

Adult Attachment, Shame, Depression, and Loneliness: The Mediation Role of Basic Psychological Needs Satisfaction

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This study examined basic psychological needs satisfaction (i.e., the need for autonomy, competence, and relatedness) as a mediator between adult attachment (i.e., anxiety and avoidance) and distress (i.e., shame, depression, and loneliness). A total of 299 undergraduates from a Midwestern university participated. Results from structural equation modeling analysis indicated that basic psychological needs satisfaction partially mediated the relationship between attachment anxiety and shame, depression, and loneliness and fully mediated the relationship between attachment avoidance and shame, depression, and loneliness. Bootstrap methods were used to assess the magnitude of these indirect effects. Attachment anxiety and avoidance explained 35% of the variance in basic psychological needs satisfaction, and attachment anxiety and basic psychological needs satisfaction explained 51%, 72%, and 74% of the variance in shame, depression, and loneliness, respectively.

Keywords: adult attachment, depression, loneliness, basic psychological needs satisfaction, mediation

Over the past decade, researchers have become increasingly interested in examining the mediators of the relationship between attachment and psychological (e.g., shame and depression) and interpersonal distress (e.g., loneliness). In particular, several counseling psychology researchers have begun to apply attachment theory to understand individual differences in the counseling process (e.g., Lopez, 1995; Lopez & Brennan, 2000; Mallinckrodt, 2000). Studies of mediators of the relationship between attachment and distress are particularly important for counseling psychologists because if mediators (e.g., effective coping or basic psychological needs satisfaction) between attachment and depression are found, then counseling psychologists can target these mediators with interventions (e.g., increasing effective coping or meeting basic psychological needs) to help individuals relieve their depression instead of attempting to alter their quality of attachment, which is a more difficult process (e.g., Bowlby, 1988).

In the attachment literature, attachment anxiety and avoidance have been positively related to several indices of psychological distress such as shame, anger, and pathological narcissism (Wagner & Tangney, 1991), depression and anxiety (e.g., Lopez, Mauricio, Gormley, Simko, & Berger, 2001; Wei, Heppner, & Mallinckrodt, 2003; Wei, Mallinckrodt, Russell, & Abraham, 2004), negative affect (e.g., Simpson, 1990), emotional distress and nervousness (Collins, 1996), and general distress symptoms (Lopez, Mitchell, & Gormley, 2002). Moreover, attachment anx-

iety and avoidance have been shown to be positively related to interpersonal difficulties (e.g., Bartholomew & Horowitz, 1991; Horowitz, Rosenberg, & Bartholomew, 1993), increased feelings of loneliness (e.g., Hecht & Baum, 1984; Kobak & Sceery, 1988; Shaver & Hazan, 1989; Wei, Vogel, Ku, & Zakalik, 2005), and greater hostility toward others (e.g., Mikulincer, Hirschberger, Nachmias, & Gillath, 2001; Mikulincer & Shaver, 2001). In addition to the above direct associations between attachment and distress, researchers have begun to explore the indirect effects (e.g., mediation effects) beyond these direct associations. To date, studies have identified several mediators of the relationship between attachment and distress such as dysfunctional attitudes and low self-esteem (Roberts, Gotlib, & Kassel, 1996), ineffective coping (Lopez et al., 2001; Wei et al., 2003), self-splitting and self-concealment (Lopez et al., 2002), maladaptive perfectionism (Wei et al., 2004), social competencies and emotional awareness (Mallinckrodt & Wei, 2005), and emotional reactivity and emotional cutoff (Wei et al., 2005).

Most of these studies have taken a pathology-based approach by exploring maladaptive strategies (e.g., maladaptive perfectionism) as mediators between attachment and distress. This makes sense because one reason for seeking counseling is to learn how to cope with dysfunction in one's daily life. However, changing dysfunctional tendencies (e.g., stopping maladaptive perfectionism) does not guarantee that people will function well, as some dysfunctional strategies may have adaptive functions (e.g., meeting basic psychological needs). For example, perfectionism may serve to protect individuals whose attachment figures do not adequately respond to their needs. Individuals may come to believe that, if they are perfect, people will respect them (fulfilling a need for autonomy), view them as capable (fulfilling a need for competence), and like them (fulfilling a need for relatedness). This implies that the use of maladaptive strategies stems from a failure to meet basic psychological needs. Unless these needs are satisfied, altering maladaptive strategies may be ineffective, as individuals may

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continue attempting to meet their basic needs through ineffective strategies (e.g., Deci & Ryan, 2000; Ryan & Deci, 2000). They may either develop different maladaptive strategies or relapse to their old maladaptive strategies (e.g., maladaptive perfectionism). Also, if individuals believe their maladaptive strategies are the only ways to meet their psychological needs, then they may choose not to give up these strategies, despite the negative psychological consequences.

One possible solution is to not only focus on changing a maladaptive coping strategy but also to focus on helping the individual learn how to better satisfy their basic psychological needs. Counseling psychologists tend to focus on individuals' strengths to increase their adaptation to their daily lives (Gelso & Fretz, 2001). Assisting clients by not just focusing on giving up a maladaptive strategy but by helping them develop more effective, healthy strategies that meet their basic needs is entirely consistent with this mission. Therefore, it is important for researchers to examine whether individuals with high levels of attachment anxiety and avoidance can decrease their distress levels by better satisfying their psychological needs.

Ryan and Deci (2000) argued that autonomy, competence, and relatedness are three fundamental psychological needs. Sheldon, Elliot, Kim, and Kasser (2001), in their three studies regarding 10 psychological needs, found that these three needs were rated among the four most important needs across three samples of U.S. college students in a predominantly White university and in one sample of South Korean college students. However, South Korean college students scored higher on the need for relatedness than did U.S. college students.

