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RUNNING HEAD: DEPRESSION AND STRESS AMONG HIV+ ADULTS

Attachment Style, Stigma, and Psychological Distress Among HIV+ Adults

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ABSTRACT

This study explored the role of adult attachment style in reported experiences of HIV-related stigma, stress and depression in a diverse sample of HIV+ adults.

Participants (N = 288) recruited from AIDS service organizations were administered the Experiences in Close Relationships Scale, Perceived Stress Scale, CES-D, HIV Stigma Scale, and a health information questionnaire. Adult romantic attachment style was significantly associated with perceived stress, depression, and HIV-related stigma.

Results of regression analyses supported contentions that in addition to HIV symptomatology, other psychosocial risk factors such as attachment style and stigma contribute to perceived stress and depression among HIV+ men and women.

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Considerable evidence suggests that various aspects of personal relationships and psychological status have significant implications for physical health. Studies of individuals with human immunodeficiency virus-acquired immunodeficiency syndrome (HIV-AIDS) have often focused on stress and depression due to substantial evidence of their deleterious effects on physical health and the immune system, including those aspects affected by HIV (Evans et al., 1989; Herbert & Cohen, 1993). Although rates of perceived stress, depression and other psychiatric symptoms are elevated in HIV-seropositive (HIV+) men and women compared to HIV-negative populations (Thompson, Nanni, & Levine, 1996; see Atkinson & Grant, 1994 and Rabkin, 1996 for reviews), investigators have concluded that HIV status is not by itself a strong predictor of depression or anxiety (Dickey, Dew, Becker, & Kingsley, 1999; Rabkin, 1996). Instead, mental health outcomes appear to be consequences of a complex interface between HIV serostatus and other risk factors, including levels of HIV-related symptomatology, lack of social support, and self-image (Dickey et al., 1999; McClure, Catz, Prejean, Brantley, & Jones, 1996; Vosvick et al., 2004).

Recently, researchers (Hunter & Maunder, 2001; Feeney, 2000) have argued that attachment theory provides a useful model for understanding illness behaviors and/or outcomes, primarily because the theory helps explain individual differences in emotional regulation, stress reactions and interpersonal behavior. Supporting this view is evidence linking adult attachment style to migraine disability (Rossi, Di Lorenzo, & Malpezzi, 2005), diabetes outcomes (Turan, Osar, & Turan, 2003), medical help-seeking (Feeney & Ryan, 1994), various physical symptoms and somatic complaints (Noyes, Stuart, & Langbehn, 2003), and many different forms of psychopathology (see Dozier, Stovall, &

Albus, 1999 for review). Despite its potential relevance, few studies have examined links between adult attachment style and psychological functioning in an HIV+ population.

The current study explored how adult attachment style might relate to the experience of psychological distress and HIV-related stigma, and further how attachment style and self-image related to HIV stigma together might contribute to the prediction of stress and depression levels in a diverse sample of HIV+ men and women.

Attachment Theory

Drawing upon ethological, evolutionary, and biological conceptions, Bowlby (1973, 1980) theorized that humans, like other species, were inherently predisposed to seek out and bond with an attachment figure for protection. When security is threatened, fear and anxiety activate attachment behavior, which is defined as “any form of behavior that results in a person attaining proximity to some other differentiated and preferred individual,” who is perceived as better able to cope with the world (Bowlby, 1980, p. 39). Although most visible in children when tired, ill, or afraid, attachment behavior can be observed throughout the life cycle in stressful circumstances (Bowlby, 1980). In the context of caregiver-child attachments, children develop internal working models of self and other, which are carried forward to influence ongoing development and mental health (Thompson, 1991). Beyond infancy, attachment security derives not only from early caregiver-child relationships, but also from current attachment relationships (Kobak, 1999), which can include continuing bonds with family and newer attachments to romantic partners (Ainsworth, 1991).

Although theoretically rooted in the same innate system, romantic attachment style differs from parent-child bonds in several important ways, including reciprocity of

attachment and caregiving, as well as sexual mating (Hazan & Zeifman, 1999).

