Adult Attachment, Dependence, Self-Criticism, and Depressive Symptoms: A Test of a Mediational Model

Amy Cantazaro and Meifen Wei
Iowa State University

ABSTRACT    Attachment anxiety is expected to be positively associated with dependence and self-criticism. However, attachment avoidance is expected to be negatively associated with dependence but positively associated with self-criticism. Both dependence and self-criticism are expected to be related to depressive symptoms. Data were analyzed from 424 undergraduate participants at a large Midwestern university, using structural equation modeling. Results indicated that the relation between attachment anxiety and depressive symptoms was fully mediated by dependence and self-criticism, whereas the relation between attachment avoidance and depressive symptoms was partially mediated by dependence and self-criticism. Moreover, through a multiple-group comparison analysis, the results indicated that men with high levels of attachment avoidance are more likely than women to be self-critical.

In attachment theory, Bowlby (e.g., 1969, 1973, 1980) theorized that individuals with different attachment orientations have different internal working models of the self and of others. Those with higher levels of attachment anxiety are likely to have a negative internal working model of the self due to receiving inconsistent care and attention from caregivers (Mikulincer, Shaver, & Pereg, 2003; Pietromonaco & Feldman Barrett, 2000). As a result, they become more likely to fear abandonment, overexaggerate their needs, and experience distress when others are unavailable (Brennan, Clark, & Shaver, 2003).

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Correspondence concerning this article should be addressed to Amy Cantazaro or Meifen Wei, Department of Psychology, W112 Lagomarcino Hall, Iowa State University, Ames, IA 50011-3180. Email: cantazar@iastate.edu or wei@iastate.edu.

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1998). Conversely, those with higher levels of attachment avoidance are likely to have a negative internal working model of others because their caregivers tended to be unresponsive to their needs. Thus, they tend to develop a fear of interpersonal closeness, demonstrate compulsive self-reliance in order to avoid rejection from others, and are reluctant to self-disclose (e.g., Brennan et al., 1998; Mikulincer et al., 2003).

Recently, Shorey and Snyder (2006) conducted a review of the role of adult attachment in psychopathology and psychotherapy outcomes. They concluded that “attachment . . . can contribute greatly to our understanding of the etiology and maintenance of pathological states and thus lead to more effective psychotherapy interventions” (p. 12). In a nationally representative adult sample, Mickelson, Kessler, and Shaver (1997) found that psychopathology was positively associated with both attachment anxiety and attachment avoidance. Specifically, depression was generally found to be positively associated with both attachment anxiety and avoidance (e.g., Armsden, McCauley, Greenberg, Burke, & Mitchell, 1990; Kobak & Sceery, 1988; Kobak, Sudler, & Gamble, 1991; Roberts, Gotlib, & Kassel, 1996). While some studies indicated a stronger, positive association between attachment anxiety and depression than between attachment avoidance and depression (e.g., Cooper, Shaver, & Collins, 1998; Wei, Mallinckrodt, Larson, & Zakalik, 2005; Wei, Mallinckrodt, Russell, & Abraham, 2004), others have found that the strength of this relationship does not differ across the two attachment dimensions (Mickelson et al., 1997). In this study, we continue to explore the association between adult attachment (i.e., attachment anxiety and attachment avoidance) and depressive symptoms.

Similar to personality traits, adult attachment patterns are difficult to alter and tend to be stable over time. Roberts et al. (1996) initiated the first attempt to explore mediators between attachment and depression to help circumvent this stability. Ideally, the identified mediator in this type of research is something that can be changed or modified (MacKinnon, Krull, & Lockwood, 2000). It is hoped that treatment approaches can be designed to target these mediating factors, indirectly reducing depressive symptoms. Since this initial mediation study, more have followed with the same goal. For example, in a series of independent studies, Wei and colleagues have successfully demonstrated that maladaptive perfectionism (Wei, Heppner, Russell, & Young, 2006), coping style (Wei, Mallinkrodt, et al., 2004), and basic psychological needs satisfaction
(Wei, Shaffer, Young, & Zakalik, 2005) are mediating factors between adult attachment and depressive symptoms.

This line of research has expanded further by examining the differential pathways to depression for each attachment dimension. Wei, Mallinckrodt, et al. (2005) reported that the capacity for self-reinforcement and the need for reassurance from others were both mediators for the association between attachment anxiety and depressive symptoms. Conversely, only the capacity for self-reinforcement was a significant mediator for the link between attachment avoidance and depressive symptoms.

However, two important risk factors for depression, interpersonal dependence and self-criticism, are missing in the literature as links between attachment and depression. While these variables (i.e., dependence and self-criticism) are often discussed as personality variables, research has demonstrated they may be malleable through psychotherapy (Rector, Bagby, Segal, Joffe, & Levitt, 2000). Dependence is seen as a preoccupation with interpersonal relationships and excessive worry related to being uncared for and unloved, often at the expense of developing an individuated or autonomous sense of self (Blatt & Homann, 1992). Self-criticism, on the other hand, involves “constant and harsh self-scrutiny and evaluation and a chronic fear of being disapproved of or criticized, and of losing the approval and acceptance of significant others” (Blatt & Homann, 1992, p. 528). Zuroff and Fitzpatrick (1995) indicated that “self-critics are ambivalent about interpersonal relationships because while they desire approval, respect, and admiration, they fear disapproval and loss of control and autonomy” (p. 254). When an achievement goal is not reached, they may become highly self-critical and experience feelings of failure, worthlessness, or guilt (Blatt, 2004).

