Maladaptive Perfectionism and Ineffective Coping as Mediators Between Attachment and Future Depression: A Prospective Analysis

Meifen Wei
Iowa State University

P. Paul Heppner
University of Missouri—Columbia

Daniel W. Russell and Shannon K. Young
Iowa State University

This study used a longitudinal design to examine whether maladaptive perfectionism and ineffective coping served as 2 mediators of the relation between adult attachment and future depression. Data were collected from 372 undergraduates at 2 time points. Results indicated that (a) the impact of attachment on future depression was mediated through future maladaptive perfectionism and ineffective coping, (b) ineffective coping mediated the relation between maladaptive perfectionism and depression, and (c) maladaptive perfectionism and ineffective coping influenced each other at 1 point in time and across time, and, in turn, both variables contributed to depression. A bootstrap procedure was used to estimate the significance of these indirect effects. About 60% of the variance in future depression was explained in the final model. Future research, counseling implications, and limitations of the present study are discussed.

Keywords: adult attachment, maladaptive perfectionism, ineffective coping, depression, longitudinal study

Over the past decade, counseling psychologists have become interested in the application of attachment theory to understand the adult development and counseling process (Lopez, 1995; Lopez & Brennan, 2000; Mallinckrodt, 2000). There appears to be a consensus that adult attachment can be viewed in terms of two dimensions, attachment anxiety and attachment avoidance (e.g., Brennan, Clark, & Shaver, 1998). Brennan et al. (1998) administered all of the extant self-report measures of adult attachment (a total of 323 items) to over 1,000 college students, identifying two relatively orthogonal dimensions that they labeled *anxiety* and *avoidance*. Adult attachment anxiety is defined as the fear of interpersonal rejection or abandonment, whereas adult attachment avoidance taps the fear of interpersonal closeness or dependence. Individuals who are high on either or both dimensions are assumed to have an insecure adult attachment orientation.

A growing body of research has suggested a strong relation between adult attachment (i.e., anxiety and avoidance) and depressive symptoms (e.g., Besser & Priel, 2003; Carnelley, Pietromonaco, & Jaffe, 1994; Roberts, Gotlib, & Kassel, 1996; Wei, Heppner, & Mallinckrodt, 2003; Wei, Mallinckrodt, Russell, & Abraham, 2004). On the basis of this relation, it appears that one way to help people with high levels of attachment anxiety and/or avoidance decrease their feelings of depression is to alter their fundamental attachment patterns. However, even though it is not impossible, attachment patterns are difficult to change because of the continuity of attachment-related behaviors from childhood to adulthood (Bowlby, 1973, 1980, 1988). Another strategy is to examine the mediating effects of other variables on the relation between attachment and depression or distress. Empirical studies of mediation provide one possible method for psychologists to develop workable clinical interventions (e.g., increasing effective coping; see Wei et al., 2003) instead of attempting to alter fundamental attachment patterns for individuals with high levels of attachment anxiety and/or avoidance.

Researchers have identified several possible mediators of the relation between adult attachment and depression or distress. These mediators include low self-esteem (Roberts et al., 1996), problem-solving/coping styles or perceived coping effectiveness (Lopez, Mauricio, Gormley, Simko, & Berger, 2001; Wei et al., 2003), self-splitting and self-concealment (Lopez, Mitchell, & Gormley, 2002), social self-efficacy and emotional awareness (Mallinckrodt & Wei, 2005), maladaptive perfectionism (Wei et al., 2004), and emotional reactivity (i.e., finding it difficult to remain calm when experiencing intense emotions) or emotional cutoff or closure (i.e., pulling away when one is experiencing intense emotions; Wei, Vogel, Ku, & Zakalik, 2005). One limitation of these studies is the use of cross-sectional research designs in which all of the measures were assessed at the same point in time, which limits our ability to draw causal inferences from the

findings. One study (Roberts et al., 1996) attempted to collect longitudinal data at two different time points. Findings from studies using prospective designs would contribute to a better understanding of the causal relations among measures of attachment, proposed mediating variables, and consequences such as depression or distress. In the present study, we are interested in exploring two potential mediators, maladaptive perfectionism and ineffective coping, in the context of a longitudinal study.

Attachment, Ineffective Coping, and Depression

According to attachment theory, people with high levels of attachment anxiety tend to use a *hyperactivating* strategy, in which they overreact to their negative feelings to elicit support from others to ensure the availability of those others. Conversely, people with high levels of attachment avoidance tend to use a *deactivating* strategy, in which they suppress their negative feelings and maximize their distance from others to avoid frustration caused by others' unavailability (e.g., Cassidy, 1994, 2000; Cassidy & Kobak, 1988; Lopez & Brennan, 2000; Mikulincer, Shaver, & Pereg, 2003; Pietromonaco & Feldman Barrett, 2000; Shaver & Mikulincer, 2002). A review of the empirical studies on attachment and coping strategies reveals that some research has supported the theory that individuals with high levels of attachment anxiety and/or avoidance use distinct strategies. For example, Wei et al. (2005) found that attachment anxiety contributed to negative mood (i.e., depression and anxiety) through emotional reactivity (but not emotional cutoff); by contrast, attachment avoidance contributed to negative mood through emotional cutoff (but not emotional reactivity). Other studies have not shown that individuals with high levels of attachment anxiety use distinct coping strategies in contrast with individuals with high levels of attachment avoidance. Instead, these studies have indicated that both groups of individuals use either a reactive or a suppressive style of coping or both (e.g., Lopez et al., 2001, 2002; Wei et al., 2003). Thus, although research supports both common and distinct coping patterns across attachment dimensions, it is clear that individuals with high attachment anxiety and/or attachment avoidance tend to use ineffective coping strategies to deal with stress, which may, in turn, increase their feelings of distress.

Besides the association between attachment and ineffective coping, a growing body of research suggests a positive relation between ineffective coping and depression (for a review, see Heppner, Witty, & Dixon, 2004). These results suggest that when people do not think they can effectively cope with problems, they are likely to become depressed. From the above literature, it is clear that there are relations among attachment, ineffective coping, and depression. In other words, persons with a high level of attachment anxiety and/or attachment avoidance tend to use ineffective coping strategies, which, in turn, increase their level of depression. Wei et al. (2003) examined this pattern and found that ineffective coping served as a mediator between attachment and distress for a sample of college students. However, because these analyses were based on concurrent measures, it is not possible to draw any firm conclusions about the causal relations among these variables.

Attachment, Maladaptive Perfectionism, Ineffective Coping, and Depression

There are only a few published studies examining adult attachment and maladaptive perfectionism. Perfectionism is viewed as a multidimensional construct, including adaptive and maladaptive perfectionism (Flett & Hewitt, 2002). Adaptive perfectionism includes a realistic high personal standard, order and organization, or a desire to excel (Enns & Cox, 2002). Conversely, maladaptive perfectionism includes having unrealistically high standards, being overconcerned with mistakes, or perceiving a discrepancy between performance and personal standards (Enns & Cox, 2002). Rice and Mirzadeh (2000) reported that maladaptive perfectionism was related to insecure attachment among college students, whereas adaptive perfectionism was related to secure attachment. Similarly, Andersson and Perris (2000) found that perfectionism was positively associated with insecure attachment. Moreover, it has been well documented that maladaptive perfectionism is positively associated with depression (e.g., Chang, 2002; Chang & Sanna, 2001; Cheng, 2001; Hewitt & Flett, 1991). In longitudinal studies, perfectionism has also been linked to depression over time (Chang & Rand, 2000; Flett, Hewitt, Blankstein, & Mosher, 1995). Because there are direct relations between attachment and maladaptive perfectionism as well as between maladaptive perfectionism and depression, it is possible that adults with high levels of attachment anxiety and/or avoidance develop maladaptive perfectionism, which, in turn, leads to depression. Empirically, Wei et al. (2004) found that maladaptive perfectionism played a mediating role in the relation between attachment and depressive mood for college students.

In addition to maladaptive perfectionism as a mediator between attachment and depression, some studies have also shown that ineffective coping serves as a mediator between maladaptive perfectionism and depression in college student populations. For example, Dunkley, Blankstein, Halsall, Williams, and Winkworth (2000) found that the association between maladaptive perfectionism and a composite measure of depression and anxiety was mediated by avoidant coping, stress (daily hassles), and perceived social support in a college student sample. Dunkley, Zuroff, and Blankstein (2003) expanded on the Dunkley et al. (2000) model and found that there were mediating roles for avoidant coping, daily hassles, and event stress in the relation between maladaptive perfectionism and negative affect (measured by the Positive and Negative Affect Schedule; Watson, Clark, & Tellegen, 1988) for college students. Conversely, Rice and Lapsley (2001) failed to find that dysfunctional coping served as a mediator between perfectionism and emotional adjustment in a college student population. Instead, they found that perfectionism served as a mediator between dysfunctional coping and emotional adjustment. Thus, previous findings are mixed regarding the roles of maladaptive perfectionism and ineffective coping as mediators of the effects of one another on depression.