The need for autonomy involves the desire for a sense of self-direction and feelings of volition, vitality, and initiative (Deci & Ryan, 1985, 2000; Ryan, 1993; Ryan & Deci, 2000). The need for competence taps a person's feelings of curiosity and desire for efficacy (Deci, 1975; Deci & Ryan, 1985, 2000; White, 1959). The need for relatedness concerns the tendency toward closeness to others and the desire for a feeling of connection with others (Deci & Ryan, 1985, 2000; Ryan & Deci, 2000). According to attachment theory, if caregivers are sensitive to their children's signals of emotional or physical needs, then children may experience a sense of felt security. This secure base helps children to explore their environment with self-confidence, build a sense of autonomy and self-competence, and feel a sense of closeness with others (e.g., Pietromonaco & Feldman Barrett, 2000; Sroufe & Waters, 1977). It seems that attachment theory suggests that when individuals experience a sense of secure attachment, they are likely to experience the satisfaction of their basic psychological needs for autonomy, competence, and relatedness.

Some empirical research has provided indirect empirical evidence for the association between parental attachment and perceived basic psychological needs satisfaction. In a study of elementary-age children, Avery and Ryan (1988) found that children's level of attachment security was positively related to their perceptions of their parents as supportive of their autonomy and relatedness needs. Similarly, Ryan and Lynch (1989) found a positive relationship between adolescents' willingness to be close to and rely on their parents and their experience of their parents as high in autonomy support, acceptance, and warmth. However, very few studies have examined the association between adult attachment and perceived satisfaction of basic psychological needs for

autonomy, competence, and relatedness. This is surprising given that, even for adults, basic psychological needs satisfaction is important (Ryan & Deci, 2000). One study that examined this association was conducted by La Guardia, Tyan, Couchman, and Deci (2000), who found that a general sense of attachment security was positively associated with college students' satisfaction of their basic psychological needs for autonomy, competence, and relatedness.

Ryan and Deci (2000) proposed that, at all ages, the basic psychological needs for autonomy, competence, and relatedness must be satisfied in order for an individual to experience a sense of growth, integrity, and well-being. Sheldon, Ryan, and Reis (1996) indicated that daily fluctuations in the satisfaction of needs for autonomy and competence predicted fluctuations in daily well-being for American college students. In subsequent studies, Reis, Sheldon, Gable, Roscoe, and Ryan (2000) found that the autonomy, competence, and relatedness needs were positively associated with positive mood and psychological vitality (feeling physically and mentally vigorous and alert), whereas the competence need was significantly negatively associated with negative mood and symptoms for American college students. Furthermore, Deci et al. (2001), revealed that overall basic psychological needs satisfaction was positively associated with a greater level of self-esteem but negatively associated with anxiety symptoms for Bulgarian and American workers. In summary, it appears that basic psychological needs satisfaction is positively associated with well-being, positive mood, and psychological vitality. Conversely, basic psychological needs satisfaction is negatively associated with negative mood or anxiety symptoms.

From the above review, it appears that there are relationships between attachment, basic psychological needs satisfaction, and well-being or distress. It is possible that individuals with attachment security are likely to experience satisfaction of their basic psychological needs of autonomy, competence, and relatedness and, in turn, decrease their experience of feeling ashamed, depressed, and lonely. However, from our search of the literature, there is only one article that has attempted to include these three concepts together. La Guardia et al. (2000) conducted two studies and found that overall basic psychological needs satisfaction (a composite score of autonomy and competence needs) was a mediator between global attachment security and well-being. La Guardia et al. explained that attachment security is associated with well-being because others are able to satisfy an individual's innate or basic psychological needs within the context of secure relationships. It is important to note here that published research related to the link between attachment and psychological basic needs satisfaction is limited to one study by La Guardia et al. Because of the lack of information in the literature to inform us of any specific psychological needs with attachment or distress, the present study was planned to explore the overall basic psychological needs satisfaction instead of any specific psychological needs. Deci et al. (2001) successfully used basic needs satisfaction of autonomy, competence, and relatedness as three indicators for the latent variable of needs satisfaction in their study related to work climate and environment. In the present study, we replicate Deci and colleagues' method of studying the working climate and environment to measure basic needs satisfaction in everyday life.

Brennan, Clark, and Shaver (1998) recently integrated all available adult attachment measures, conducted a factor analysis of

over 300 items, and developed a comprehensive adult attachment measure. They indicated that adult attachment orientations could be described in terms of two orthogonal dimensions: attachment anxiety and attachment avoidance. *Adult attachment anxiety* is defined as the fear of rejection and abandonment. Individuals with attachment anxiety tend to develop a negative internal working model of self (Pietromonaco & Feldman Barrett, 2000). In contrast, *adult attachment avoidance* is characterized by a fear of intimacy and discomfort with closeness and dependence. Individuals with attachment avoidance are likely to have a negative working model of others (Pietromonaco & Feldman Barrett).

In the present study, we were interested in expanding on previous research by (a) using a more comprehensive adult attachment measure, (b) developing a more complex conceptual model, (c) using a more powerful statistical technique such as structural equation modeling, and (d) focusing on a positive mediator for the association between attachment and distress. Ideally, the mediator should be something that can be changed or modified in counseling (MacKinnon, Krull, & Lockwood, 2000). It makes sense that meeting basic psychological needs is something that can be targeted with an intervention to help individuals with insecure attachment decrease their distress. In selecting the indices of distress in the present study, we were particularly interested in examining shame, depression, and loneliness. As stated above, shame has been linked with attachment (e.g., Wagner & Tangney, 1991). Wheeler (1996) defined shame as a belief in the unacceptability of personal needs, characteristics, and desires in a social relationship. From this definition, shame is likely to be associated with basic needs dissatisfaction. Additionally, attachment has been frequently linked to depression (e.g., Wei et al., 2004) and loneliness (e.g., Kobak & Sreery, 1988) in the literature. Through the indirect empirical evidence of negative associations between basic needs

satisfaction and negative mood (e.g., Reis et al., 2000), there is a high probability that basic needs satisfaction will be negatively associated with depression and loneliness as well. Therefore, we examine whether basic psychological needs satisfaction would serve as a mediator of the relationship between attachment (i.e., anxiety and avoidance) and distress (i.e., shame, depression, and loneliness) using structural equation modeling (see Figure 1).