Recently, Mongrain and Leather (2006) indicated that those with high levels of dependence or self-criticism are particularly vulnerable to depression even after controlling for neuroticism, previous depression, and other mental health disorders. Marshall, Zuroff, McBride, and Bagby (2008) additionally found that higher self-criticism predicted poorer treatment outcomes and that higher dependence showed a trend toward the same effect. Conversely, Rector et al. (2000) reported that the degree to which self-criticism was reduced in treatment was the best predictor of treatment outcomes on reducing depressive symptoms. It seems that dependence and self-criticism are robustly associated with depressive symptom severity.
Furthermore, Gilbert and Procter (2006) indicated that it is critical to understand the underlying sources or fears (e.g., others’ rejection or anger) of self-critical strategy in order to effectively reduce levels of self-criticism. With this knowledge, people were able to demonstrate compassion toward those fears and ultimately experienced a reduction in self-critical tendencies. This article highlights the importance of Bowlby’s (1969, 1973, 1980) attachment theory as a theoretical framework in understanding the sources of dependent and self-critical strategies. As we described above, because of others’ inconsistent care, those with higher levels of attachment anxiety are likely to feel ambivalent about others’ availability and love, fear rejection, and have a negative view of the self. It is likely they developed the survival tools of (a) being excessively preoccupied with interpersonal relationships to prevent others from showing unavailability or (b) being harshly self-critical to help correct their misbehaviors in order to keep a good standing with others and ultimately earn their love. In support of this reasoning, empirical findings by both Murphy and Bates (1997) and Zuroff and Fitzpatrick (1995) have indicated attachment anxiety is positively associated with dependence and self-criticism.

Conversely, because of experiencing unresponsiveness from others, those with higher levels of attachment avoidance are likely to fear interpersonal closeness, be compulsively self-reliant, and have a negative view of others (e.g., Pietromonaco & Feldman Barrett, 2000). In order to protect themselves against anticipated rejection, they are likely to develop a survival tool of not relying on others. Thus, it is reasonable to expect a negative association between attachment avoidance and dependence. Empirical studies support this theoretical perspective, finding a negative relationship between attachment avoidance and dependence (Murphy & Bates, 1997; Zuroff & Fitzpatrick, 1995). Moreover, those high in attachment avoidance may internalize others’ rejection or develop self-criticism as a coping mechanism to deal with rejection (e.g., being hard on oneself to help one become more ideal and worthy of love). Previous studies indicated a positive association between attachment avoidance and self-criticism (Murphy & Bates, 1997; Zuroff & Fitzpatrick, 1995). It was expected that attachment avoidance would be negatively associated with dependence, but positively associated with self-criticism.

In sum, one’s attachment pattern is relatively stable and difficult to alter (Rothbard & Shaver, 1994), much like traits more typically associated with personality (e.g., extraversion). Even though depen-
dence and self-criticism are not easy to modify, practitioners and researchers have begun to address strategies for coping with these patterns. For example, Gilbert and Procter (2006) proposed the tool of developing compassion and empathy toward one’s underlying fears; this strategy seems to be effective at reducing self-criticism. Bergner (2008) similarly proposed a series of adaptive strategies to overcome self-criticism (e.g., learning alternative ways). As the above literature helps to illustrate, by understanding one’s attachment style people can become more knowledgeable about possible sources of their dependence and self-criticism. With this understanding, people can learn to adopt different strategies to manage their dependence and self-criticism in the hope of reducing depressive symptoms. Unfortunately, we could not locate any published studies beyond the direct associations discussed above that would indicate the extent to which dependence and self-criticism serve as mediators between attachment (i.e., anxiety or avoidance) and depressive symptoms. Thus, in the present study, we examine the mediation effects of dependence and self-criticism on the known association between attachment and depressive symptoms.

There are four hypotheses in the present study: (a) attachment anxiety will be positively correlated with dependence and to self-criticism; (b) dependence and self-criticism will be significant mediators of the link between attachment anxiety and depressive symptoms; (c) attachment avoidance will be positively correlated with self-criticism, but negatively correlated with dependence; (d) self-criticism and dependence will be significant mediators of the link between attachment avoidance and depressive symptoms. Figure 1 provides a graphic summary of such predictions.

Finally, men and women may differ in their experience of self-critical or dependent tendencies, even with similar attachment histories. Beck (1983) originally theorized that women are more likely to show a dependent tendency, whereas men are more likely to show a self-critical tendency. There appears to be a need to investigate this possibility as little research has since been done examining the relations between the variables of these personal styles, gender, and depressive symptoms (McBride, Bacchiochi, & Bagby, 2005). Additionally, virtually no research exists that includes attachment, the theorized precursor. For exploratory purposes, we examined whether there were sex differences regarding associations between these variables.
Participants

A total of 424 college students (263 women and 159 men) who were enrolled in psychology courses at Iowa State University participated in this study. Ages ranged from 18 to 32 ($M = 19.45$, $SD = 1.88$). The percentage of ethnic minority participants was comparable to the ethnic makeup of the university from which the sample was drawn. The percentages in the present study were as follows: Caucasian 73%, African American 3%, Asian American 3%, Latino/a American 2%, Native American 1%, Multiracial 2%, and international students 2%; 14% of participants chose “other” for their racial identity. All participants were either currently in a romantic relationship or had been in a romantic relationship at some point during their lives. At the time of the study, 49.5% of participants were in a committed dating relationship while an additional 1.7% were married; 45.8% of participants were single. The remaining participants were divorced (0.2%), widowed (0.2%), or other (2.6%). A large percentage of participants were freshmen (52.3%) or sophomores (22.9%). The remaining students were juniors (18.1%), seniors (6.5%), or other (0.2%).

Instruments

Attachment

Attachment was assessed using the Experiences in Close Relationships Scale (ECR; Brennan et al., 1998). The ECR was developed by factor
analyzing the extant 14 attachment measures at the time (60 subscales and 323 items) with over 1,000 participants. This approach resulted in the identification of two relatively orthogonal continuous attachment dimensions, Anxiety and Avoidance (Brennan et al., 1998). The Anxiety subscale (18 items) measures fears of abandonment and rejection, and the Avoidance subscale (18 items) measures fears of intimacy and discomfort with closeness or dependence. Each item is rated on a 7-point Likert scale ranging from 1 (disagree strongly) to 7 (agree strongly). The range of possible scores for both the Anxiety and Avoidance subscales is 18 to 126, with higher scores indicating higher attachment anxiety or attachment avoidance. The ECR has been utilized in a large number of studies with college student samples (e.g., Janzen, Fitzpatrick, & Drapeau, 2008; Romano, Fitzpatrick, & Janzen, 2008). From these studies, adequate coefficient alphas have been consistently reported, implying this scale was appropriate for use in our sample. For example, Janzen et al. (2008) reported alphas of .90 (Anxiety) and .91 (Avoidance) while Romano et al. (2008) reported similar alphas of .90 (Anxiety) and .94 (Avoidance). Coefficient alphas of .91 and .94 for Anxiety and Avoidance were found in the current study, respectively. Construct validity was supported by the positive correlations of attachment anxiety and avoidance with self-concealment and self-splitting (Lopez, Mitchell, & Gormley, 2002).