On a logical basis, however, it appears more likely that ineffective coping would serve as a mediator between maladaptive perfectionism and depression rather than that maladaptive perfectionism would serve as a mediator between ineffective coping and depression. The reason is that perfectionism is viewed in the literature as a relatively stable personality variable (Cox & Enns, 2003), whereas coping strategies are more likely to be learned.

However, the literature we have cited has yielded mixed findings for college students. Therefore, more empirical research is needed to clarify the nature of the relations among these variables, in particular for the same populations (i.e., college students). To date, findings from at least two studies are consistent with our conceptualization (i.e., that coping serves as a mediator between maladaptive perfectionism and depression; Dunkley et al., 2000, 2003).

Current Study

Research has indicated that, in college student samples, ineffective coping serves as a mediator between attachment and distress (Lopez et al., 2001, 2002; Wei et al., 2003), maladaptive perfectionism serves as a mediator between attachment and depression (Wei et al., 2004), and avoidant coping (an index of ineffective coping) serves as a mediator between maladaptive perfectionism and depression (Dunkley et al., 2000, 2003). On the basis of the results of these studies, it seems possible that the quality of attachment may contribute to the development of maladaptive perfectionism, ineffective coping, and depression among college students (i.e., attachment anxiety or avoidance→ maladaptive perfectionism → ineffective coping → depression). Moreover, it is important to note that the literature exploring potential mediators of the relation between attachment and depression or distress has made almost exclusive use of cross-sectional research designs. Researchers need to use longitudinal studies to adequately examine the relations among attachment at Time 1 and maladaptive perfectionism, ineffective coping, and depression at Time 2 after controlling for maladaptive perfectionism, ineffective coping, and depression at Time 1. In the present study, we collected data at two time points and examined the possible mediating roles of maladaptive perfectionism (Time 2) and ineffective coping (Time 2) in the relation between attachment (Time 1) and depression (Time 2) using a longitudinal design. This allowed us to statistically control for initial levels (Time 1) of maladaptive perfectionism, ineffective coping, and depression.

In the present study, we used a structural equation modeling approach (see Figure 1). The two sets of hypotheses that we examine in the present study were expansions of ideas from the previous literature in this area. Given that previous studies using cross-sectional research designs have found maladaptive perfectionism and ineffective coping to be mediators between attachment and depression, in the present study we hypothesized that (a) maladaptive perfectionism (Time 2) or (b) ineffective coping (Time 2) would be a significant mediator between the initial attachment anxiety or avoidance and future depression (i.e., attachment anxiety or avoidance [Time 1] → maladaptive perfectionism [Time 2] or ineffective coping [Time2] → depression [Time 2]). Next, as discussed above, we believe, on a logical basis, that ineffective coping is more likely to be a mediator between maladaptive perfectionism and depression than the reverse (i.e., maladaptive perfectionism serves as a mediator between ineffective coping and depression). We hypothesized that (a) the impact of the initial level of attachment anxiety or avoidance on future depression would be through maladaptive perfectionism and then ineffective coping (i.e., attachment anxiety or avoidance [Time 1] → maladaptive perfectionism [Time 2] → ineffective coping [Time 2] → depression [Time 2]), (b) the impact of the initial level of attachment anxiety or avoidance on ineffective coping would be through maladaptive perfectionism (i.e., attachment anxiety or
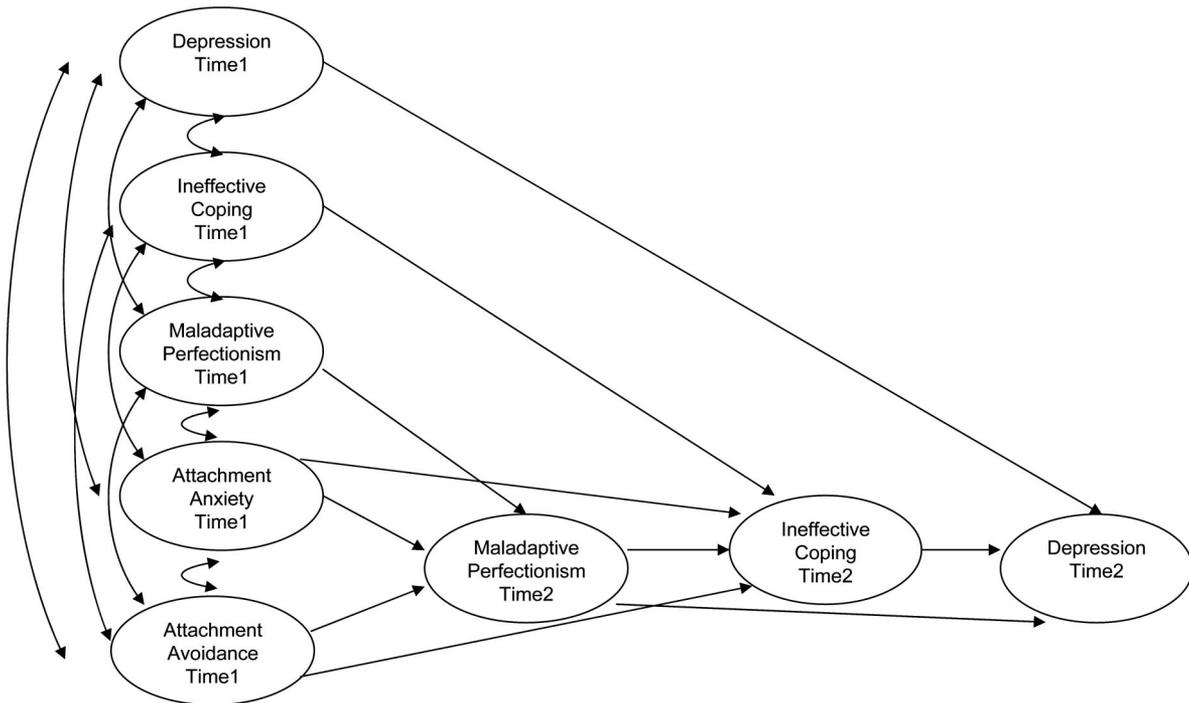

Figure 1. The hypothetical model.

avoidance [Time 1] → maladaptive perfectionism [Time 2] → ineffective coping [Time 2]), and (c) ineffective coping would be a significant mediator between maladaptive perfectionism and depression (i.e., maladaptive perfectionism [Time 2] → ineffective coping [Time 2] → depression [Time 2]). All of the analyses controlled for maladaptive perfectionism, ineffective coping, and depression at Time 1 (see Figure 1) in a college student sample.

Method

Participants

A total of 709 students enrolled in psychology courses at a large midwestern university participated in the Time 1 assessment. Two months later, 372 (53%) students completed the questionnaire at Time 2. Participants were told that the purpose of the study was to understand factors related to college student adjustment. The sample included 219 (59%) women and 153 (41%) men who were between 18 and 26 years of age ($M = 20.01$ years, $SD = 1.07$). The majority of students (96%) were single. Participants indicated their ethnicity as follows: 93% European American, 2.4% Asian American, 1.1% African American, 1.6% Latino American, 0.5% multiracial American, 0.5% international student, 0.3% Native American, and 0.3% other. Approximately 69% and 20% of the participants were freshmen and sophomores, respectively. All participants were volunteers who received research credit toward a course grade for participation in the study.

Measures

Attachment (Time 1). We assessed attachment (anxiety and avoidance) with the Experiences in Close Relationships Scale (ECRS; Brennan et al., 1998). The ECRS is a 36-item self-report measure of adult attachment anxiety and avoidance. The Anxiety subscale assesses fear of rejection and preoccupation with abandonment, whereas the Avoidance subscale measures fear of intimacy and discomfort with getting close to others or dependence. Participants rate how well the statements characterize their usual experiences in romantic relationships. Respondents rate each item on a 7-point Likert-type scale that ranges from 1 (*disagree strongly*) to 7 (*agree strongly*). The score range is from 18 to 126 for each subscale. Higher scores on the Anxiety and Avoidance subscales indicate higher attachment anxiety and attachment avoidance, respectively. It is important to note that the ECRS was developed from all the extant attachment measures (60 subscales and 323 items), so we selected this instrument for use in the current study. Coefficient alphas ranging from .91 to .94 for the Anxiety and Avoidance subscales have been found for the ECRS (e.g., Brennan et al., 1998; Wei et al., 2004). Brennan et al. (1998) also reported that the ECRS was positively correlated with similar theoretical constructs, such as touch and postcoital emotions. Likewise, Wei et al. (2005) found positive correlations between attachment anxiety and emotional reactivity and between attachment avoidance and emotional cutoff. Lopez and Gormley (2002) reported test–retest reliabilities of .68 and .71 over a 6-month interval for the attachment anxiety and attachment avoidance scales, respectively.