According to Bartholomew and her colleagues (1990; Bartholomew & Horowitz, 1991), secure adult attachment style is characterized by positive internal working models of self and others, which translates into low attachment anxiety and low attachment avoidance. Three insecure adult attachment styles, on the other hand, are characterized by negative internal working models of self and/or other. Preoccupied individuals experience high levels of attachment anxiety because they believe they are unworthy of love and fear abandonment by others. In contrast, dismissing-avoidant adults view themselves as competent and capable and thus experience low levels of anxiety, while they view others as rejecting or unavailable and consequently seek to avoid emotional intimacy. Fearful-avoidant attachment style is characterized by negative internal models of both self and other with high levels of both attachment anxiety and avoidance, and is associated with the poorest adjustment of the four adult prototypes (e.g., Brennan & Shaver, 1998; Carnelley, Pietromonaco, & Jaffe, 1994; Riggs et al., in press). Although these internal working models self and other tend to persist through the life course and become increasingly resistant to change, they can be modified by different environmental experiences (see Belsky, 1999 for review).

Systematic attachment style differences have been found in affective responses to stress (Mikulincer & Florian, 1998). Secure individuals are more likely to demonstrate effective coping strategies, such as a healthy degree of self-disclosure and help-seeking (Lopez, Melendez, Sauer, Berger, & Wyssman, 1998; Mikulincer & Nachshon, 1991; Riggs, Jacobvitz & Hazen, 2002), and consequently are less likely to show symptoms of emotional disturbance (e.g., Mickelson, Kessler, & Shaver, 1997; Riggs & Jacobvitz,

2002). Insecure individuals with high levels of attachment anxiety employ hyperactivating coping strategies that tend to perpetuate distress by exaggerating emotional and care-seeking responses (Ciechanowski, Sullivan, Jensen, Romano & Summers, 2003). Conversely, insecure individuals with high levels of attachment avoidance employ deactivating coping strategies that increase vulnerability by suppressing negative affect and inhibiting support-seeking (Mikulincer & Florian, 1995).

When faced with significant life stressors, insecure individuals are likely to demonstrate maladaptive behaviors, an escalation of defenses, and vulnerability to emotional disorder. In non-clinical populations, preoccupied and fearful attachment styles are associated with depression (e.g., Carnelley et al., 1994), and preoccupied attachment also appears to be most closely associated with anxiety symptoms (Cole-Detke & Kobak, 1996; Rholes & Simpson, 2004). Among persons living with chronic and/or life-threatening illness, research findings suggest that attachment security also may play an important role in treatment response and positive emotional adjustment to altered health status (Belg, 1996; Chessler, 2000; Ciechanowski et al., 2003; Schmidt, Nachtigall, Wuethrich-Martone & Strauss, 2002; Turner-Cobb et al., 2002).

HIV and Mental Health

A diagnosis of a life-threatening disease is a major source of stress that is likely to activate the attachment system and can affect both physical and emotional well-being. In addition to the stress of chronic illness, HIV+ adults may also struggle to cope with other significant stressors. For example, a diagnosis of HIV may bring financial strain and unwelcome changes in lifestyle and close relationships (Antoni et al., 1991; Maj, 1990; Wadland & Gleason, 1991). In contrast, being in a supportive intimate relationship may

protect HIV+ adults against depression (Ashton et al., 2005; Komiti et al., 2003).

HIV/AIDS is also uniquely related to the likelihood of knowing close friends or partners, who are ill or dead due to HIV/AIDS (Sikkema, Kochman, DiFranceisco, Kelly, & Hoffman, 2003; Thompson et al., 1996), as well as a high degree of social stigma that does not accompany other chronic physical illnesses (Roeloffs et al., 2003). Perhaps as a result of significant social stress that accompanies a seropositive status, many HIV+ adults turn to maladaptive coping strategies, such as disengagement, denial, avoidance, or substance use (Gore-Felton et al., in press; Komiti et al., 2003; Penedo et al., 2001), which are associated with decreases in both psychological and functional quality of life (Vosvick et al., 2003; Vosvick et al., 2002). In two national surveys, Herek and Capitanio (1993, 1998) reported that a high percentage of Americans reported that they would be uncomfortable in situations where contact with an HIV+ person was possible (e.g., having an HIV+ coworker, living in an HIV+ neighborhood). Stigma associated with HIV has deleterious effects for seropositive individuals, even to the point of deterring them from seeking medical care (Chesney & Smith, 1999; Reece, 2003). Due to fears of discrimination and physical violence, persons living with HIV also may decide not to disclose their serostatus to family members, friends or sexual partners. In turn, the choice not to disclose one's serostatus has been linked to feelings of isolation and increased psychological distress in HIV+ people (Crandall & Coleman, 1992).