Dependence and Self-Criticism

Two measures were used to assess dependence and self-criticism. The first measure for assessing dependence and self-criticism is the Depressive Experiences Questionnaire (DEQ; Blatt, D’Affitti, & Quinlan, 1976). The DEQ is a 66-item measure using a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). The DEQ has undergone a number of revisions to the scoring procedure since its development in 1976 (Bagby, Parker, Joffe, & Buis, 1994; Santor, Zuroff, & Fielding, 1997; Viglione, Lovette, Gottlieb, & Friedberg, 1995; Welkowitz, Lish, & Bond, 1985); thus a number of different scoring procedures were available. For this study, the McGill Revision (Santor et al., 1997) was utilized as it reduced the complexity of the original scoring system. Using a manual provided by Zuroff (personal communication, December 5, 2005) for the McGill scoring procedure, Dependence and Self-Criticism scores were derived using the SPSS statistical software program. Higher scores indicate a higher level of Dependence and Self-Criticism. Adequate reliability has been reported for the McGill scales, with coefficient alphas ranging from .65 to .72 and .78 to .76 for Dependence and Self-Criticism, respectively (Santor et al., 1997). More generally, this measure has been widely used across studies (see Blatt, 2004, for a discussion). Research has con-
sitionally indicated the presence of three stable factors with high internal consistency and test-retest reliability (Zuroff, Quinlan, & Blatt, 1990); for our purposes we utilized two of the three subscales. For the current study, coefficient alphas were .79 and .81 for Dependence and Self-Criticism, respectively. Criterion validity of the McGill DEQ has been demonstrated by Santor et al. (1997) through positive correlations between the McGill Dependency Scale and the Clarke Institute of Psychiatry Dependency Scale in college student men and women \( (r = .78 \) and \( r = .84 \) ) as well as the New York University Dependency Scale \( (r = .87 \) and \( r = .88 \); men and women, respectively). These authors also found positive correlations between the McGill Self-Criticism Scale and the Clarke Institute of Psychiatry Self-Criticism Scale in college student men and women \( (r = .80 \) and \( r = .82 \) ) as well as the New York University Self-Criticism Scale \( (r = .90 \) and \( r = .91 \); men and women, respectively).

We administered a second measure of dependence and self-criticism, the Personal Style Inventory-II (PSI-II; Robins, Ladd, Welkowitz, & Blaney, 1994). The PSI-II is a 48-item instrument used to measure sociotropy (dependence) and autonomy (self-criticism) in relation to depression. Sociotropy is defined by the authors as social dependence and consists of three subscales: Concern About What Others Think, Dependence, and Pleasing Others. Autonomy is defined as the person’s investment in increasing his or her own independence and consists of three subscales: Self-criticism, Need for Control, and Defensive Separation. For the present study, only the Dependence (7 items) and Self-criticism (4 items) subscales were used as these were the constructs of interest. Each scale is scored on a 6-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree). Scores range from 7 to 42 for Dependence and from 4 to 24 for Self-criticism, with higher scores indicating a higher level of that construct. The internal consistencies for the Dependence and Self-criticism scales have not been reported independent of their respective larger subscales, to our knowledge, in the published literature. However, the subscales from which these are derived (i.e., Sociotropy, Autonomy) demonstrate excellent internal consistency with alphas reported at .90 and .87, respectively (Robins et al., 1994). Both Dependence and Self-criticism showed adequate reliability in our study \((\alpha = .70)\). In addition, the full measure correlated in the expected direction with depression (Ouimette & Klein, 1993), demonstrating construct validity.

Depressive Symptoms

Three depression scales were used to measure depressive symptoms. The Self-Rating Depression Scale (SDS; Zung, 1965) is a 20-item self-report measure that uses a 4-point Likert-type scale ranging from 1 (some or a
little of the time) to 4 (most or all of the time). The SDS was developed to examine three aspects of depressive symptoms: pervasive affect, physiological concomitants, and psychological concomitants. The range of possible raw scores is from 20 to 80, with higher scores indicating greater depressive symptoms. Zung reported a cut-off score of 50 or greater for clinical depression. The mean score of 36.33 in this study is lower than the clinical cut-off score. Our mean score is similar to the mean score in Wei, Shaffer, and colleagues’ (2005) study with college students ($M = 36.24$, $SD = 8.28$) with a Cohen’s $d$ of 0.01 (i.e., a small effect size based on Cohen, 1992). On the other hand, the mean score for those with chronic pain ($M = 59.08$, $SD = 13.81$; Lee, Chan, & Berven, 2007) or for elderly depressed patients ($M = 55.4$, $SD = 7.6$; Cochran & Hammen, 1985) is higher than the current study’s mean (Cohen’s $d$ of 0.7 and 0.8, respectively, indicates a large effect size). Wei, Shaffer, et al. reported a coefficient alpha of .85 with a college student sample; a similar alpha level was found in this study ($z = .84$). Zung reported convergent validity through correlations with other established measures of depression.

The Center for Epidemiological Studies-Depression Scale, Short Form (CES-D short version; Kohout, Berkman, Evans, & Cornoni-Huntley, 1993) was used as a second measure of depressive symptoms. The CES-D short form has 11 items to assess the frequency of depressive symptoms. When answering the items, participants use a 4-point Likert-type scale ranging from 0 (rarely or none of the time [less than 1 day]) to 3 (most or all of the time [5–7 days]). The scores range from 0 to 33, with higher total scores indicating more frequent depressive symptoms. Suthers, Gatz, and Fiske (2004) reported a cut-off score of 9 or greater for clinical depression. The mean score of 7.24 in this study is lower than the clinical cut-off point. Also, this mean score ($SD = 5.30$) is similar to the mean score in Wei, Russell, and Zakalik’s (2005) study ($M = 7.44$, $SD = 5.65$), with a Cohen’s $d$ of 0.04 (i.e., a small effect size). Wei, Russell, et al. (2005) demonstrated the construct validity through a correlation with loneliness. They also reported a coefficient alpha of .76; the coefficient alpha was .81 for the current study.