Maladaptive perfectionism (Time 1 and Time 2). We measured maladaptive perfectionism with the Discrepancy subscale from the Almost Perfect Scale—Revised (Slaney, Rice, Mobley, Trippi, & Ashby, 2001). The Discrepancy subscale is a 12-item self-report measure designed to assess the degree to which respondents perceive themselves as failing to meet personal performance standards. Slaney et al. (2001) indicated that one could view the Discrepancy subscale as assessing maladaptive perfectionism, whereas one could view the other two subscales (High Standards and Order) as assessing adaptive perfectionism. When answering the items, participants use a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The score range is from 12 to 84, with a higher score indicating a higher degree of maladaptive perfectionism. Coefficient alpha has ranged from .92 (Slaney et al., 2001) to .94 (Wei et al., 2004) for the Discrepancy subscale. In the present study, coefficient alphas were .95 at Time 1 and .96 at Time 2. The validity was supported by the significant correlations between the score on the Discrepancy subscale and the scores on other perfectionism measures, such as Concern Over Mistakes ($r = .55$) and Doubts About Action ($r = .62$) (Slaney et al., 2001).

Ineffective coping (Time 1 and Time 2). We used the Suppressive Style and Reactive Style subscales from the Problem-Focused Style of Coping measure (PF-SOC; Heppner, Cook, Wright, & Johnson, 1995) to assess ineffective coping. The Suppressive Style is a six-item subscale that measures a tendency to deny problems and avoid coping activities. The Reactive Style is a five-item subscale that measures a tendency toward strong emotional responses, distortion, impulsivity, and cognitive confusion (Heppner et al., 1995). Each item uses a 5-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost all of the time*). The score range is from 6 to 30 for the Suppressive Style subscale and from 5 to 25 for the Reactive Style subscale. In the present study, we used the Suppressive Style and Reactive Style subscales as indices of ineffective coping. Higher scores indicate more use of the suppressive and reactive styles of coping. The subscales appear to be reliable, with coefficient alphas of .77 for both (Wei et al., 2003). Coefficient alphas for the Suppressive Style and Reactive Style subscales were .78 and .79, respectively, at Time 1 and .81 and .79, respectively, at Time 2 in the current study. Regarding validity, three recent studies have provided evidence that the PF-SOC is related to psychological distress, depression, and anxiety in predicted ways (Lopez et al., 2001, 2002; Wei et al., 2003).

Depression (Time 1 and Time 2). We used the Center for Epidemiologic Studies–Depression Scale (CES-D; Radloff, 1977) to measure depression. The CES-D is a 20-item scale that assesses current levels of depressive symptoms. Items are rated on a 4-point Likert scale that ranges from 0 (*rarely or none of the time* [*less than 1 day*]) to 3 (*most or all of the time* [*5–7 days*]), on the basis of the frequency with which participants have experienced symptoms during the previous week. Scores range between 0 and 60, with higher scores indicating higher levels of depressive mood and symptoms. A total score of 16 or higher on the CES-D is used as a cutoff score for identifying cases of depression (Boyd, Weissman, Thompson, & Meyers, 1982; Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977). In the present study, the mean for the CES-D was 14.08 for Time 1 ($SD = 8.70$, actual score range $= 0–57$) and 12.97 for Time 2 ($SD = 9.91$, actual score range $= 0–54$). Good internal consistency has been shown, with a coefficient alpha of .85 in a nonclinical sample. In the present study, coefficient alpha was .88 at Time 1 and .91 at Time 2. Convergent validity is supported by the positive correlation ($r = .86$) between the CES-D and the Beck Depression Inventory (Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995).

Creation of Measured Variables

To create three measured indicators for the latent variables of attachment anxiety, attachment avoidance, maladaptive perfectionism, and depression, we followed the recommendation of Russell, Kahn, Spoth, and Altmaier (1998) to create three parcels as indicators of each latent variable (i.e., attachment anxiety Time 1, attachment avoidance Time 1, maladaptive perfectionism Time 1 and Time 2, and depression Time 1 and Time 2). First, we conducted, separately for each scale, exploratory factor analyses using the maximum likelihood method of extraction, with a single factor extracted for each measure. We then rank ordered items on the basis of the absolute magnitude of the factor loadings and successively assigned triads of items, going from the highest to the lowest loadings, to each of the three parcels to equalize the average loadings of each parcel on the respective factor. We then created scores on the three parcels by computing the average score for each set of items. To ensure that the nature of the measures that we assessed repeatedly over time (i.e., maladaptive perfection-

Table 1
Means, Standard Deviations, and Correlations Among the 22 Observed Variables

Variable	M^a	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. D1T1	4.89	3.1	—	.70	.68	.37	.44	.37	.37	.36	.42	.38	.38	.02	.03	.01	.37	.39	.37	.41	.39	.58	.48	.53
2. D2T1	4.83	3.56		—	.71	.31	.40	.36	.36	.32	.41	.40	.39	.02	.01	.01	.38	.40	.38	.35	.37	.50	.58	.53
3. D3T1	4.36	2.98			—	.40	.50	.43	.42	.39	.44	.42	.45	.02	.05	.02	.43	.42	.42	.43	.45	.51	.53	.58
4. SuppT1	13.50	4.30				—	.59	.37	.36	.36	.38	.35	.38	.30	.26	.27	.35	.37	.33	.63	.45	.32	.36	.35
5. ReactT1	12.59	3.98					—	.45	.47	.42	.55	.51	.56	.16	.15	.15	.39	.40	.38	.45	.57	.38	.40	.40
6. MP1T1	14.35	5.25						—	.90	.89	.53	.49	.49	.22	.19	.17	.68	.66	.63	.38	.42	.40	.40	.42
7. MP2T1	14.17	5.52							—	.89	.52	.48	.49	.23	.21	.19	.68	.69	.66	.37	.42	.41	.41	.43
8. MP3T1	13.59	5.69								—	.55	.49	.48	.21	.20	.18	.66	.67	.69	.39	.38	.39	.38	.40
9. Anx1T1	20.88	6.52									—	.80	.81	.17	.15	.16	.48	.47	.46	.38	.43	.34	.37	.42
10. Anx2T1	21.30	7.02										—	.81	.18	.17	.18	.46	.45	.43	.32	.38	.28	.32	.34
11. Anx3T1	21.40	6.90											—	.16	.15	.14	.44	.40	.39	.32	.43	.30	.34	.37
12. Avo1T1	16.56	6.58												—	.84	.84	.27	.26	.26	.25	.16	.08	.11	.08
13. Avo2T1	16.36	6.70													—	.86	.29	.26	.29	.22	.18	.10	.11	.08
14. Avo3T1	16.29	6.47														—	.25	.24	.23	.13	.09	.09	.10	.07
15. MP1T2	13.35	5.47															—	.91	.88	.49	.51	.50	.50	.53
16. MP2T2	13.17	5.55																—	.90	.47	.46	.51	.50	.53
17. MP3T2	12.58	5.48																	—	.45	.46	.52	.49	.52
18. SuppT2	13.37	4.46																		—	.65	.50	.45	.51
19. ReactT2	12.30	3.75																			—	.49	.47	.55
20. D1T2	4.50	3.77																				—	.78	.78
21. D2T2	4.48	3.81																					—	.80
22. D3T2	3.99	3.11																						—

Note. $N = 372$. Absolute correlation values greater than or equal to .10 are significant at $p < .05$; those greater than or equal to .14 are significant at $p < .01$; and those greater than or equal to .18 are significant at $p < .001$. T1 = Time 1; T2 = Time 2; D (depression) 1, 2, 3 = three item parcels from the Center for Epidemiological Studies–Depression Scale; Supp (suppression) and React (reaction) = the Suppressive Style subscale and Reactive Style subscale from the Problem-Focused Style of Coping Scale; MP (maladaptive perfectionism) 1, 2, 3 = three item parcels of the Discrepancy subscale from the Almost Perfect Scale—Revised; Anx (attachment anxiety) 1, 2, 3 = three item parcels from the Anxiety subscale of the Experiences in Close Relationships Scale; Avo (attachment avoidance) 1, 2, 3 = three item parcels from the Avoidance subscale of the Experiences in Close Relationships Scale.
[a] It is important to note that the mean score is the mean for each parcel, not the mean from all the items included in the scale. One can compute the mean for the total items by adding the means from the three parcels together. So, for example, the mean on the CES-D at Time 1 across all the items is 4.89 + 4.83 + 4.36 = 14.08.

ism and depression) was not allowed to change over time, we included the same items in the three parcels at Time 1 and Time 2 for these measures.