Method

Participants

This study involved 299 undergraduate students enrolled in psychology classes at a large Midwestern university. The sample included 203 (68%) women and 96 (32%) men. Of the participants, 124 (42%) were freshmen, 112 (38%) were sophomores, 41 (14%) were juniors, and 19 (6%) were seniors. Three (1%) participants did not indicate their class standing. The mean age of this sample was 19.73 years ($SD = 2.92$ years; range = 18–38 years). Participants were predominantly Caucasian American (81.3%), with a smaller number being Asian American (5.7%), African American (4.7%), Hispanic American (4.3%), international student (1.7%), multiracial American (1%), and Native American (0.3%), 2 indicated “other” for their ethnic background, and 1 did not answer this item. With regard to marital status, 148 (49.5%) were single, 131 (43.8%) were in a committed relationship, 3 (1.0%) were married, 1 (0.3%) was divorced or separated, 5 (1.7%) indicated “other” for their marital status, and 11 (3.7%) did not respond to this question.

Measures

Attachment. The Experiences in Close Relationships Scale (ECRS; Brennan et al., 1998) was used to measure adult attachment. The ECRS was derived from the 14 attachment measures (60 subscales and 323 items) available at that time and involved data from over 1,000 participants. The

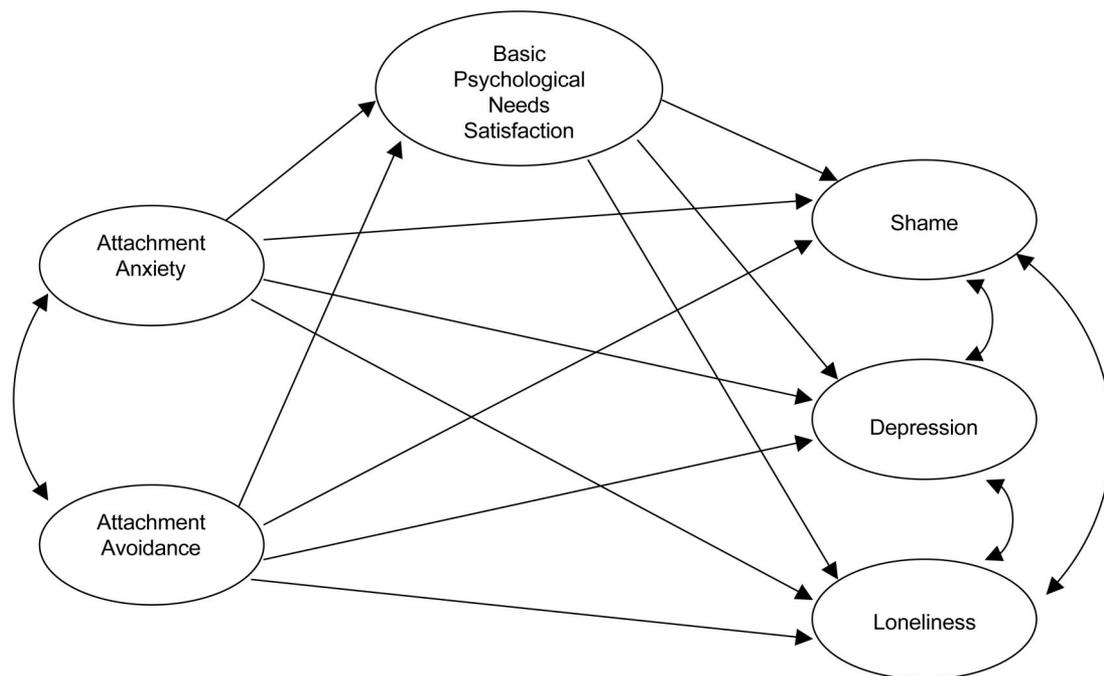


Figure 1. The theoretical model.

ECRS is a 36-item self-report measure of adult attachment with two subscales, Anxiety and Avoidance. The Anxiety subscale (18 items) taps fears of rejection and abandonment, whereas the Avoidance subscale (18 items) assesses fear of intimacy and discomfort with closeness or dependence. Participants rate how well each statement describes their typical feelings in romantic relationships on a 7-point Likert-type scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). Scores range from 7 to 126 for Anxiety and Avoidance, respectively. Higher scores on the Anxiety and Avoidance subscales indicate higher attachment anxiety and attachment avoidance, respectively. Brennan et al. reported coefficient alphas of .91 and .94 for the Anxiety and Avoidance subscales, respectively. The present study obtained coefficient alphas of .93 for each subscale. Brennan et al. reported that the ECRS correlated positively with self-report measures of touch and postcoital emotions. It is important to note that we conduct a structural equation modeling with latent variables in the present study in order to rule out the measurement errors. A general rule in this process is to have at least three observed indicators for each latent variable (Kenny, Kashy, & Bolger, 1998). In order to create three observed indicators for each of the two latent variables of attachment anxiety and attachment avoidance, we followed the recommendations of Russell, Kahn, Spoth, and Altmaier (1998). First, separate exploratory factor analyses were conducted for each of the two subscales (Anxiety and Avoidance) of the ECRS using the maximum-likelihood method to extract a single factor. We then rank ordered the items on the basis of the magnitude of their factor loadings and separated the items into three groups on the basis of the magnitude of their loadings so as to equalize the average loadings of the items in each group. We then created three measured variables by averaging responses to each of the three sets of items. These three measures were then used as the three measured indicators for the two latent variables, attachment anxiety and attachment avoidance.