The Depression, Anxiety, and Stress Scale-Depression subscale, Short Form (DASS-D; Lovibond & Lovibond, 1995) is a 7-item measure used to assess depressive symptoms. Respondents are asked to rate each symptom in regard to their symptom severity over the previous week from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Total scores range from 0 to 21, with higher scores indicating higher levels of depressive symptoms. The mean score ($M = 3.09$, $SD = 3.32$) in our study is similar to that from normative data in a large general adult sample ($M = 2.83$, $SD = 3.87$; Henry & Crawford, 2005), with a Cohen’s $d$ of 0.07 (i.e., a small effect size). However, the mean score
for elderly clinical patients ($M = 8.92, SD = 8.34$; Gloster et al., 2008) is higher than the current study’s mean score (i.e., a Cohen’s $d$ of 0.9, a large effect size). The coefficient alpha was .88 in Henry and Crawford’s study and .86 in the current study. The DASS-D short form evidences convergent and discriminate validity when compared with other valid measures of depression (Antony, Bieling, Cox, Enns, & Swinson, 1998; Henry & Crawford, 2005).

### Latent Variables

We created a latent variable with multiple measured variables (i.e., indicators) for each construct in the present study in order to remove measurement error. The two Dependence and the two Self-Criticism subscales from the DEQ and PSI-II were used as the measured variables for the dependence and self-criticism latent variables. Three measured variables (i.e., CES-D short form, SDS, and DASS-D short form) were used for the latent variable of depressive symptoms.

However, the creation of latent attachment variables was slightly different. The ECR scale (measured attachment variable) is a comprehensive scale as it emerged and combined items from 14 different attachment inventories (Brennan et al., 1998). Thus, including additional measures of attachment would likely have created redundancy in measurement. Therefore, we used item parcels to create the latent variables of attachment anxiety and attachment avoidance. Bandalos and Finney (2001) indicated that “parcelling involves summing or averaging together two or more items and using the resulting sum or average as the basic unit of analysis in structural equation modeling” (p. 269). Also, the use of parcelling will typically result in a better model fit than the use of each item because of the reduction in the number of parameters (for a discussion, see Russell, Kahn, Spoth, & Altmaier, 1998). Following Russell and colleagues’ recommendations, exploratory factor analysis was first conducted for the Anxiety subscale by using the maximum-likelihood method with a single factor extraction. The magnitude of the factor loadings was rank-ordered from highest to lowest. To equalize the loadings for each parcel on its respective factor, we successively assigned the highest- and lowest-ranking items as pairs into each parcel. Therefore, a total of three parcels (i.e., six items for each parcel) were created for the attachment anxiety latent variable. The same procedure was repeated to create the attachment avoidance latent variable. Russell et al. indicated that “when this procedure is used, the
resulting item parcels should reflect the underlying construct . . . to an equal degree” (p. 22). Because of this advantage, we chose Russell and colleagues’ (1998) method over other methods of parceling (e.g., random assignment of each item for parceling).

Procedure
All participants were college students who received research credit in psychology courses. They were informed that the purpose of this study was to gain a better understanding of the associations among relationship patterns, personal styles, and mood. In order to control for order effect, two forms were designed for data collection. It took about 30–50 minutes to complete the survey package. Data were collected by trained undergraduate research assistants in groups of no more than 45 participants at one time. No identifying information was requested on survey materials. After participants completed the survey, they were given a debriefing form and thanked for their participation.

RESULTS
Descriptive Statistics
Means, standard deviations, and zero-order correlations for the two attachment dimensions (i.e., anxiety and avoidance) and the 13 measured variables (i.e., three attachment anxiety parcels, three attachment avoidance parcels, two dependence variables, two self-criticism variables, and three depressive symptoms variables) are shown in Table 1. Most measured variables demonstrated a significant correlation with the other measured variables, with a couple of exceptions. The correlation between the Dependence and Self-Criticism subscales of the DEQ was not significant ($r = -.09$). The PSI-II Self-Criticism subscale was not significantly correlated with attachment avoidance ($r = .08$).

Preliminary Analyses
A series of $t$ tests were computed to determine whether there were order effects among the nine main measured variables (i.e., attachment anxiety, attachment avoidance, two dependence variables, two self-criticism variables, and three depressive symptoms variables). No significant order effects were found, $t$s (422) = −.31 to 1.75,
<table>
<thead>
<tr>
<th>Table 1</th>
<th>Means, Standard Deviations, and Correlations Among Two Attachment Dimensions and 13 Observed Variables</th>
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<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>A. Anxiety</td>
<td>65.39</td>
</tr>
<tr>
<td>B. Avoidance</td>
<td>49.85</td>
</tr>
<tr>
<td>1. Anxiety 1</td>
<td>21.72</td>
</tr>
<tr>
<td>2. Anxiety 2</td>
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<tr>
<td>3. Anxiety 3</td>
<td>22.57</td>
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<td>17.56</td>
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<tr>
<td>5. Avoid 2</td>
<td>15.96</td>
</tr>
<tr>
<td>6. Avoid 3</td>
<td>16.33</td>
</tr>
<tr>
<td>7. DEQ-D</td>
<td>133.07</td>
</tr>
<tr>
<td>8. PSI-D</td>
<td>28.07</td>
</tr>
<tr>
<td>9. DEQ-SC</td>
<td>114.25</td>
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<tr>
<td>10. PSI-SC</td>
<td>15.05</td>
</tr>
<tr>
<td>11. SDS</td>
<td>36.33</td>
</tr>
<tr>
<td>12. CES-D</td>
<td>7.24</td>
</tr>
<tr>
<td>13. DASS-D</td>
<td>3.09</td>
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</table>

*Note. N = 424. Anxiety 1, 2, 3 = three parcels from the Anxiety subscale of Experiences in Close Relationships Scale; Avoid 1, 2, 3 = three parcels from the Avoidance subscale of the Experiences in Close Relationships Scale; DEQ-D = Dependence subscale from the Depressive Experiences Questionnaire; PSI-D = Dependence subscale from the Personal Styles Inventory II; DEQ-SC = Self-Criticism subscale from the Depressive Experiences Questionnaire; PSI-SC = Perfectionism/Self-Criticism subscale from the Personal Styles Inventory II; SDS = Self-Rating Depression Scale; CES-D = Center for Epidemiologic Studies Depressed Mood Scale, short form; DASS-D = Depression subscale from the Depression, Anxiety, and Stress Scale, short form.*

*p < .05. **p < .01.
Therefore, the data from both questionnaire forms were combined for the following analyses.