Results

Descriptive Statistics

To examine whether participants who completed both the Time 1 and the Time 2 questionnaire were comparable to participants who completed only the Time 1 questionnaire, we conducted comparisons of these two groups of participants in terms of gender, ethnicity, educational level, age, and the five variables (i.e., attachment anxiety, attachment avoidance, maladaptive perfectionism, ineffective coping, and depression) that we measured at Time 1. Because of the number of analyses, we used a Type I error rate of .01 for these analyses. The results indicated that the two groups of participants did not differ significantly in terms of gender, ethnicity, education level, or the five variables that we assessed at Time 1 (all $ps > .01$).

However, the result of an independent sample t test indicated that students who participated only at Time 1 were slightly older ($M = 19.44$ years, $SD = 2.01$) than students who participated at both Time 1 and Time 2 ($M = 19.07$ years, $SD = 1.07$), $t(707) = 3.12, p < .01$. Although this finding was statistically significant, we note that the magnitude of this age difference ($R^2 = .014$) was only slightly larger than the value of .01, which reflects a small effect size on the basis of Cohen's (1988) analysis. Also, age was not significantly associated

with any of the key variables used in the present study (all $ps > .01$). Therefore, it appears unlikely that this difference in age between students with complete data and students who discontinued participation in the study had a biasing effect on the results of the longitudinal modeling analyses reported below.

As an additional test for differences between these two groups of participants, we used a multiple-group comparison to compare them in terms of the factor loadings and correlations among the latent variables in the measurement model for the measures that we assessed at Time 1. We found no significant differences involving either the factor loadings or the correlations among the latent variables ($ps > .01$) for participants with and without complete data. In conclusion, it seems unlikely that the loss of these participants created a bias in the sample in terms of the relations among these five variables.

Table 1 presents the means, standard deviations, and zero-order correlations for the 22 observed variables.[1] To test the normality assumption underlying the maximum likelihood estimation procedure, we used a multivariate normality test to examine whether the data were normally distributed. The results indicated that the data were not multivariate normal, $\chi^2(2, N = 372) = 310.01, p < .001$.

---

[1] The means, standard deviations, and ranges of the variables used in the present study are comparable to those found in previous studies (e.g., Wei et al., 2003, 2004).

Therefore, in all modeling analyses we used the scaled chi-square statistics for adjusting for the impact of nonnormality, developed by Satorra and Bentler (1988).

Method of Testing Indirect Effects

We used the following procedures to test the significance of the hypothesized mediation or indirect effects. First, we tested the measurement model for an acceptable fit to the data through a confirmatory factor analysis (Anderson & Gerbing, 1988). Second, we tested the structural model after we developed an acceptable measurement model. Third, we used a bootstrap procedure to evaluate the significance of the indirect effects. A number of methods have been suggested in the literature for testing indirect effects. MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) evaluated 14 methods in terms of Type I error and statistical power. They found that the commonly used method recommended by Baron and Kenny (1986) for testing mediation had the lowest statistical power. Instead, MacKinnon et al. (2002) found that testing the significance of the indirect effect, as discussed by Sobel (1982, 1988), provided a more powerful test of mediation. However, they also noted problems with the standard error associated with the significance test of the indirect effect that is provided by programs such as LISREL (Joreskog, K. G., & Sorbom, D., 2003). Shrout and Bolger (2002) have suggested a bootstrap procedure (Efron & Tibshirani, 1993) as an empirical method of determining the distribution of parameter estimates to test the significance level of the indirect effects. We used this procedure to test the statistical significance of the indirect effects.

We used the maximum likelihood method in LISREL (Version 8.54) to examine the measurement and structural models. In addition to the scaled chi-square statistic developed by Satorra and Bentler (1988), we used three indexes to assess the goodness of fit of the models (Hu & Bentler, 1999): the comparative fit index (CFI; values of .95 or greater indicate a model that fits the data well), the root-mean-square error of approximation (RMSEA; values of .06 or less indicate a model that fits the data well), and the standardized root-mean-square residual (SRMR; values of .08 or less indicate a model that fits the data well). As noted above, we used the corrected scaled chi-square difference test (Satorra & Bentler, 2001) to compare nested models.

Measurement Model

An initial test of the measurement model resulted in a good fit to the data, scaled $\chi^2(178, N = 372) = 208.15$, $p < .001$, CFI = 1.00, RMSEA = .02 (90% confidence interval [CI]: .00, .03), SRMR = .03.[2] All of the loadings of the 22 measured variables on the latent variables were statistically significant ($p < .001$; see Table 2). It therefore appears that all of the latent variables have been adequately operationalized by their respective measured variables. In addition, as shown in Table 3, the correlations among the latent variables were significant, except for the associations between the initial level of attachment avoidance and the initial and subsequent levels of depression. We therefore used this measurement model when testing the structural model.

Structural Equation Model

We tested the hypothesized structural model (see Figure 1) using the maximum likelihood method in the LISREL 8.54 pro-

gram. The results indicated that the hypothesized structural model (see Figure 2) provided a very good fit to the data, scaled $\chi^2(186, N = 372) = 240.58$, $p < .001$, CFI = 1.00, RMSEA = .03 (90% CI: .02, .04), SRMR = .04. Approximately 58% of the variance in maladaptive perfectionism (Time 2) was explained by attachment anxiety, attachment avoidance, and maladaptive perfectionism at Time 1; 60% of the variance in ineffective coping (Time 2) was explained by maladaptive perfectionism (Time 2) and ineffective coping (Time 1); and 60% of the variance in depression (Time 2) was explained by maladaptive perfectionism (Time 2), ineffective coping (Time 2), and depression (Time 1). Also, as we can see in Figure 2, all the structural paths were significant except the paths from attachment anxiety and avoidance (Time 1) to ineffective coping (Time 2) (βs = $-.05$ and $-.03$, respectively, ps > .05). To test the significance of the indirect effects, we used this hypothetical structural model in the bootstrap procedure described below.

Testing the Significance of the Indirect Effects

There are several steps in the bootstrap procedure.[3] First, we created 1,000 bootstrap samples ($n = 372$) from the original data by random sampling with replacement. Second, we tested the hypothesized structural equation model 1,000 times with these bootstrap samples using the LISREL program, which yielded 1,000 estimates of each path coefficient. Third, output from the 1,000 estimates of each path coefficient provided estimates of the first set of four indirect effects (i.e., the first, second, third, and fourth indirect effects in Table 4) via multiplication of 1,000 sets of path coefficients from (a) attachment anxiety or avoidance (Time 1) to maladaptive perfectionism (Time 2) or ineffective coping (Time 2) and (b) maladaptive perfectionism (Time 2) or

---

[2] To ensure that the nature of the constructs that we assessed repeatedly (i.e., maladaptive perfectionism, ineffective coping, and depression) was the same over time, we constrained the factor loadings of the measured indicators from the first and second assessments to be identical. Also, to control for possible systematic error due to the repeated assessment of these variables at Times 1 and 2, we allowed the measurement error among the identical measures of the three constructs to be correlated over time. So, for example, we allowed the measurement error for the first measured indicator of depression from Time 1 to correlate with the measurement error for the same first measured indicator of depression at Time 2. We also did this for the second and third measured indicators of depression from Times 1 and 2. We also included correlated error for the measured indicators of the other two longitudinal variables (i.e., maladaptive perfectionism and ineffective coping).

[3] An example may help to illustrate this procedure. Imagine a simple mediation model, such as the following: A→ B → C. One computes the indirect effect of variable A on variable C through B by multiplying the path from A to B by the path from B to C. Thus, the indirect effect is based on the product of two unstandardized beta weights or path coefficients (i.e., $b_{AB} \times b_{BC}$). As a consequence, the sampling distribution of the indirect effect is not symmetrical (see discussion by MacKinnon et al., 2002; Shrout & Bolger, 2002). Use of the bootstrap procedure allows us to develop an empirical specification of the sampling distribution, without the requirement that the sampling distribution of the indirect effect be symmetrical. By conducting analyses of the indirect effect from A to C on the 1,000 samples that are generated by the bootstrap procedure, we end up with an empirical specification of the sampling distribution of the indirect effect, which, in turn, provides a test of whether the indirect effect is significantly different from zero.