Stigmatized individuals are also vulnerable to feelings of self-hatred, which can result from the internalization of society's negative views (Herek, 1990). Internalized stigma may make an individual more sensitive to both actual and anticipated rejection and stigmatization by others (Chesney & Smith, 1999), which is likely to affect both their

mental health and their interpersonal relationships. In support of this idea, Lee, Kochman, and Sikkema (2002) indicated that internalized stigma related to HIV status, measured by two items assessing actual or anticipated rejection and stigmatization by others, contributed to significantly higher levels of depression and anxiety.

Given the host of stressors associated with HIV+ status, it is not surprising that HIV+ individuals are likely to experience higher levels of stress and depression than healthy controls (see Atkinson & Grant, 1994 for review). Greater stress in HIV+ populations has been linked to poor coping strategies, sleep disturbance, depression, greater risk for worsening HIV disease stage and a faster progression to AIDS (Evans et al., 1995; Koopman et al., 2000; Leserman et al. 2002; Vosvick et al., 2004). Although studies have reported that HIV-seropositive individuals are more likely to experience depression than those who are seronegative (Leserman, 2003), conflicting evidence does not support a direct association between HIV+ status and depression (Rabkin, 1996). The relationship between HIV and depression is difficult to assess, due to the complex set of factors that likely interact with HIV to create emotional distress. For example, depression among HIV+ individuals has been linked to internalized stigma (Lee et al., 2002), dysfunctional attitudes and maladaptive coping strategies (Gore-Felton et al., in press; Penedo et al., 2001), medications frequently used to treat HIV (Kalichman, Rompa, & Cage, 2000), HIV-related symptomatology, major life stress and a lack of social support (McClure et al., 1996). Dickey et al. (1999) reported that HIV + status was significantly related to depression, but found that other psychosocial factors (e.g., age, employment, support, coping strategy) fully mediated the association. Based on these findings, researchers have concluded that HIV status is not by itself a strong predictor of

mood or anxiety disorders, but instead interacts with other psychosocial characteristics of the individual (Dickey et al., 1999; Rabkin, 1996).

The Current Study

Due to evidence suggesting that mental health status may affect the progression of disease (Evans et al., 1989; Herbert & Cohen, 1993), it is important to investigate psychosocial risk factors that may contribute to the experience of stress and depression among HIV+ adults. Based on theoretical formulations suggesting that individual differences in health behaviors and outcomes may be related to the attachment system (Hunter & Maunder, 2001; Feeney, 2000), the current study investigated the association of adult romantic attachment style to psychological symptoms of distress (i.e., perceived stress, depression) and HIV-related stigma in a sample of HIV+ adults, and further explored how attachment style and HIV stigma together might predict stress and depression levels beyond what can be accounted for by demographic and HIV-related medical variables (medication, HIV-related symptoms). In contrast to previous research using a simple two-item measure of stigma (Lee et al., 2002), the current study used a more complex 40-item instrument published by Berger et al (2001), which delineates four different types of stigma-related concerns, providing a broader view of this construct.

We predicted that insecure attachment style would show significant associations with psychological distress, with preoccupied and fearful attachment styles associated with the highest levels of stress and depression. HIV-related stigma has not been previously examined in relation to romantic attachment, so we based our hypotheses on theoretical conceptualizations of the different attachment styles. Because they possess high levels of anxiety and negative internal working models of self, we expected that

preoccupied and fearful adults would be more likely to endorse higher levels of personalized stigma and negative stigma-related self-image than secure or dismissing adults. On the other hand, due to high levels of avoidance and negative internal working models of others, we predicted that dismissing adults would endorse less concern regarding public attitudes toward HIV and lower levels of disclosure of their seropositive status. Finally, we expected adult attachment anxiety and HIV-related stigma to significantly predict levels of depression and stress above the contribution of demographic and HIV-related health factors.