One MANOVA was used to examine whether there were significant differences between the nine main variables among different ethnic groups. The results indicated significant differences among different ethnic groups \((F[7, 416] = 1.39, p = .02)\). Follow-up ANOVAs were conducted to examine which variables’ means were different among different ethnic groups; no univariate analyses yielded significant effects (all \(ps > .05\)).

**Testing Mediation Effects**

**Normality**

The maximum-likelihood method in LISREL 8.54 was used for testing mediation hypotheses. Because this method assumes normality, we first examined the multivariate normality of our observed variables. The results indicated that the data were not normal, \(\chi^2(2, N = 424) = 313.35, p < .01\). Therefore, the Satorra and Bentler (1988) scaled chi-square was reported to adjust for the non-normality of the data and the corrected scaled chi-square difference test (Satorra & Bentler, 2001) was used to compare the nested models.

**Measurement Model**

Anderson and Gerbing (1988) suggested a two-step process for the analysis of structural equation models: (a) conducting a confirmatory factor analysis to determine whether a measurement model has an acceptable fit to the data and then (b) conducting an analysis for the structural model to test the mediation hypothesis. Based on Hu and Bentler’s (1999) suggestion, three fit indices were used to assess the goodness-of-fit for the model: the comparative fit index (CFI; .95 or greater), the root-mean-square error approximation (RMSEA; .06 or less), and the standardized root-mean-square residual (SRMR; .08 or less).

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1. Due to the small sample size of the individual minority groups, additional analyses were conducted that combined all minority groups into one larger group. This combined minority group was then compared with the Caucasian group for all main measures by using ANOVAs. The results indicated no differences between the combined minority group and the Caucasian group among these main variables \((ps > .10)\).
The initial test of the measurement model resulted in a good fit to the data, standard $\chi^2 (56, N = 424) = 221.06, p < .01$, scaled $\chi^2 (56, N = 424) = 178.73, p < .01$, $\text{CFI} = .97$, $\text{RMSEA} = .07$ (90% confidence interval [CI]: .06; .08), $\text{SRMR} = .07$. All of the factor loadings were statistically significant ($p < .01$, see Table 2). This implies that all variables were operationalized adequately through their respective indicators. The expected correlations among the independent latent variables (i.e., attachment anxiety and attachment avoidance), the mediating latent variables (i.e., dependence and self-criticism), and the dependent latent variable (i.e., depressive symptoms) were statistically significant, except for the correlation between dependence and self-criticism ($r = .01, p < .01$; see Table 3). Therefore, the latent variables in the measurement model were used to test the structural model.

**Structural Model**

The hypothetical model (see Figure 1 or Model A in Table 4) is a saturated model (i.e., examining all the possible paths); hence, as expected, the fit indices are identical to those reported in the above measurement model. In order to examine whether mediation occurred, three alternative models were compared.

The first alternative (Model B in Table 4) constrained the direct paths from attachment anxiety to depressive symptoms and from attachment avoidance to depressive symptoms to zero (i.e., the fully mediated model for attachment anxiety and avoidance). When Model A and Model B were compared, the significant result, $\Delta \chi^2 (2, N = 424) = 6.81, p < .05$, indicated that Model A with these two direct paths was a better model than Model B without these direct paths. However, it was not clear from this analysis whether one or both of the direct paths were adding significantly to the model; therefore, comparisons with the remaining alternative models were conducted.

The second alternative (Model C in Table 4) constrains the direct path from attachment avoidance to depressive symptoms to zero (i.e., partially mediated model for attachment anxiety but fully mediated model for attachment avoidance). The significant result, $\Delta \chi^2 (1, N = 424) = 4.57, p < .05$, implies that the direct path from attachment avoidance to depressive symptoms contributes significantly to the model. The significant direct path implies that Model A
Attachment and Depressive Symptoms

Table 2
Factor Loadings for the Measurement Model

<table>
<thead>
<tr>
<th>Measure and Variable</th>
<th>Unstandardized Factor Loading</th>
<th>SE</th>
<th>Z</th>
<th>Standardized Factor Loading</th>
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<tbody>
<tr>
<td>Attachment anxiety</td>
<td></td>
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</tr>
<tr>
<td>Anxiety parcel 1</td>
<td>5.76</td>
<td>.24</td>
<td>23.88</td>
<td>.90**</td>
</tr>
<tr>
<td>Anxiety parcel 2</td>
<td>5.79</td>
<td>.24</td>
<td>24.52</td>
<td>.90**</td>
</tr>
<tr>
<td>Anxiety parcel 3</td>
<td>6.00</td>
<td>.23</td>
<td>26.66</td>
<td>.89**</td>
</tr>
<tr>
<td>Attachment avoidance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance parcel 1</td>
<td>4.18</td>
<td>.15</td>
<td>27.07</td>
<td>.88**</td>
</tr>
<tr>
<td>Avoidance parcel 2</td>
<td>6.05</td>
<td>.22</td>
<td>28.02</td>
<td>.95**</td>
</tr>
<tr>
<td>Avoidance parcel 3</td>
<td>5.82</td>
<td>.22</td>
<td>26.52</td>
<td>.91**</td>
</tr>
<tr>
<td>Dependence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEQ-D</td>
<td>13.93</td>
<td>.80</td>
<td>17.43</td>
<td>.81**</td>
</tr>
<tr>
<td>PSI-D</td>
<td>4.43</td>
<td>.26</td>
<td>17.35</td>
<td>.80**</td>
</tr>
<tr>
<td>Self-criticism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEQ-SC(^a)</td>
<td>17.08</td>
<td>.57</td>
<td>29.88</td>
<td>1.00**</td>
</tr>
<tr>
<td>PSI-SC</td>
<td>2.00</td>
<td>.17</td>
<td>12.00</td>
<td>.56**</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SDS</td>
<td>6.65</td>
<td>.34</td>
<td>19.74</td>
<td>.82**</td>
</tr>
<tr>
<td>CES-D</td>
<td>4.60</td>
<td>.25</td>
<td>18.74</td>
<td>.87**</td>
</tr>
<tr>
<td>DASS-D</td>
<td>2.77</td>
<td>.19</td>
<td>14.57</td>
<td>.83**</td>
</tr>
</tbody>
</table>