Table 2
Factor Loadings for the Measurement Model

Measure and variable	Unstandardized factor loading	SE	t [a]	Standardized factor loading
Depression Time 1				
Depression Parcel 1 Time 1	1.00[b]			.84[b]
Depression Parcel 2 Time 1	1.06	0.04	24.73	.83***
Depression Parcel 3 Time 1	0.89	0.04	24.29	.84***
Ineffective coping Time 1				
Suppressive style Time 1	1.00[b]			.73[b]
Reactive style Time 1	0.99	0.06	15.70	.82***
Maladaptive perfectionism Time 1				
Perfectionism Parcel 1 Time 1	1.00[b]			.93[b]
Perfectionism Parcel 2 Time 1	1.06	0.02	56.21	.96***
Perfectionism Parcel 3 Time 1	1.03	0.02	49.11	.92***
Attachment anxiety Time 1				
Anxiety Parcel 1 Time 1	1.00[b]			.90[b]
Anxiety Parcel 2 Time 1	1.06	0.04	25.60	.89***
Anxiety Parcel 3 Time 1	1.06	0.04	27.82	.90***
Attachment avoidance Time 1				
Avoidance Parcel 1 Time 1	1.00[b]			.91[b]
Avoidance Parcel 2 Time 1	1.03	0.04	28.37	.92***
Avoidance Parcel 3 Time 1	1.00	0.03	29.19	.93***
Maladaptive perfectionism Time 2				
Perfectionism Parcel 1 Time 2	1.00[b]			.94[b]
Perfectionism Parcel 2 Time 2	1.06	0.02	56.21	.96***
Perfectionism Parcel 3 Time 2	1.03	0.02	49.11	.94***
Ineffective coping Time 2				
Suppressive style Time 2	1.00[b]			.75[b]
Reactive style Time 2	0.99	0.06	15.70	.85***
Depression Time 2				
Depression Parcel 1 Time 2	1.00[b]			.87[b]
Depression Parcel 2 Time 2	1.06	0.04	24.73	.89***
Depression Parcel 3 Time 2	0.89	0.04	24.29	.91***

Note. $N = 372$.
[a] The t values are distributed as a Z statistic. Therefore, absolute values of 1.96 or greater are statistically significant, $p < .05$, two-tailed test. [b] These loadings were fixed to 1.00 so that the measurement model would be identified (i.e., to provide a scale of measurement for the factor loadings). Therefore, no significance test is reported for these loadings.
*** $p < .001$.

ineffective coping (Time 2) to depression (Time 2). Similarly, output from the 1,000 estimates of each path coefficient yielded estimates of the second set of two indirect effects (i.e., the fifth and sixth indirect effects in Table 4) via multiplication of the 1,000 sets of path coefficients from (a) attachment anxiety or avoidance (Time 1) to maladaptive perfectionism (Time 2), (b) maladaptive perfectionism (Time 2) to ineffective coping (Time 2), and (c) ineffective coping (Time 2) to depression (Time 2). Finally, output from the 1,000 estimations of each path coefficient yielded estimates of the second set of the other three indirect effects (i.e., the seventh, eighth, and ninth indirect effects in Table 4) via multiplication of the 1,000 sets of path coefficients from (a) attachment anxiety or avoidance (Time 1) to maladaptive perfectionism (Time 2) and (b) maladaptive perfectionism (Time 2) to ineffective coping (Time 2) as well as (a) maladaptive perfectionism (Time 2) to ineffective coping (Time 2) and (b) ineffective coping (Time 2) to depression (Time 2). If the 95% CI for these nine estimates of indirect effects does not include zero, we can conclude that the indirect effect is statistically significant at the .05 level (Shrout & Bolger, 2002).

In Table 4, we can see that 95% CIs for all nine of the indirect effects did not include zero, with two exceptions. These results indicate that all of the hypothesized indirect effects were statistically significant except for the indirect effects from attachment anxiety and avoidance (Time 1) through ineffective coping (Time 2) to depression (Time 2). Therefore, the results of the present study support most of the hypotheses (see Figure 2). That is, the initial levels of attachment anxiety and avoidance predicted future depression through (a) future maladaptive perfectionism only and (b) future maladaptive perfectionism first and then future ineffective coping. Also, the initial levels of attachment anxiety and avoidance predicted future ineffective coping through future maladaptive perfectionism. Finally, ineffective coping (Time 2) served as a mediator between maladaptive perfectionism (Time 2) and depression (Time 2). However, the present results do not support the prediction that the initial levels of attachment anxiety and avoidance predicted future depression through future ineffective coping.

Additional Analyses

Our results indicate that maladaptive coping serves as a mediator between perfectionism and depression. However, Rice and

WEI, HEPPNER, RUSSELL, AND YOUNG

Table 3
Correlations Among the Latent Variables on the Basis of the Measurement Model

Latent variable	1	2	3	4	5	6	7	8
1. Depression Time 1	—	.62***	.48***	.55***	.03	.50***	.59***	.69***
2. Ineffective coping Time 1		—	.56***	.67***	.27***	.50***	.72***	.53***
3. Maladaptive perfectionism Time 1			—	.59***	.23***	.74***	.52***	.49***
4. Attachment anxiety Time 1				—	.19**	.51***	.54***	.43***
5. Attachment avoidance Time 1					—	.30***	.23**	.11
6. Maladaptive perfectionism Time 2						—	.61***	.61***
7. Ineffective coping Time 2							—	.69***
8. Depression Time 2								—

Note. $N = 372$.
** $p < .01$.   *** $p < .001$.

Lapsley (2001) found that perfectionism served as a mediator between dysfunctional coping and emotional adjustment. To clarify these inconsistent findings, we tested two additional models. The first model reversed the order of maladaptive perfectionism (Time 2) and ineffective coping (Time 2) from the model shown in Figures 1 and 2. The second model allowed maladaptive perfectionism (Time 2) and ineffective coping (Time 2) simply to be correlated with one another. The results indicate that these two alternative models were comparable to our structural model in terms of their fit to the data.[4] Similar to our model (see Figure 2), the paths from attachment anxiety and avoidance (Time 1) to ineffective coping (Time 2) were not statistically significant ($ps >$ .05) in these two alternative models.

Because we measured maladaptive perfectionism and ineffective coping at the same time point (Time 2) in the present study, the question of whether maladaptive perfectionism causes ineffective coping, ineffective coping causes maladaptive perfectionism, or maladaptive perfectionism and ineffective coping are simply correlated with one another remained unanswered. We conducted two additional analyses to address this question. First, we tested a cross-lagged panel model to see (a) whether maladaptive perfectionism (Time 1) would significantly predict ineffective coping (Time 2) and, in turn, predict depression (Time 2) and (b) whether ineffective coping (Time 1) would significantly predict maladaptive perfectionism (Time 2) and, in turn, predict depression (Time 2). This cross-lagged panel model analysis controlled for depression at Time 1 (see Figure 3). The results indicated that maladaptive perfectionism (Time 1) significantly predicted ineffective coping (Time 2) and that ineffective coping (Time 1) significantly predicted maladaptive perfectionism (Time 2). In addition, both maladaptive perfectionism (Time 2) and ineffective coping (Time 2) significantly predicted depression (Time 2). These results imply that maladaptive perfectionism (Time 1) caused ineffective coping (Time 2), that ineffective coping (Time 1) caused maladaptive perfectionism (Time 2), and that the Time 2 levels of both variables (i.e., maladaptive perfectionism and ineffective coping) contributed to Time 2 depression after we controlled for the initial level of depression.[5] To see whether maladaptive perfectionism and ineffective coping caused each other at the same time point (i.e., Time 2), we next added a reciprocal path from ineffective coping (Time 2) to maladaptive perfectionism (Time 2) in the structural model (see Figure 2). The results indicated that the path from maladaptive perfectionism (Time 2) to ineffective coping

(Time 2) was statistically significant ($\beta = .22, p < .01$), as was the path from ineffective coping (Time 2) to maladaptive perfectionism (Time 2; $\beta = .17, p < .05$). This result implies that maladaptive perfectionism (Time 2) and ineffective coping (Time 2) impacted each other at the same time point (i.e., Time 2) and, in turn, contributed to depression (Time 2).

Discussion

The results of this study expand on previous research in several important ways. First, a previous study using a cross-sectional research design has indicated that maladaptive perfectionism serves as a mediator between attachment and depressive mood (Wei et al., 2004). The present study used a longitudinal design to better understand how the quality of the current level of attachment impacts on the development of future depression through the hypothesized mediating variables (i.e., maladaptive perfectionism tendency and/or the likelihood of using ineffective coping in the future). Our results suggest that the initial level of attachment anxiety and avoidance influenced the development of future depression through future maladaptive perfectionism tendencies, even after we controlled for the initial levels of maladaptive perfectionism, ineffective coping, and depression. This result not only is consistent with our previous cross-sectional results (Wei et al., 2004) but also provides robust evidence for the mediating roles of the maladaptive perfectionism tendency in the association between the quality of attachment and future depression.

However, the present results suggest additional complexity in the prediction that the current levels of attachment anxiety and

---

[4] The fit indices for the first alternative model (maladaptive perfectionism [Time 2] and ineffective coping [Time 2] in reverse order) were as follows: scaled $\chi^2(186, N = 372) = 245.18, p < .001$, CFI = 1.00, RMSEA = .029 (90% CI: .018, .039), SRMR = .041. The fit indices for the second alternative model (maladaptive perfectionism [Time 2] and ineffective coping [Time 2] were allowed to be correlated) were as follows: scaled $\chi^2(186, N = 372) = 244.40, p < .001$, CFI = 1.00, RMSEA = .029 (90% CI: .018, .039), SRMR = .047.