Method

Participants

Participants (N = 288) were recruited from AIDS Service Organizations (ASO's) in the Dallas-Fort Worth Metroplex as part of a large study on HIV-related stigma conducted by the Center for Psychosocial Health at the University of North Texas during the academic calendar year 2002-2003. To be included in the study participants had to be HIV seropositive, at least 18 years of age, and sufficiently fluent in written English to participate in a written survey. Women made up almost half (48%) of the sample and age ranged from 19 to 68 (M = 41.5, SD = 8.39). Ethnically, the sample consisted of 54.5% African Americans, 29.5% Caucasians, and 10.6% Latinos. A majority (69%) of participants were below the poverty line with annual incomes less than \$10,000. HIV medications were reportedly used by 74.6% of the sample. A slight majority of the sample (58.4%, $n = 141$) was heterosexual, while 29.7% ($n = 77$) were gay and 15.8% ($n = 41$) were bisexual. As is typical in diverse HIV+ samples, the

majority of males in the sample were either gay (53.6%, $n = 74$) or bisexual (20.3%, $n = 28$), whereas only 2.5% ($n = 3$) and 10.7% ($n = 13$), respectively, of the women were gay or bisexual.

Procedures and Instruments

Appropriate institutional review board approval was obtained and signed informed consent forms were collected from all participants. ASO employees and study staff recruited participants through multiple venues including posters, word of mouth and referrals. Our sample was a stratified convenience sample which ensured a gender balanced sample and an ethnic distribution reflecting the HIV+ population in the Dallas – Fort Worth Metroplex. Participants provided anonymous self-report data and participants were reimbursed \$15.

Demographic and Health information. Participants completed a demographic questionnaire (e.g., age, sex, ethnicity, sexual orientation, income, education, etc.) and health-related information survey. As part of the overall health assessment, participants reported on their current medical condition (e.g., date of HIV diagnosis, T-cell count, viral load, etc.), recent HIV symptoms and related diseases/infections. The symptom list was derived from the Multicenter AIDS Cohort Study (MACS, StatEpi Coordinating Center Department of Epidemiology, n.d.) and assessed presence and severity of 28 HIV-related symptoms. In the current study, only data that reflected the presence or absence of a symptom was used and then summed to determine the total number of symptoms experienced.

Experiences in Close Relationships Inventory (ECR; Brennan, Clark, & Shaver, 1998). The ECR is a self-report measure of adult romantic attachment style, consisting of

36 items chosen from existing self-report measures based on the results of a principal components analysis, which produced two major factors. Each item is rated on a 7-point Likert scale ranging from “not at all like me” to “very much like me.” Brennan et al. reported that the two 18-item higher-order scales, attachment anxiety and attachment avoidance, are almost uncorrelated with one another ($r = .11$) and demonstrated coefficient alphas above .90, as well as item-total correlations ranging from .50 to .73. Based on cluster analysis, Brennan et al. developed a categorization procedure using standardized coefficients that identifies four distinct attachment groups: secure, preoccupied, dismissing-avoidant, fearful-avoidant. The two attachment scales demonstrate internal consistency and test-retest reliability, and have high construct, predictive, and discriminant validity. Cronbach’s alphas for both attachment anxiety and attachment avoidance scales in this study were .99.

The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) Ten items on a 5-point Likert-type scale with anchors of 0 = never to 4 = very often were used from the PSS, a measure of the degree to which situations in one's life are appraised as stressful. Stem questions included items such as, “In the last month how often have you found that you could not cope with all the things you had to do?” Cohen et al. demonstrated concurrent and predictive validity, as well as adequate internal and test-retest reliability using a large sample of undergraduates and a smaller sample of adults participating in a smoking cessation program (Mean age = 38.4). Discriminant validity was also established when compared to a depressive symptomatology scale. In addition, Cohen et al. reported that the PSS was a better predictor of outcomes (e.g., social anxiety, depressive and physical symptoms,) than were life-event scales that assess events over a

one-month period (i.e., the Hassle Scale, Kanner et al, 1981; the Unpleasant Events Scale, Lewinshohn & Talkington, 1979). Prior to the PSS, specific life events associated with stress were used as predictors of outcomes rather than an individual's appraisal of the event. Cohen et al found that these subjective experiences were better predictors of both psychological and physiological outcomes than the specific events themselves. Cronbach's alpha for the PSS in this sample was .85.