Basic Psychological Needs Satisfaction. The Basic Psychological Needs Satisfaction Scale-general version (BPNS-general version) is adapted from the Basic Psychological Needs Satisfaction-work version (Ilardi, Leone, Kasser, & Ryan, 1993). The BPNS-general version contains 21 items, which measure satisfaction of three psychological needs: autonomy (7 items), competence (6 items), and relatedness (8 items). Participants respond on a 7-point Likert scale ranging from 1 (*not true at all*) to 7 (*very true*), regarding how well each psychological need is generally satisfied in their life. Scores range from 7 to 49 (autonomy), from 6 to 42 (competence), from 8 to 56 (relatedness), and from 21 to 147 (total score). Higher scores reflect greater satisfaction. Gagné (2003) reported coefficient alphas of .69, .71, and .86 for the autonomy, competence, and relatedness scores, respectively. For the present study, coefficient alphas were .68, .75, .85, and .90 for the Autonomy, Competence, and Relatedness subscales and the total score, respectively. Gagné also reported that satisfaction of the three basic psychological needs were positively associated with mother and father autonomy support. In the present study, the three subscales were used as the three measured indicators of the psychological needs satisfaction latent variable.

Shame. The Shame scale from the Harder Personal Feelings Questionnaire (PFQ; Harder & Zalma, 1990) was used to measure this negative emotion. The Shame scale is a 10-item self-report measure that is designed to assess shame proneness. Participants were asked to respond to items using a scale ranging from 0 (*never*) to 4 (*continuously or almost continuously*). The score ranges from 0 to 40, with higher scores on the Shame scale indicating greater degrees of shame. Harder and Zalma reported a coefficient alpha of .78 and test-retest reliability (2-week interval) of .91 for the Shame scale. In the present study, the coefficient alpha was .73. Construct validity was evidenced by a positive association with depression (Harder & Zalma). Three observed indicators for the latent variables of shame were created in a manner similar to that used to obtain observed indicators for the attachment anxiety and avoidance latent variables.

Depression. Depression was measured with the Center for Epidemiological Studies-Depression Scale (CES-D), the Self-Rating Depression

Scale (SRDS), and the Depression subscale from the Depression, Anxiety, and Stress Scale-short version (DASS-short version).

The CES-D (Radloff, 1977) is a 20-item scale measuring current levels of depressive symptoms. Participants respond to items on a 4-point Likert 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]), based on the frequency with which the item has reflected participants' experiences during the past week. Scores range from 0 to 60, with higher scores indicating higher levels of depressive mood and symptoms. The coefficient alpha within a nonclinical sample has been reported as .85. A coefficient alpha of .92 was obtained in the present study. Convergent validity has been established through positive correlations with the Beck Depression Inventory ($r = .86$; Santor, Zuroff, Ramsay, Cervantes, & Palacios, 1995).

The SRDS (Zung, 1965) is a 20-item measure assessing three basic categories of depressive symptoms: pervasive affect, physiological features, and psychological concomitants. The measure contains two sets of 10 items that are either symptomatically positive or symptomatically negative. Participants rate how often they experience each item on a 4-point Likert scale ranging from 1 (*some or a little of the time*) to 4 (*most or all of the time*). Scores range from 20 to 80, with higher scores reflecting more depressive symptoms. Passik et al. (2001) reported a coefficient alpha of .84. The coefficient alpha in the present study was .85. Zung reported that the SRDS has demonstrated convergent validity via positive correlations with scores on other measures of depression.

The Depression subscale of the DASS-short version (Lovibond & Lovibond, 1995) comprises seven statements measuring depression. Participants rate how much the statement applied to them over the previous week using a 4-point response scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). The scale comprises seven primary symptoms, with scores ranging from 0 to 21. Higher scores indicate higher levels of depression. Lovibond and Lovibond reported coefficient alphas of .96 for the Depression subscale. The present study obtained a coefficient alpha of .91 for the Depression subscale. The Depression subscale of the DASS-short version has been shown to correlate highly with the Beck Depression Inventory (Antony, Bieling, Cox, Enns, & Swinson, 1998). Scores on these three depression measures were used as the three measured indicators for the depression latent variable.

Loneliness. Loneliness was measured with the UCLA Loneliness Scale-Version 3 (Russell, 1996). The UCLA Loneliness scale-Version 3 is a 20-item scale that measures levels of loneliness in everyday life. It includes 9 positive (nonlonely) and 11 negative (lonely) items, randomly distributed throughout the instrument. Participants rate each item on a 4-point Likert scale ranging from 1 (*never*) to 4 (*always*). Scores on the scale range from 20 to 80, with higher scores reflecting greater loneliness. Russell reported that Version 3 of the scale appears to be reliable, with coefficient alphas ranging from .89 to .94 across samples. The present study produced a coefficient alpha of .94. The scale's convergent validity was supported by positive correlations with scores on other measures of loneliness such as the NYU Loneliness Scale and the Differential Loneliness Scale (Russell). Construct validity was supported through positive associations with depression and neuroticism as well as through negative associations with several measures of social support and self-esteem (Russell). Three indicators were created for the loneliness latent variable using the same method that was used in creating the three measured indicators for the attachment anxiety and avoidance latent variables.

Procedure

Individual packets containing each questionnaire were administered to small groups of students (5–30 participants each) who signed up for one of several data collection times. The participants were informed that "this project seeks to understand the factors related to close relationships, competence, and mood." The packets required approximately 30–50 min to complete. No personal identifying information was collected, and par-

ticipants were assured of the anonymity of their responses and confidentiality of the data. Participants received extra credit toward their course grade in exchange for participation in the study.

Results

Preliminary Analyses

Means, standard deviations, and zero-order correlations for the 18 measured variables are shown in Table 1. The multivariate normality test was used to examine whether the data met the normality assumptions underlying the maximum-likelihood procedure used to test the models in the present study. The results of the multivariate normality test indicated that the data were not multivariate normal, $\chi^2(2, N = 299) = 381.48, p < .001$. Therefore, scaled chi-square statistics developed by Satorra and Bentler (1988) for adjusting the impact of nonnormality on the results were used.