Note. N = 424. Anxiety 1, 2, 3 = three parcels from the Anxiety subscale of Experiences in Close Relationships Scale; Avoid 1, 2, 3 = three parcels from the Avoidance subscale of the Experiences in Close Relationships Scale; DEQ-D = Dependence subscale from the Depressive Experiences Questionnaire; PSI-D = Dependence subscale from the Personal Styles Inventory II; DEQ-SC = Self-Criticism subscale from the Depressive Experiences Questionnaire; PSI-SC = Perfectionism/Self-Criticism subscale from the Personal Styles Inventory II; SDS = Self-Rating Depression Scale; CES-D = Center for Epidemiologic Studies Depressed Mood Scale, short form; DASS-D = Depression subscale from the Depression, Anxiety, and Stress Scale, short form.

\(^a\)Because the standardized loading for the DEQ-SC was greater than one and the error for its error term was negative (note: the error term should not be negative), we fixed the error term for this variable to be zero in order to resolve this issue. Therefore, the standardized loading for the variable of DEQ-SC was one (i.e., an error for this variable was fixed to be zero).

\(^{**}p < .01.\)

(i.e., with this direct path from attachment avoidance to depressive symptoms) was a better model than Model C without this direct path.
Finally, the third alternative (Model D in Table 4) constrains the direct path from attachment anxiety to depressive symptoms to zero (i.e., fully mediated model for attachment anxiety but partially mediated model for attachment avoidance). The nonsignificant result, $\Delta \chi^2 (1, N = 424) = 2.99, p > .05$, revealed that the direct path from attachment anxiety to depressive symptoms did not contribute significantly to the model. Based on the rules of parsimony, Model D (i.e., without the direct path from attachment anxiety to depressive symptoms) should be chosen over Model A (i.e., with this direct path). Therefore, Model D (see Figure 2) was used in the bootstrap method for examining the significance of indirect effects.

**Bootstrapping**

Several scholars have recommended using a bootstrap method for testing the level of significance for indirect effects (e.g., Mallinckrodt, Abraham, Wei, & Russell, 2006; Shrout & Bolger, 2002). The bootstrap method is a data resampling procedure to empirically create bootstrap samples (e.g., 1,000 samples) from the original data. The confidence interval (CI) is used to determine whether the indirect effects are significant (e.g., Shrout & Bolger, 2002). A total of 1,000 bootstrap samples were created and a 95% CI was used to examine the significance of our indirect effect estimates. That is, for an alpha level of .05, the 2.5 and 97.5 percentile values provided the lower and upper limits, respectively, for the CI of the indirect effect. When the 95% CI did not include zero, the indirect effect was considered significant at the .05 level (Shrout & Bolger, 2002).

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attachment anxiety</td>
<td>—</td>
<td>.13**</td>
<td>.61**</td>
<td>.47**</td>
<td>.42**</td>
</tr>
<tr>
<td>2. Attachment avoidance</td>
<td>—</td>
<td>—</td>
<td>.26**</td>
<td>.28**</td>
<td>.24**</td>
</tr>
<tr>
<td>3. Dependence</td>
<td>—</td>
<td>—</td>
<td>.01</td>
<td>.27**</td>
<td></td>
</tr>
<tr>
<td>4. Self-criticism</td>
<td>—</td>
<td>—</td>
<td></td>
<td>.61**</td>
<td></td>
</tr>
<tr>
<td>5. Depressive symptoms</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 424.*

**p < .01.

Table 3

Correlations Among Latent Variables for the Measurement Model
### Table 4
Standardized Structural Paths, Chi-Square, and Fit Indices Among Different Models