[5] We also tested this cross-lagged panel model controlling for attachment anxiety, attachment avoidance, and depression at Time 1. The patterns of the results (i.e., maladaptive perfectionism [Time 1] significantly predicted ineffective coping [Time 2] and ineffective coping [Time 1] significantly predicted maladaptive perfectionism [Time 2]) were unchanged.
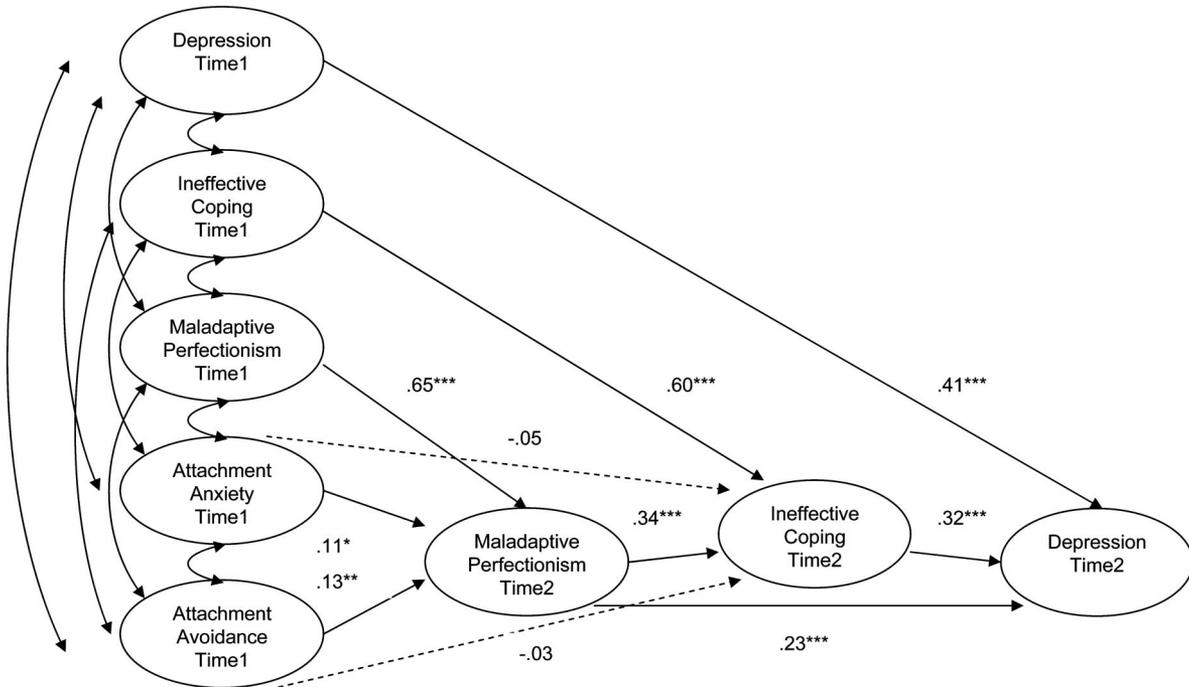
Figure 2. The structural model. $N = 372$. Correlations among the variables (Time 1) are the same as the correlations in Table 3. * $p < .05$. ** $p < .01$. *** $p < .001$.

avoidance would significantly influence the likelihood that an individual would use ineffective ways of coping in the future, which, in turn, contributes to future depression. Previous research has suggested that the quality of attachment contributes to ineffective ways of coping and, in turn, psychological distress at the same time point (Lopez et al., 2001, 2002; Wei et al., 2003, 2005). Instead, the present results suggest that the current levels of attachment anxiety and avoidance impact on maladaptive perfectionism tendencies, which, in turn, lead to the use of ineffective ways of coping. Several attachment researchers and theorists have argued that individuals with high levels of attachment anxiety and avoidance tend to use ineffective strategies to deal with distress

(e.g., Cassidy, 1994, 2000; Cassidy & Kobak, 1988; Lopez & Brennan, 2000; Mikulincer et al., 2003; Pietromonaco & Feldman Barrett, 2000; Shaver & Mikulincer, 2002). The present findings seem to expand the relation between the quality of attachment and future depression into a more complex model than the previous attachment literature has suggested. From the present results, it appears that the current levels of attachment anxiety and avoidance do not directly influence the likelihood that a person will use ineffective ways of coping in the future. Instead, the current levels of attachment anxiety and avoidance appear to influence the tendency toward maladaptive perfectionism in the future, and, in turn, the increased levels of maladaptive perfectionism contribute to the

Table 4

Bootstrap Analysis of Magnitude and Statistical Significance of Indirect Effects

Indirect effect	β (standardized path coefficient and product)	Mean indirect effect (b)[a]	SE[a]	95% CI for mean indirect effect[a]
1. Attachment anxiety T1 → MP T2 → depression T2	$(.11) \times (.23) = .025$	.01316	.00034	.00102, .03001
2. Attachment avoidance T1 → MP T2 → depression T2	$(.13) \times (.23) = .030$	.01481	.00019	.00466, .02884
3. Attachment anxiety T1 → IC T2 → depression T2	$(-.05) \times (.32) = -.016$	−.01023	.00047	−.04349, .01489
4. Attachment avoidance T1 → IC T2 → depression T2	$(-.03) \times (.32) = -.010$	−.00511	.00027	−.02432, .01159
5. Attachment anxiety T1 → MP T2 → IC T2 → depression T2	$(.11) \times (.34) \times (.32) = .012$	.00600	.00020	.00032, .01511
6. Attachment avoidance T1 → MP T2 → IC T2 → depression T2	$(.13) \times (.34) \times (.32) = .014$	.00707	.00011	.00211, .01507
7. Attachment anxiety T1 → MP T2 → IC T2	$(.11) \times (.34) = .037$	.01960	.00057	.00121, .04156
8. Attachment avoidance T1 → MP T2 → IC T2	$(.13) \times (.34) = .044$	.02282	.00027	.00825, .04151
9. MP T2 → IC T2 → depression T2	$(.34) \times (.32) = .109$	.06713	.00067	.03128, .11177

Note. $N = 372$. CI = confidence interval; T1 = Time 1; T2 = Time 2; MP = maladaptive perfectionism; IC = ineffective coping; b = unstandardized beta.

[a] These values are based on the unstandardized path coefficients.
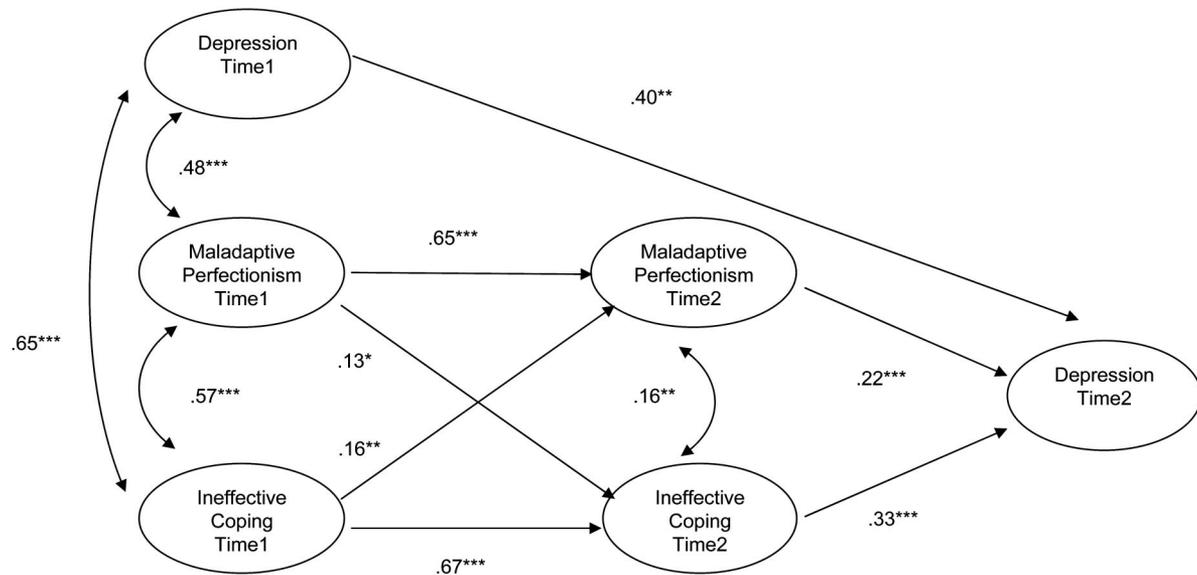
Figure 3. The cross-lagged panel model. $N = 372$. * $p < .05$. ** $p < .01$. *** $p < .001$.

likelihood that a person will use ineffective coping to deal with distress.