Measurement Model

Before a structural model is tested, Anderson and Gerbing (1988) suggested conducting a confirmatory factor analysis to examine whether the measurement model provides an acceptable fit to the data. Once an acceptable measurement model is developed, the structural model can be tested. In this study, the measurement model was estimated using the maximum-likelihood method in the LISREL 8.54 program (Jöreskog & Sörbom, 2003). As suggested by Hu and Bentler (1999), three fit indices were used to assess goodness of fit for the models: the comparative fit index (CFI; values of .95 or greater indicate that the model provides an

adequate fit to the data), the root-mean-square error of approximation (RMSEA; values of .06 or less indicate an adequate fit), and the standardized root-mean-square residual (SRMR; values of .08 or less indicate an adequate fit). As noted above, the Satorra and Bentler (1988) scaled chi-square was reported for adjusting the impact of nonnormality. Finally, the corrected scaled chi-square difference test (Satorra & Bentler, 2001) was used to compare nested models.

An initial test of the measurement model resulted in a relatively good fit to the data, scaled $\chi^2(120, N = 299) = 205.72, p < .001$, CFI = .99, RMSEA = .049 (90% confidence interval [CI]: .037, .060), SRMR = .038. All of the loadings of the measured variables on the latent variables were statistically significant ($p < .001$, see Table 2). Therefore, all of the latent variables appear to have been adequately operationalized by their respective indicators. In addition, correlations among the independent latent variables (i.e., attachment anxiety and attachment avoidance), the mediator latent variable (i.e., basic psychological needs satisfaction), and dependent latent variables (i.e., shame, depression, and loneliness) were all statistically significant ($p < .01$, see Table 3).

Structural Model for Testing Mediated Effects

The structural model was tested using the maximum-likelihood method in the LISREL 8.54 program (Jöreskog & Sörbom, 2003). The results showed a good fit of the model to the data, scaled $\chi^2(120, N = 299) = 205.72, p < .001$, CFI = .99, RMSEA = .049 (90% CI: .037, .060), SRMR = .038. All the structural paths were significant except the paths from attachment avoidance to shame, depression, and loneliness ($\beta_s = .09, -.02$, and $.05$, respectively;

Table 1
Means, Standard Deviations, and Correlations Among 18 Observed Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Anxiety 1	21.97	7.03	—	.80	.82	.07	.04	.15	-.41	-.38	-.29	.29	.35	.50	.52	.48	.54	.53	.42	.45
2. Anxiety 2	20.31	7.24		—	.79	.21	.19	.27	-.46	-.38	-.33	.32	.35	.46	.51	.47	.52	.52	.43	.47
3. Anxiety 3	21.01	6.81			—	.20	.17	.26	-.42	-.37	-.32	.27	.33	.45	.49	.45	.51	.51	.41	.46
4. Avoid 1	17.88	6.37				—	.85	.86	-.29	-.28	-.31	.22	.21	.26	.26	.26	.21	.28	.32	.32
5. Avoid 2	16.42	6.34					—	.84	-.31	-.30	-.33	.23	.20	.24	.24	.26	.19	.27	.33	.33
6. Avoid 3	17.05	6.51						—	-.32	-.28	-.31	.22	.20	.25	.25	.25	.25	.30	.34	.34
7. Autonomy	35.33	5.71							—	.68	.68	-.29	-.35	-.48	-.53	-.63	-.57	-.57	-.60	-.55
8. Competence	30.25	5.60								—	.67	-.25	-.39	-.48	-.57	-.63	-.58	-.61	-.59	-.60
9. Relatedness	45.38	7.34									—	-.28	-.37	-.41	-.51	-.62	-.53	-.69	-.72	-.67
10. Shame 1	3.43	1.70										—	.48	.55	.32	.35	.27	.34	.29	.31
11. Shame 2	3.30	1.87											—	.52	.42	.46	.43	.41	.39	.38
12. Shame 3	4.50	1.91												—	.58	.55	.55	.58	.50	.51
13. CES-D	14.40	10.50													—	.75	.77	.65	.66	.65
14. SRDS	36.24	8.28														—	.74	.64	.66	.65
15. DASSD	3.94	4.28															—	.63	.62	.62
16. UCLA 1	14.15	4.06																—	.80	.82
17. UCLA 2	12.43	3.78																	—	.86
18. UCLA 3	11.17	3.31																		—

Note. $N = 299$. Higher scores on Anxiety 1, 2, 3, and Avoid 1, 2, 3 indicate higher levels of attachment anxiety and attachment avoidance. Higher scores on Autonomy, Competence, and Relatedness indicate higher levels of autonomy, competence, and relatedness. Higher scores on Shame 1, 2, 3 indicate higher levels of shame. Higher scores on the Center for Epidemiological Studies-Depression (CES-D) Scale, Self-Rating Depression Scale (SRDS), and Depression subscale of the Depression, Anxiety, and Stress Scale (DASSD) indicate higher levels of depression. Higher scores on UCLA 1, 2, 3 indicate higher levels of loneliness. Absolute values of correlation greater than or equal to .15 were significant at $p < .05$, to .17 at $p < .01$, and to .21 at $p < .001$. Anxiety 1, 2, 3 = three parcels from the Anxiety subscale of the Experiences in Close Relationships Scale (ECRS); Avoid 1, 2, 3 = three parcels from the Avoidance subscale of the ECRS; Autonomy, Competence, and Relatedness = three subscales from the Basic Psychological Needs Satisfaction Scale; Shame 1, 2, 3 = three parcels from the Shame subscale of the Harder Personal Feelings Questionnaire; UCLA 1, 2, 3 = three parcels from the UCLA Loneliness Scale-Version 3.