<table>
<thead>
<tr>
<th>Path Coefficients and Fit Indices</th>
<th>Model A</th>
<th>Model B</th>
<th>Model C</th>
<th>Model D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachment anxiety → attachment dependence</td>
<td>.66**</td>
<td>.66**</td>
<td>.66**</td>
<td>.65**</td>
</tr>
<tr>
<td>Attachment avoidance → attachment avoidance dependence</td>
<td>− .35**</td>
<td>− .33**</td>
<td>− .33**</td>
<td>− .35**</td>
</tr>
<tr>
<td>Attachment anxiety → attachment anxiety self-criticism</td>
<td>.44**</td>
<td>.44**</td>
<td>.44**</td>
<td>.44**</td>
</tr>
<tr>
<td>Attachment avoidance → attachment avoidance self-criticism</td>
<td>.23**</td>
<td>.23**</td>
<td>.23**</td>
<td>.23**</td>
</tr>
<tr>
<td>Dependence → attachment dependence depressive symptoms</td>
<td>.39**</td>
<td>.24**</td>
<td>.25**</td>
<td>.28**</td>
</tr>
<tr>
<td>Self-criticism → attachment self-criticism depressive symptoms</td>
<td>.62**</td>
<td>.60**</td>
<td>.61**</td>
<td>.56**</td>
</tr>
<tr>
<td>Attachment anxiety → attachment anxiety depressive symptoms</td>
<td>− .13</td>
<td>—</td>
<td>− .02</td>
<td>—</td>
</tr>
<tr>
<td>Attachment avoidance → attachment avoidance depressive symptoms</td>
<td>.18**</td>
<td>—</td>
<td>—</td>
<td>.15**</td>
</tr>
<tr>
<td>Standard $\chi^2$</td>
<td>221.06</td>
<td>233.93</td>
<td>233.85</td>
<td>223.69</td>
</tr>
<tr>
<td>Scaled $\chi^2$</td>
<td>178.73</td>
<td>185.76</td>
<td>184.98</td>
<td>181.27</td>
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<tr>
<td>df</td>
<td>56</td>
<td>58</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td>CFI</td>
<td>.97</td>
<td>.96</td>
<td>.96</td>
<td>.97</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.07</td>
<td>.07</td>
<td>.07</td>
<td>.07</td>
</tr>
<tr>
<td>CI for RMSEA</td>
<td>.06, .08</td>
<td>.06, .08</td>
<td>.06, .08</td>
<td>.06, .08</td>
</tr>
<tr>
<td>SRMR</td>
<td>.07</td>
<td>.08</td>
<td>.08</td>
<td>.07</td>
</tr>
<tr>
<td>Δ corrected scaled $\chi^2$ (df)</td>
<td>A vs. B A vs. C A vs. D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.81(2)* 4.57(1)* 2.99(2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $N = 424$. Boldface type represents best model; dashes indicate that the paths were constrained to zero. Model A = the hypothesized structural model (see Figure 1) in which every structural path was estimated; Model B = the direct paths from attachment anxiety and attachment avoidance to depressive symptoms were constrained to zero; Model C = the direct path from attachment anxiety to depressive symptoms was constrained to zero; Model D (the best fit model; see Figure 2) = the direct path from attachment anxiety to depressive symptoms was constrained to zero. CFI = comparative fit index; RMSEA = root-mean-square error of approximation; CI = confidence interval; SRMR = standardized root-mean-square residual. *$p < .05$. **$p < .01$. 

Attachment and Depressive Symptoms

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As expected, the first set of mediation hypotheses was confirmed. The indirect effects of attachment anxiety on depressive symptoms through dependence \(b = .21\) [95% CI: .14, .28], \(\beta = .65 \times .28 = .18\) and through self-criticism \(b = .28\) [95% CI: .21, .36], \(\beta = .44 \times .56 = .25\) were significant. Moreover, these results also supported the second set of mediation hypotheses. The indirect effects of attachment avoidance on depressive symptoms through dependence \(b = -15\) [95% CI: –.23, –.10], \(\beta = - .35 \times .28 = - .10\) and through self-criticism \(b = .20\) [95% CI: .13, .29], \(\beta = .23 \times .56 = .13\) were significant.²

Finally, 49% of the variance in dependence was explained by attachment anxiety and avoidance, 27% of the variance in self-criticism.

² It is important to note that with only the dependence mediator in the model (i.e., attachment anxiety and avoidance → dependence → depression), the indirect effect from attachment avoidance through dependence to depression implied a suppression effect. The reason is that the path coefficient for attachment avoidance → depression was \(\beta = .18, p < .01\), after controlling for attachment anxiety. When dependence was added into the model, the path coefficient for attachment avoidance → depression was increased from \(\beta = .18, p < .01\) to \(\beta = .23, p < .01\).
cism was explained by attachment anxiety and avoidance, and 47% of the variance in depressive symptoms was explained by attachment avoidance, dependence, and self-criticism in the final structural model (see Figure 2).³

Sex Comparison

The final structural model (see Figure 2) was used to examine the invariance of path coefficients for structural paths by conducting a multiple-group comparison analysis for women (n = 263) and men (n = 159). We compared two models, one in which the path coefficients were allowed to vary (i.e., the free model) and one in which the path coefficients were constrained to be equal (i.e., the equal model) for women and men. The corrected scaled chi-square difference test was used to determine whether these two were equivalent. The results indicated a significant difference, Δχ² (7, N = 422) = 18.43, p = .01, between these two models, implying that the path coefficients were significantly different for women and men. Thus, we further examined which specific paths were different between women and men. The results showed only the path coefficient from attachment avoidance to self-criticism was significantly different, Δχ² (1, N = 422) = 5.76, p = .02, for women and men. Specifically, the association between attachment avoidance and self-criticism was stronger for men (β = .37, p < .01) than for women (β = .13, p < .05; see Figure 2).

DISCUSSION

The current results generally support the expected mediation effects by demonstrating dependence and self-criticism as significant medi-

³. Two possible alternative models were explored. The first alternative model was a model of personal styles (i.e., dependence and self-criticism) → attachment (i.e., anxiety and avoidance) → depressive symptoms. The results indicated that attachment avoidance was a significant mediator between personal styles (i.e., dependence and self-criticism) and depressive symptoms, whereas attachment anxiety failed to be a significant mediator between these variables. The second alternative model was to explore a model of personal styles (i.e., dependence and self-criticism) → depressive symptoms → attachment (i.e., anxiety and avoidance). The results showed that depressive symptoms were a significant mediator between personal style (i.e., dependence and self-criticism) and attachment avoidance.
ators between attachment anxiety and avoidance and depressive symptoms. First, the results supported the prediction that dependence would mediate the association between attachment anxiety and depressive symptoms. Specifically, the results showed that attachment anxiety was positively correlated with dependence, which is similar to previous results in the literature (Murphy & Bates, 1997; Reis & Grenyer, 2002; Zuroff & Fitzpatrick, 1995). Theoretically, major features of attachment anxiety are the desire for interpersonal closeness, the fear of interpersonal rejection or abandonment (Brennan et al., 1998), as well as a negative internal working model of the self. Therefore, these individuals may develop a dependent tendency in order to ensure others’ availability and validation. For example, Mongrain and Zuroff (1995) reported that dependent individuals in their study tended to focus more of their daily energies on interpersonal goals such as searching for closeness. Those individuals who exhibit these preoccupations may be at greater risk for depressive symptoms. It is possible that as other areas of functioning are overlooked or not satisfied, the individual is continually frustrated at this major focus of his or her life (i.e., interpersonal closeness). This leaves the individual with fewer resources to fall back on compared to peers without these preoccupations, ultimately increasing his or her susceptibility to depressive symptoms.