In addition to the above contribution to the literature, the present results further clarify the inconsistent findings in the literature in terms of whether ineffective coping is a mediator between maladaptive perfectionism and depression (Dunkley et al., 2000, 2003) or maladaptive perfectionism is a mediator between ineffective coping and depression (Rice & Lapsley, 2001). The present results indicate that maladaptive perfectionism and ineffective coping both influenced one another over time (from Time 1 to Time 2) and at the same time point (Time 2) and that both variables, in turn, then contributed to depression (Time 2), even after we controlled for the initial level of depression. In essence, it is important to understand that maladaptive perfectionism and ineffective coping influenced each other over time and that this combined covariation led to depression in college students. Results from this longitudinal design also provide stronger empirical evidence regarding the complex mediating role of maladaptive perfectionism and ineffective coping in the relation between attachment and future depression.

Moreover, it is interesting to note that the associations between attachment anxiety and maladaptive perfectionism or ineffective coping (rs = .59 and .67, respectively, Time 1; rs = .52 and .54, respectively, Time 2) were consistently stronger than the associations between attachment avoidance and maladaptive perfectionism or ineffective coping (rs = .23 and .27, respectively, Time1; rs = .30 and .23, respectively, Time 2; see Table 3). After we controlled for the initial levels of maladaptive perfectionism, ineffective coping, and the other attachment dimension, attachment anxiety and avoidance still significantly influenced maladaptive perfectionism in the future (βs = .11 and .13, respectively). However, attachment anxiety and avoidance no longer significantly impacted the use of ineffective coping in the future after we controlled for these variables (βs = .05 and .03, respectively).

In addition, the present results indicate that ineffective coping was a mediator between maladaptive perfectionism and depres-

sion. This result is consistent with Dunkley et al.'s (2000, 2003) research, which also found that avoidant coping was a mediator between maladaptive perfectionism and negative affect. Our results indicate that ineffective coping served as a mediator between maladaptive perfectionism and depression even after we controlled for the initial levels of attachment, maladaptive perfectionism, ineffective coping, and depression. Moreover, maladaptive perfectionism directly contributed to depression beyond the indirect effect through ineffective coping (see Figure 2). On the one hand, this result supports previous research, indicating that maladaptive perfectionism is significantly associated with depression (e.g., Wei et al., 2004). On the other hand, this result suggests there may be other variables beyond ineffective coping that mediate the relation between maladaptive perfectionism and depression.

Future Research Directions

Discovering what works best for specific individuals is important for psychologists. For example, Wei et al. (2005) found that emotional reactivity (a hyperactivation strategy) was a mediator in the relation among attachment anxiety, negative mood, and interpersonal problems, whereas emotional cutoff (a deactivation strategy) was a mediator in the relation among attachment avoidance, negative mood, and interpersonal problems. Instead of examining a general indicator of psychological adjustment, future researchers should consider evaluating more specific indicators of psychological problems. For example, given that eating disorders have been linked to attachment (Ward, Ramsay, & Treasure, 2000), perfectionism (Joiner, Heatherton, Rudd, & Schmidt, 1997; Vohs, Bardone, Joiner, & Abramson, 1999), and coping (Etringer, Altmaier, & Bowers, 1989; Soukup, Beiler, & Terrell, 1990), researchers may want to examine the utility of this model to predict eating problems. If the present model is predictive of eating disorders, researchers will then be in a position to examine whether situation-specific ways of coping also mediate the relation between attachment and symptoms of eating disorders. In this manner, research-

ers can examine how attachment dimensions affect the choice of specific and distinct coping strategies and their future consequences over time.

Implications of These Results

Given the significant effects of maladaptive perfectionism and ineffective coping on future depression, this study suggests that these mediating variables may serve as intervention tools to reduce depressive symptoms. For the maladaptive perfectionism mediator, clinicians first can help college students understand how their quality of attachment impacts their maladaptive perfectionism tendencies and thereby influences future depression. Second, clinicians can help perfectionists to understand negative consequences and positive benefits of having excessively high standards. Third, individuals' development of maladaptive perfectionism tendencies may be related to positive motivations (e.g., "If I am perfect, others will like me"). It is important for clinicians to explore with students the positive motivations behind the students' maladaptive perfectionism tendencies.

In addition, in relation to the ineffective coping mediator, research has indicated that problem-solving training is a successful intervention strategy for presenting problems such as depression (e.g., Nezu, Nezu, & Perri, 1989). College students, for example, may learn alternative ways of coping to enhance their coping effectiveness and, in turn, reduce their depression. Equally important, we can lead college students who have high levels of maladaptive perfectionism to be aware of areas in their lives where they are using effective coping strategies. As a consequence, these students may experience a more realistic perception of their abilities and be more apt to apply adaptive methods in other life domains, thereby reducing depressive symptoms.

Limitations of the Present Research

There are several limitations of this study that we should note. As in most previous studies examining mediators of the relation between attachment and distress, the participants in the present study were predominately young, White, midwestern college students. Researchers need to replicate the present model with populations other than college students (e.g., racial/ethnic minority groups and clinical populations) before making any generalization to such populations. Future researchers should also examine these variables over more than two time points to obtain a better understanding of the nature of their relations over time. Moreover, the current study is limited to self-report measures, which raises the issue of monomethod bias. It is also important to note that attachment avoidance was not significantly associated with either the initial level of depression ($r = .03$) or future depression ($r = .11$) in the measurement model. This nonsignificant result is inconsistent with the findings of previous research that found attachment avoidance to be significantly related to depression or distress (e.g., Lopez et al., 2002; Mallinckrodt & Wei, 2005; Wei et al., 2003, 2004, 2005). One possible explanation for the nonsignificant correlation between attachment avoidance and depression involves the nature of this specific sample.

Conclusion

In conclusion, the results of this study have several important implications for the attachment literature. First, the present results indicate that maladaptive perfectionism served as a mediator between attachment and future depression, even after we controlled for the initial levels of maladaptive perfectionism, ineffective coping, and depression. Second, the results do not indicate that the quality of attachment influenced future depression through the use of ineffective ways of coping. Instead, the quality of attachment appeared to influence future depression through maladaptive perfectionism and, in turn, people's use of the ineffective coping strategies in the future to deal with their depression. Third, the results clarify previously inconsistent findings regarding the order of maladaptive perfectionism and ineffective coping between attachment and distress in the literature. Also, the results indicate that ineffective coping mediated the relation between maladaptive perfectionism and depression, even after we controlled for the initial levels of maladaptive perfectionism, ineffective coping, and depression. Fourth, ineffective coping and maladaptive perfectionism appeared to influence each other at the same time point or over time, with both variables contributing to depression. Finally, the present study used a longitudinal design to examine the causal relations among these variables to better understand the process of how the quality of attachment impacts future depression. Results from this longitudinal design provide stronger empirical evidence than have previous cross-sectional studies regarding the mediating role of maladaptive perfectionism and ineffective coping in the relation between attachment and future depression. The present results suggest that clinicians can help individuals with insecure attachment to decrease their depression by either (a) reducing their maladaptive perfectionism tendencies or (b) enhancing their coping effectiveness. Given the difficulty associated with altering the quality of attachment (Bowlby, 1988), these two types of interventions may allow us to help individuals with high levels of attachment anxiety or attachment avoidance to overcome feelings of depression.

References

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103,* 411–423.

Andersson, P., & Perris, C. (2000). Attachment styles and dysfunctional assumptions in adults. *Clinical Psychology and Psychotherapy, 7,* 47–53.

Baron, M. R., & 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.

Besser, A., & Priel, B. (2003). A multisource approach to self-critical vulnerability to depression: The moderating role of attachment. *Journal of Personality, 71,* 515–555.

Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation.* New York: Basic Books.

Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss, sadness and depression.* New York: Basic Books.

Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development.* New York: Basic Books.

Boyd, J. H., Weissman, M. M., Thompson, W. D., & Meyers, J. K. (1982). Screening for depression in a community sample: Understanding discrepancies between depression symptom and diagnostic scales. *Archives of General Psychiatry, 39,* 1195–1200.

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment: An integrative overview. In J. A. Simpson &

W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford Press.

Carnelley, K. B., Pietromonaco, P. R., & Jaffe, K. (1994). Depression, working models of others, and relationship functioning. *Journal of Personality and Social Psychology, 66,* 127–140.

Cassidy, J. (1994). Emotion regulation: Influences of attachment relationships. *Monographs of the Society for Research in Child Development, 59,* 228–283.

Cassidy, J. (2000). Adult romantic attachments: A development perspective on individual differences. *Review of General Psychology, 4,* 111–131.

Cassidy, J., & Kobak, R. R. (1988). Avoidance and its relation to other defensive processes. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 300–323). Hillsdale, NJ: Erlbaum.

Chang, E. C. (2002). Examining the link between perfectionism and psychological maladjustment: Social problem solving as a buffer. *Cognitive Therapy and Research, 26,* 581–595.

Chang, E. C., & Rand, K. L. (2000). Perfectionism as a predictor of subsequent adjustment: Evidence for a specific diathesis-stress mechanism among college students. *Journal of Counseling Psychology, 47,* 129–137.