Table 2
Factor Loadings for the Measurement Model

Measure and variable	Unstandardized factor loading	SE	Z	Standardized factor loading
Attachment anxiety				
Anxiety Parcel 1	6.42	.32	20.23	.91***
Anxiety Parcel 2	6.41	.34	19.13	.89***
Anxiety Parcel 3	6.07	.33	18.47	.89***
Attachment avoidance				
Avoidance Parcel 1	5.93	.24	24.30	.93***
Avoidance Parcel 2	5.77	.26	22.02	.91***
Avoidance Parcel 3	6.01	.26	22.91	.92***
Basic psychological needs satisfaction				
Autonomy	4.58	.28	16.37	.80***
Competence	4.53	.26	17.62	.81***
Relatedness	6.22	.41	15.06	.85***
Shame				
Shame Parcel 1	1.06	.12	9.21	.63***
Shame Parcel 2	1.20	.12	10.10	.65***
Shame Parcel 3	1.63	.11	14.67	.86***
Depression				
CES-D	9.16	.59	15.55	.87***
SRDS	7.16	.43	16.75	.86***
DASSD	3.69	.27	13.49	.87***
Loneliness				
Loneliness Parcel 1	3.61	.17	20.65	.89***
Loneliness Parcel 2	3.47	.20	17.26	.92***
Loneliness Parcel 3	3.05	.16	18.71	.92***

Note. $N = 299$. Shame 1, 2, 3 = three parcels from the Shame subscale of the Harder Personal Feelings Questionnaire; CES-D = Center for Epidemiological Studies-Depression Scale; SRDS = Self-Rating Depression Scale; DASSD = Depression subscale of the Depression, Anxiety, and Stress Scale.
*** $p < .001$.

$ps > .05$). Therefore, we constrained these three paths to zero to see whether doing so worsened the fit of the model to the data. The results for this modified model (see Figure 2) also showed a very good fit to the data, scaled $\chi^2(123, N = 299) = 210.59, p < .001$, CFI = .99, RMSEA = .049 (90% CI: .037, .060), SRMR = .040.¹ The corrected scaled chi-square difference test (Satorra & Bentler, 2001) used to compare the initial structural model and this modified model indicated no significant difference in the fit for these two models, $\Delta\chi^2(3, N = 299) = 4.57, p = .21$. This suggests that the three direct paths from attachment avoidance to shame, depression, and loneliness did not significantly contribute to the fit of the model.

Testing the Significant Levels of Indirect Effects

Recently, MacKinnon, Lockwood, Hoffman, West, and Sheets (2002) evaluated 14 methods for testing mediation with regard to Type I error and statistical power. They found that the commonly used method recommended by Baron and Kenny (1986) for testing mediation had the least statistical power of the above 14 methods that were examined. Instead, MacKinnon et al. recommended testing the indirect effect of the exogenous variable on the endogenous variable through the mediating factor, using the procedure developed by Sobel (1982). This procedure is used in the LISREL program in testing the indirect effects of the exogenous variables on the endogenous variables through the mediating variables. However, MacKinnon et al. also noted a problem with the standard errors of the indirect effects that are used in the LISREL program

in evaluating the significance of the indirect effects. Subsequently, Shrout and Bolger (2002) suggested a bootstrap procedure for correcting the standard errors. In general, bootstrap methods offer an empirical method of determining the significance of statistical estimates (Efron & Tibshirani, 1993). Also, Shrout and Bolger recommended that researchers report the 95% CI for the significance of mean indirect effect from the bootstrap results. If the CI does not include zero, then the indirect effect is considered statistically significant at the .05 level. Therefore, after the structural models were examined through the LISREL program, the bootstrap procedure was used to test whether or not the indirect effects were statistically significant.

In the bootstrap procedure (see Shrout & Bolger, 2002), 1,000 samples were first created from the original data set ($N = 299$) by random sampling with replacement. Second, the structural equation model was tested with these bootstrap samples, yielding 1,000 estimates of each path coefficient. Third, the output from these 1,000 estimates of each path coefficient were used to calculate estimates of the indirect effect of attachment anxiety or attachment

¹ Satisfaction of the relatedness need may be the conceptual opposite of perceived loneliness. Therefore, we repeated the analyses with a model of only satisfaction of the autonomy and competence needs in order to remove the potential confound of relatedness and loneliness. This model also provided a good fit to the data. The mediation pattern and the path coefficients for the model with satisfaction of relatedness need are comparable to those for the model without satisfaction of relatedness need.

Table 3
Correlations Among Latent Variables for the Measurement Model

Latent variable	1	2	3	4	5	6
1. Attachment anxiety	—	.20**	-.50***	.60***	.64***	.56***
2. Attachment avoidance		—	-.40***	.33***	.30***	.38***
3. Basic psychological needs satisfaction			—	-.64***	-.80***	-.84***
4. Shame				—	.73***	.64***
5. Depression					—	.81***
6. Loneliness						—

Note. $N = 299$.

** $p < .01$. *** $p < .001$.

avoidance on shame, depression, and loneliness through the mediation of basic psychological needs satisfaction. This was done by multiplying 1,000 pairs of path coefficients (a) from the independent variables (i.e., attachment anxiety or attachment avoidance) to the mediator variable (basic psychological needs satisfaction) and (b) from the mediator variable (i.e., basic psychological needs satisfaction) to the dependent variables (i.e., shame, depression, and loneliness). Finally, based on Shrout and Bolger's suggestion, if the 95% CI for the estimates of the indirect effects based on these 1,000 indirect effect estimates does not include zero, then it can be concluded that the indirect effect is statistically significant at the .05 level. Results shown in Table 4 indicate that the 95% CI for the six indirect effects did not include zero, indicating that all of the indirect effects were statistically significant. In addition, the direct paths from attachment anxiety to shame, depression, and loneliness had weights of .37, .32, and .19 ($Z_s = 4.40, 5.31, \text{ and } 4.15; p_s < .001$), respectively, which were also significant. There-

fore, the relationships of attachment anxiety to shame, depression, and loneliness were partially mediated by basic psychological needs satisfaction, whereas the relationships of attachment avoidance to shame, depression, and loneliness were fully mediated by basic psychological needs satisfaction. It is important to note that 35% of the variance in basic psychological needs satisfaction was explained by attachment anxiety and attachment avoidance; 51% of the variance in shame, 72% of the variance in depression, and 74% of the variance in loneliness was explained by attachment anxiety and basic psychological needs satisfaction (see Figure 2).

