. Although brief therapy is not likely to offer most clients an adequate opportunity to alter their basic attachment patterns, it may well be possible to help clients in brief therapy to gain more effective ways of coping with the distress that arises from their particular adult experiences of attachment (Mallinckrodt, 2000, 2001). For example, for persons with avoidant attachment, a practitioner might help them to understand that they expect others to be unresponsive and that they may have protected themselves against others' rejection through an ineffective way of coping, which in turn contributes to their psychological distress. Our results suggest such individuals might be helped if they could gain higher levels of perceived coping effectiveness.

Bowlby (1988) acknowledged that attachment patterns are difficult, though not impossible, to change in adulthood. Within the confines of the limited number of sessions often dictated by managed care, practitioners tend to focus on brief therapeutic interventions. Research has indicated that focused training can substantially enhance participants' coping styles (Heppner & Hillerbrand, 1991). Enhancing clients' coping styles is likely to be much easier than changing clients' attachment in brief therapy. For example, Heppner and Baker (1997) suggested that inventories such as the PSI (one of the coping assessments in this study) could enhance brief therapy by being an assessment and intervention planning tool to quickly provide information about clients' coping or problem-solving styles that may hinder their daily functioning. Clients with anxious attachment often need to continue to get others' reassurance to maintain self-esteem; at the beginning, therapists may provide frequent reassurance to them. However, their needs for reassurance may occur repeatedly, perhaps because of an association with a lack of coping effectiveness. Thus, it may be helpful for therapists to increase anxious clients' awareness of their perceived ineffective coping (see Heppner & Reeder, 1984) in order to lessen their psychological distress. It is also important to note that our samples were college students and not clinical populations. The above possible intervention still requires future psychotherapy outcome research with clinical populations to examine interventions designed to enhance coping effectiveness and subsequently decrease psychological distress. Even though practitioners may attempt to enhance their clients' coping effectiveness through the course of psychotherapy, it would be useful to collect empirical data evaluating such counseling intervention.

There are a number of limitations to the study that are important to note. Although the results are based on a more complex model than previously used in the literature, the results of structural equation modeling are based on correlational data. It is not possible to draw any firm conclusions about the causal relationships among these variables. In the future, researchers might conduct psychotherapy outcome research by examining whether the interventions of increasing one's coping effectiveness can decrease the psychological distress of clients with different attachment dimensions. Also, the participants in the present study were predominantly White college students enrolled in undergraduate classes. It is important not to generalize the findings to other populations,

such as clinical or other racial-ethnic populations. Further research is needed to replicate the present study in other populations. Because this study relied on self-report measures, it is possible that response bias, mood effects, and monomethod bias affected the results. For example, persons with anxious attachment would be likely to view their attachment negatively, their coping as ineffective, and their distress as high. The result of a negative bias possibly presents a potential confound. Although multiple measures of coping and psychological distress were used, only one attachment measure was used in the present study. Future research might use multiple attachment measures to create latent variables to operationalize attachment anxiety and attachment avoidance. Moreover, further research is needed to continue to explore other mediators (e.g., perfectionism or self-empowerment) between attachment and psychological distress.

In conclusion, in the present study we empirically examined the mediational role of perceived coping in the relations between attachment and psychological distress indices by using structural equation modeling. The results suggest the relations between attachment and psychological distress indices are not simply a direct linear relationship as previously hypothesized; rather, perceived coping seems to serve as another mechanism through which attachment affects psychological distress. The results expanded the notion of attachment to explicitly include the way people cope with stressful problems. The results support Kenny and Rice's (1995) call to examine the process of how attachment is associated with psychological distress, in order to provide more specific suggestions for counseling interventions. Clearly, the results strongly suggest that it may be helpful for people with either anxious or avoidant attachment to enhance their coping effectiveness to decrease psychological distress, even though inadequate attachment contributes to their distress. These encouraging findings suggest specific counseling implications in the climate of brief therapy and clients' desire for quick resolution of their problems.

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