Conversely, those with higher levels of attachment avoidance, it seems, may actually be able to prevent depressive symptoms by avoiding dependence. This result is consistent with previous research findings (Murphy & Bates, 1997; Zuroff & Fitzpatrick, 1995). This result also confirms the theoretical perspective that those with higher levels of attachment avoidance tend to have a negative working model of others (Pietromonaco & Feldman Barrett, 2000) and perhaps have learned that others are untrustworthy. As a result, they have learned to rely on themselves, instead of depending on others, to prevent hurt or disappointment (Fraley, Davis, & Shaver, 1998).

Secondly, the finding that self-criticism serves as a mediator between attachment anxiety and depressive symptoms was also expected. This positive relation is consistent with previous research (e.g., Murphy & Bates, 1997). As described earlier, those with higher levels of attachment anxiety tend to develop a negative internal working model of the self (Bartholomew, 1990; Bartholomew & Horowitz, 1991; Bowlby, 1973, 1979). Perhaps they internalize these negative internal models of self and begin to automatically engage in
self-criticism without awareness. This constant and harsh self-evaluation may serve as motivation for self-improvement, thus reducing the chances of being criticized by others (Blatt & Homann, 1992), and may increase the chances of gaining approval, respect, and admiration from others (Zuroff & Fitzpatrick, 1995). However, even though they are unaware of their own self-criticism or their striving for others’ acceptance through harsh self-evaluation, engaging in self-criticism is likely to put them at an increased vulnerability for depressive symptoms.

In addition, the results also supported the hypothesis that the association between attachment avoidance and depressive symptoms is partially mediated by self-criticism. Specifically, attachment avoidance was positively correlated with self-criticism, which is consistent with previous empirical results (Reis & Grenyer, 2002; Zuroff & Fitzpatrick, 1995). Attachment avoidance is theorized to develop as a result of rejecting or unresponsive caregiving in early life (Bowlby, 1980). Thus, these individuals tend to develop a negative view of others and may develop beliefs surrounding the need to be highly competent or nearly flawless at tasks in life in order to maintain self-reliance rather than risk further rejection. Unfortunately, self-criticism is likely to increase vulnerability for depressive symptoms (Murphy & Bates, 1997), a high price to pay for the anticipated safety of self-reliance.

Interestingly, the results indicated that the association between attachment avoidance and self-criticism was stronger for men than for women. It is possible that men with a high level of attachment avoidance are more likely to engage in self-criticism than women because men are more likely to strive for achievement than women (Kirsch & Kuiper, 2002; Stoppard, 1999). In addition, Mongrain and Zuroff (1995) reported that self-critical subjects reported a depressive response related not only to achievement failure but also to interpersonal rejection. Therefore, it is also possible that men with a high level of attachment avoidance are more likely to report a high level of self-criticism because men may be less competent than women when dealing with relationship failure or developing meaningful interpersonal relationships.

**Limitations and Future Research**

There are some limitations to keep in mind when interpreting these results. The ethnic makeup of the university that the sample was drawn from has put limitations on the diversity of the sample. The
The majority of this sample was Caucasian (73%), which possibly reduces the generalizability of the results. In particular, previous findings have indicated that attachment dimensions manifest in different ways on negative mood (i.e., depressive symptoms and anxiety) across ethnic groups within the United States (Wei, Russell, Mallinckrodt, & Zakalik, 2004). Therefore, caution needs to be taken when generalizing the current results to other ethnic groups. We also acknowledge that our cross-sectional data are limited in defining the causal relations implied by the mediational model (Cole & Maxwell, 2003). For example, the mediators may just be additional covariate variables rather than mediators (for a discussion, see Cole & Maxwell, 2003). Thus, the certainty about the mediation results cannot be ensured mathematically in this cross-sectional design.

Future studies need to be longitudinal to more definitively define these relationships. However, as we know, researchers often collect cross-sectional data first to confirm theoretical relationships before investing time, expense, and other resources in rigorous longitudinal or intervention studies. Our cross-sectional study, at least, can serve as a foundational starting point to future examinations. For example, researchers can develop a prospective study design to examine whether attachment at Time 1 predicts dependence and self-criticism at Time 2, ultimately predicting depressive symptoms at Time 3.

Moreover, the literature would be greatly strengthened by an intervention study designed to help participants learn to manage dependence or self-criticism (e.g., daily diary research study where participants recall their dependent and self-critical thoughts and behaviors). In addition, an experimental design that manipulated the variables of interest would help us to understand the mediation process more fully and might serve to solidify the known variable relationships. Finally, since several mediators between attachment and depressive symptoms have been explored in previous studies, future studies should move toward combining these known mediators into a single study in order to examine the “big picture” (i.e., the unique contribution of each mediator).

Implications

Our results imply that different attachment dimensions (anxiety vs. avoidance) may pass through different mediating pathways (e.g., dependence) to depressive symptoms. For example, those with high
levels of attachment anxiety may experience inconsistent care from others, which increases their preoccupation with and dependence on others. However, because of their negative internal working model of others, those with high levels of attachment avoidance actually avoid dependence, ultimately reducing their vulnerability for depressive symptoms.

As attachment quality may take a long time to change, people can learn to manage their dependence and self-criticism to lessen depressive symptoms. For managing dependence, people can first explore what the positive underlying purposes of dependence (e.g., intimacy needs) are. They then can use their internal (e.g., depending on self or self-care) or external (e.g., building stable interpersonal relationship) resources to get their needs met. This may be especially important for those high in dependence because their moods are often dependent on the reactions of important others (e.g., as the self is unable to be regulated through self-soothing). Also, people can develop effective negotiation strategies (e.g., directly letting others know their needs) to deal with their dependence.

In the same vein, to manage self-criticism, people can explore the positive motivations or psychological needs (e.g., others will accept me if I succeed) as well as negative consequences (e.g., depressive symptoms) of self-criticism. They can then use cognitive-behavioral techniques to increase their awareness and catch themselves in the act of destructive self-critical practices. Finally, they can begin to learn and utilize alternative strategies (e.g., self-acceptance) to meet their needs instead of the harmful strategy of self-criticism (for a discussion, see Bergner, 2008).

REFERENCES