Discussion

The significant findings in the present study are that basic psychological needs satisfaction partially mediated the relationships between attachment anxiety and shame, depression, and loneliness and fully mediated the relationships between attachment

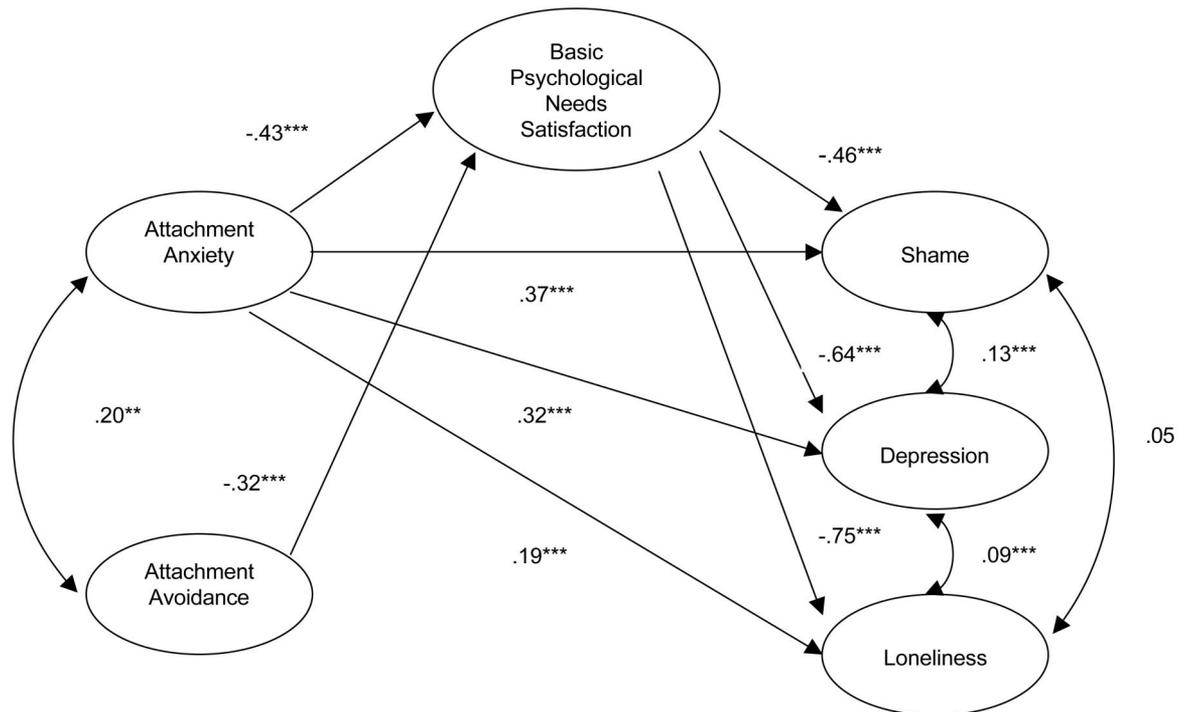


Figure 2. The structural model. $N = 299$. ** $p < .01$. *** $p < .001$.

Table 4
Bootstrap Analyses of the Magnitude and Statistical Significance of Indirect Effects

Independent variable	Mediator variable	Dependent variable	β standardized indirect effect	<i>B</i> mean indirect effect ^a	<i>SE</i> of mean ^a	95% CI mean indirect effect ^a (lower and upper)
Attachment anxiety→	BPNS→	Shame	$(-.43) \times (-.46) = .20$	0.0323	0.00021	0.020, 0.046
Attachment anxiety→	BPNS→	Depression	$(-.43) \times (-.64) = .28$	0.3914	0.00197	0.274, 0.522
Attachment anxiety→	BPNS→	Loneliness	$(-.43) \times (-.75) = .32$	0.1808	0.00087	0.127, 0.238
Attachment avoidance→	BPNS→	Shame	$(-.32) \times (-.46) = .15$	0.0261	0.00021	0.014, 0.041
Attachment avoidance→	BPNS→	Depression	$(-.32) \times (-.64) = .20$	0.3157	0.00214	0.194, 0.462
Attachment avoidance→	BPNS→	Loneliness	$(-.32) \times (-.75) = .24$	0.1457	0.00093	0.089, 0.208

Note. BPNS = Basic Psychological Needs Satisfaction Scale-general version. CI = confidence interval.

^a These values are based on unstandardized path coefficients.

avoidance and shame, depression, and loneliness. Although the attachment literature includes several empirical examinations of maladaptive, negative mediators (e.g., maladaptive perfectionism or self-concealment) used by those with insecure attachment, it offers little guidance to clinicians striving to help such individuals replace these ineffective strategies with more adaptive, positive approaches. Given that counseling psychology's tradition is to focus on people's strengths (Gelso & Fretz, 2001), this lack in the empirical literature is somewhat surprising. Encouraging individuals to abandon maladaptive tendencies (e.g., maladaptive perfectionism or self-concealment) may be an important step in helping them live fuller healthier lives, but it is not in itself sufficient. Individuals possess these maladaptive tendencies for a reason—often they may be attempting to meet unfulfilled needs in their lives (e.g., being perfect in order to be liked by others or to be viewed as a competent person). Attempting to intervene and modify maladaptive strategies without effectively addressing the underlying reasons behind these strategies is likely to be ineffective. By identifying three basic psychological needs (e.g., autonomy, competence, and relatedness) that serve as mediators of the relationship between attachment and levels of shame, depression, and loneliness, we hope to provide clinicians with a more definitive and strength-based therapeutic focus, through which they can help individuals adaptively fulfill their psychological needs. These findings may be especially welcome in time-limited counseling environments because directly targeting individuals' unmet psychological needs is a much less time-intensive task than attempting to alter their fundamental attachment orientation.

The results also suggest that both attachment anxiety and attachment avoidance are negatively associated with basic psychological needs satisfaction. These results are consistent with previous findings that general attachment security and basic needs satisfaction are positively associated (La Guardia et al., 2000). Similarly, basic psychological needs satisfaction was negatively associated with shame, depression, and loneliness. These findings expand on previous research on the relationship between basic psychological needs satisfaction and well-being (Reis et al., 2000; Sheldon et al., 1996), self-esteem, and anxiety (Deci et al., 2001) by providing empirical support for the role of fulfilling fundamental psychological needs in mediating the relationship between attachment and the indices of distress (i.e., shame, depression, and loneliness).