Chang, E. C., & Sanna, L. J. (2001). Negative attributional style as a moderator of the link between perfectionism and depressive symptoms: Preliminary evidence for an integrative model. *Journal of Counseling Psychology, 48,* 490–495.

Cheng, S. K. (2001). Life stress, problem solving, perfectionism, and depressive symptoms in Chinese. *Cognitive Therapy and Research, 25,* 303–310.

Cohen, J. (1988). *Statistical power analysis for the social sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cox, B. J., & Enns, M. W. (2003). Relative stability of dimensions of perfectionism in depression. *Canadian Journal of Behavioral Science, 35,* 124–132.

Dunkley, D. M., Blankstein, K. R., Halsall, J., Williams, M., & Winkworth, G. (2000). The relation between perfectionism and distress: Hassles, coping, and perceived social support as mediators and moderators. *Journal of Counseling Psychology, 47,* 437–453.

Dunkley, D. M., Zuroff, D. C., & Blankstein, K. R. (2003). Self-critical perfectionism and daily affect: Dispositional and situational influences on stress and coping. *Journal of Personality and Social Psychology, 84,* 234–252.

Efron, B., & Tibshirani, R. (1993). *An introduction to the bootstrap.* New York: Chapman & Hall/CRC.

Enns, M. W., & Cox, B. (2002). The nature and assessment of perfectionism: A critical analysis. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 33–62). Washington, DC: American Psychological Association.

Etringer, B. D., Altmaier, E. M., & Bowers, W. (1989). An investigation into the cognitive functioning of bulimic women. *Journal of Counseling and Development, 68,* 216–219.

Flett, G. L., & Hewitt, P. L. (2002). Perfectionism and maladjustment: An overview of theoretical, definitional, and treatment issues. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 5–32). Washington, DC: American Psychological Association.

Flett, G. L., Hewitt, P. L., Blankstein, K. R., & Mosher, S. W. (1995). Perfectionism, life events, and depressive symptoms: A test of a diathesis-stress model. *Current Psychology, 14,* 112–137.

Heppner, P. P., Cook, S. W., Wright, D. M., & Johnson, C. (1995). Progress in resolving problems: A problem-focused style of coping. *Journal of Counseling Psychology, 42,* 279–293.

Heppner, P. P., Witty, T. E., & Dixon, W. A. (2004). Problem-solving appraisal and human adjustment: A review of 20 years of research using the Problem Solving Inventory. *Counseling Psychologist, 32,* 344–428.

Hewitt, P. L., & Flett, G. L. (1991). Dimensions of perfectionism in unipolar depression. *Journal of Abnormal Psychology, 100,* 98–101.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1–55.

Joiner, T. E., Heatherton, T. F., Rudd, M. D., & Schmidt, N. B. (1997). Perfectionism, perceived weight status, and bulimic symptoms: Two studies testing a diathesis-stress model. *Journal of Abnormal Psychology, 106,* 145–153.

Joreskog, K. G., & Sorbom, D. (2003). LISREL (Version 8.54) [Computer software]. Lincolnwood, IL: Scientific Software International, Inc.

Lopez, F. G. (1995). Contemporary attachment theory: An introduction with implications for counseling psychology. *The Counseling Psychologist, 23,* 395–415.

Lopez, F. G., & Brennan, K. A. (2000). Dynamic processes underlying adult attachment organization: Toward an attachment theoretical perspective on the healthy and effective self. *Journal of Counseling Psychology, 47,* 283–301.

Lopez, F. G., & Gormley, B. (2002). Stability and change in adult attachment style over the first-year college transition: Relations to self-confidence, coping, and distress patterns. *Journal of Counseling Psychology, 49,* 355–364.

Lopez, F. G., Mauricio, A. M., Gormley, B., Simko, T., & Berger, E. (2001). Adult attachment orientations and college student distress: The mediating role of problem coping styles. *Journal of Counseling & Development, 79,* 459–464.

Lopez, F. G., Mitchell, P., & Gormley, B. (2002). Adult attachment and college student distress: Test of a mediational model. *Journal of Counseling Psychology, 49,* 460–467.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7,* 83–104.

Mallinckrodt, B. (2000). Attachment, social competencies, and interpersonal process in psychotherapy. *Psychotherapy Research, 10,* 239–266.

Mallinckrodt, B., & Wei, M. (2005). Attachment, social competencies, interpersonal problems, and psychological distress. *Journal of Counseling Psychology, 52,* 358–367.

Mikulincer, M., Shaver, P. R., & Pereg, D. (2003). Attachment theory and affect regulation: The dynamic development, and cognitive consequences of attachment-related strategies. *Motivation and Emotion, 27,* 77–102.

Nezu, A. M., Nezu, C. M., & Perri, M. G. (1989). *Problem-solving therapy for depression: Theory, research, and clinical guidelines.* New York: Wiley.

Pietromonaco, P. R., & Feldman Barrett, L. (2000). The internal working models concept: What do we really know about the self in relation to others? *Review of General Psychology, 4,* 155–157.

Radloff, L. S. (1977). The Center for Epidemiologic Studies Depression Scale (CES-D) for research in the general population. *Applied Psychological Measurements, 1,* 385–401.

Rice, K. G., & Lapsley, D. K. (2001). Perfectionism, coping, and emotional adjustment. *Journal of College Student Development, 42,* 157–167.

Rice, K. G., & Mirzadeh, S. A. (2000). Perfectionism, attachment, and adjustment. *Journal of Counseling Psychology, 47,* 238–250.

Roberts, J. E., Gotlib, I. H., & Kassel, J. D. (1996). Adult attachment security and symptoms of depression: The mediating roles of dysfunctional attitudes and low self-esteem. *Journal of Personality and Social Psychology, 70,* 310–320.

Russell, D. W., Kahn, J. H., Spoth, R., & Altmaier, E. M. (1998). Analyzing data from experimental studies: A latent variable structural equation modeling approach. *Journal of Counseling Psychology, 45,* 18–29.

Santor, D. A., Zuroff, D. C., Ramsay, J. O., Cervantes, P., & Palacios, J. (1995). Examining scale discriminability in the BDI and CES-D as a function of depressive severity. *Psychological Assessment, 7,* 131–139.

Satorra, A., & Bentler, P. M. (1988). Scaling corrections for chi-square statistics in covariance structure analysis. In *American Statistical Association 1988 proceedings of the business and economic section* (pp. 308–313). Alexandria, VA: American Statistical Association.

Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika, 66,* 507–514.

Shaver, P. R., & Mikulincer, M. (2002). Attachment-related psychodynamics. *Attachment and Human Development, 4,* 133–161.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and non-experimental studies: New procedures and recommendations. *Psychological Methods, 7,* 422–445.

Slaney, R. B., Rice, K. G., Mobley, M., Trippi, J., & Ashby, J. S. (2001). The revised Almost Perfect Scale. *Measurement and Evaluation in Counseling and Development, 34,* 130–145.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology 1982* (pp. 290–312). Washington, DC: American Sociological Association.

Sobel, M. E. (1988). Direct and indirect effects in linear structural equation models. In J. S. Long (Ed.), *Common problems/proper solutions* (pp. 46–64). Beverly Hills, CA: Sage.

Soukup, V. M., Beiler, M. E., & Terrell, F. (1990). Stress, coping style, and problem solving ability among eating-disordered inpatients. *Journal of Clinical Psychology, 46,* 592–599.

Vohs, K. D., Bardone, A. M., Joiner, T. E., & Abramson, L. Y. (1999). Perfectionism, perceived weight status, and self-esteem interact to predict bulimic symptoms: A model of bulimic symptoms development. *Journal of Abnormal Psychology, 108,* 695–700.

Ward, A., Ramsay, R., & Treasure, J. (2000). Attachment research in eating disorders. *British Journal of Medical Psychology, 73,* 35–51.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54,* 1063–1070.

Wei, M., Heppner, P. P., & Mallinckrodt, B. (2003). Perceived coping as a mediator between attachment and psychological distress: A structural equation modeling approach. *Journal of Counseling Psychology, 50,* 438–447.

Wei, M., Mallinckrodt, B., Russell, D. W., & Abraham, T. W. (2004). Maladaptive perfectionism as a mediator and moderator between attachment and negative mood. *Journal of Counseling Psychology, 51,* 201–212.

Wei, M., Vogel, D. L., Ku, T.-Y., & Zakalik, R. A. (2005). Adult attachment, affect regulation, negative mood, and interpersonal problems: The mediating roles of emotional reactivity and emotional cutoff. *Journal of Counseling Psychology, 52,* 14–24.

Weissman, M. M., Sholomskas, D., Pottenger, M., Prusoff, B. A., & Locke, B. Z. (1977). Assessing depressive symptoms in five psychiatric populations: A validation study. *American Journal of Epidemiology, 106,* 203–214.