It is interesting to note that the direct relationships between attachment avoidance and shame, depression, and loneliness were

not statistically significant, suggesting that these relationships can be described exclusively in terms of indirect effects through basic psychological needs satisfaction. In contrast to attachment avoidance, the direct relationships between attachment anxiety and shame, depression, and loneliness remained statistically significant even after controlling for the indirect effects mediated through basic psychological needs satisfaction. However, it is important to note that the magnitude of the indirect effects ($\beta = .20, .28,$ and $.32,$ respectively) were moderate in magnitude. This implies that if basic psychological needs were satisfied, then college students with attachment anxiety could still benefit from decreasing their feelings of shame, depression, and loneliness. This also implies that other variables unrelated to basic needs satisfaction may also be important factors for the feelings of shame, depression, and loneliness experienced by college students with high attachment anxiety.

Our results also indicate that basic psychological needs satisfaction is more of a mediator for attachment avoidance than it is for attachment anxiety, which may be a function of internal working models of self and others. Individuals with high levels of attachment anxiety tend to have a negative working model of self and are more likely to suppress or be unaware of their basic psychological needs because they have learned that these needs are part of what makes them unlovable. Conversely, individuals with high levels of attachment avoidance are likely to have a negative model of others and have learned that meeting basic psychological needs is not a bad idea. Also, such individuals tend to believe that others are unavailable to fulfill these needs. Therefore, they are more likely to rely on themselves to meet their basic psychological needs in order to manage their distress.²

Future studies should continue searching for other potential mediators that may contribute to the relationship between attachment anxiety and shame, depression, and loneliness. Several ineffective strategies (e.g., self-concealment or maladaptive perfectionism) were found in previous research to be negative mediators between attachment and distress (e.g., Lopez et al., 2002; Wei et al., 2004). It is possible that (a) insecure attachment is positively associated with the use of these ineffective strategies, (b) these

² We thank one reviewer for suggesting we address why basic psychological needs satisfaction mediates the relationship between attachment avoidance and distress more than it mediates the relationship between attachment anxiety and distress.

ineffective strategies contribute to basic psychological needs dissatisfaction, and (c) this process contributes to distress. Future research should examine this possibility. The results from the present study imply that individuals with insecure attachment can decrease their levels of distress by more effectively satisfying their basic psychological needs. However, the present study does not provide a description of the process by which individuals with insecure attachment can better meet their basic psychological needs. Future research might use the longitudinal designs to examine other variables, which may serve as effective, adaptive mediators (e.g., initiating personal growth or actively building social connections) of the association between insecure attachment and subsequent basic psychological needs satisfaction. Also, future researchers may wish to design, implement, and evaluate the outcomes of short-term therapy groups aimed at helping individuals with attachment anxiety or avoidance better fulfill their psychological needs in order to reduce their distress. Finally, future research might use multiple measures for shame and/or loneliness in developing the latent variables, interview-based attachment measures, or might gather data from multiple sources, such as friends, roommates, or parents.

Even though these results suggest some intriguing possibilities for future research, this study does suffer some limitations. First of all, our results reflect the responses of a college-aged, primarily Caucasian sample in a large Midwestern university. Replication of the present study with diverse samples is necessary before the results can be generalized to ethnic minorities. In particular, Sheldon et al., 2001, found that the mean score of relatedness needs for South Korean college students (a collective culture) was higher than those for U.S. college students (an individualistic culture). Researchers might continue this line of research to examine whether the underlying constructs of the three basic psychological needs are equivalent across different cultures. Then, researchers could examine whether the strengths of the associations between attachment and basic psychological needs satisfaction and between basic psychological needs satisfaction and distress are equivalent across different cultures. Additionally, replication of the present study in other settings (e.g., with clinical samples) would add additional robustness to our findings. It is also important to note that, although a powerful technique, our structural equation model is based on correlational data and is thus unable to establish causal relationships. Another limitation of note was the low alpha ($\alpha = .68$) for the Autonomy subscale. Further studies may wish to make use of more reliable methods of measuring autonomy. Furthermore, the present study is limited to the self-report measure. Future studies may benefit from the inclusion of observational data obtained from objective trained raters in order to remove possible self-report biases among participants.

In addition to exploring positive, adaptive mediators of the relationship between attachment and distress, this study provides some suggestions for clinicians interested in intervening with insecurely attached individuals experiencing shame, depression, and loneliness. The present results suggest that clinicians working with individuals with attachment avoidance may help them reduce their levels of distress by helping them to meet their psychological needs for relatedness, autonomy, and competence. Alternatively, clinicians working with anxiously attached individuals must keep in mind that, in addition to basic psychological needs dissatisfaction, other factors may be contributing to their clients' sense of

shame, depression, and loneliness. Perhaps increasing basic psychological needs satisfaction is only one of several possible interventions, which could reduce the feelings of shame, depression, and loneliness experienced by college students with high levels of attachment anxiety. Moreover, if the present results are confirmed with clinical populations or validated by clinical interventions, it would seem advisable for clinicians to collaboratively explore with their clients ways in which their attempts to fulfill these basic psychological needs have been thwarted. Ideally, clinicians and clients would then brainstorm alternative methods of satisfying these needs, helping the client discontinue using their old, ineffective strategies. Clinicians can also help clients with insecure attachment develop an awareness and understanding of the underlying sources of their distress by exploring how their habitual attachment-related strategies may be preventing them from meeting their needs for relatedness, autonomy, and competence and how these strategies, in turn, relate to their feelings of distress. In conclusion, effective counseling with these populations may require that explicit attention be paid to both reducing the individuals' use of negative, maladaptive strategies (as previous research suggests) as well as directly helping them find more positive, adaptive methods of satisfying unmet psychological needs.

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