The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a 20-item self-report scale designed as a research tool to measure current levels of depressive symptomatology. A cut-off score of 16 indicates probable depression and 23 indicated significant depression (Radloff & Locke, 1986). The CES-D demonstrated high internal consistency in both the general (about .85) and patient (about .90) populations. By taking into account life events, Radloff demonstrated adequate test-retest reliability ($r = .54$) for subjects reporting no negative environmental stressors, although the reliability was lower for subjects reporting negative life events. Prior research indicates that the CES-D has excellent discriminant and concurrent validity using both clinical and self-report criteria. Cronbach's alpha for the CES-D in this sample was .91.

The HIV Stigma Scale (Berger, Ferrans, & Lashley, 2001). Based on the literature on stigma and psychosocial aspects of having HIV, the HIV Stigma Scale is a 40-item instrument measuring the stigma perceived by people with HIV. Factor analysis with a large, diverse sample of people with HIV produced four subscales: Personalized Stigma (i.e., experiences or fears of rejection), Disclosure Concern, Negative Self-image, and Public Attitudes (i.e., concerns regarding discrimination and negative societal attitudes

towards HIV). Berger et al. reported test-retest reliability over 2-3 weeks and construct validity in relation to constructs, such as self-esteem, depression, social support, and social conflict. In addition, internal consistency was supported with coefficient alphas between .90 and .93 for the subscales and .96 for the entire 40-item instrument (Berger et al.). Cronbach's alphas for the four subscales in this sample ranged from .83 for the Disclosure scale to .95 for the Personalized Stigma scale.

Data Management and Analysis

All data analyses were performed using SPSS version 12.0 (SPSS, Inc., Chicago IL). To control for human error, two different individuals entered data into SPSS on two separate occasions and inconsistencies were corrected based on source material.

Preliminary analyses were performed to provide descriptive data and identify significant group differences within in the sample. Subsequently, MANCOVA's were conducted to examine the relationships between attachment style and our variables of interest (depression, stress and HIV-related stigma). Finally, two exploratory hierarchical regression analyses were conducted to test our theoretical models predicting depression and stress. Results of each set of analyses are presented separately below.

Results

Preliminary analyses

Descriptive statistics and correlations among the scales used in the study are presented in Table 1. The CES-D mean ($M = 23.75$, $SD = 12.58$) exceeded cut off scores, indicating clinically significant levels of depression among participants. Conversely, perceived stress in this study's sample ($M=19.48$, $SD = 6.33$) was lower than

the college students' scores ($M=23.18$, $SD=7.31$) used to validate this scale. ECR adult attachment styles in this HIV+ sample were predominantly insecure, with self-reported Fearful classification disproportionately represented. In sharp contrast to previously reported distributions ranging between 30-46% Secure, 14-20% Dismissing, 16-24% Preoccupied and 23-24% Fearful among healthy non-clinical adults (Bartholomew & Horowitz, 1991; Brennan et al., 1998), the distribution of adult attachment classifications in this sample was 10% Secure ($n = 28$), 13.1% Dismissing ($n = 35$), 16.1% Preoccupied ($n = 50$), and 57.8% Fearful ($n = 155$).

Most analyses comparing the variables of interest in relation to demographic variables (i.e., sex, race, age, education, income, sexual orientation) were non-significant. However, males tended to report lower levels of perceived stress than females, $F(1, 264) = 6.90$, $p = .009$. In addition, income was significantly related to two HIV Stigma subscales: Disclosure, $F(1, 255) = 6.38$, $p = .012$, and Negative Self-image, $F(1, 255) = 4.30$, $p = .039$, with participants earning less than \$10,000 reporting greater concern regarding disclosure and more negative self-image compared to participants earning higher incomes. As a result, gender was used as a covariate in analyses involving perceived stress, and income was used as a covariate in analyses involving HIV stigma.

Although not related to the ECR Anxiety and Avoidance subscales, sexual orientation was significantly associated with ECR attachment classification, $\chi^2(3, 259) = 13.07$, $p < .04$. Heterosexual participants were significantly more likely to be Secure or Fearful and less likely to be preoccupied or dismissing. In contrast, gay participants were more likely to be Preoccupied and less likely to be Secure, whereas bisexual participants were more likely to be Dismissing and less likely to be Secure or Fearful.

Adult Attachment Style

Two MANCOVAs were conducted comparing the four ECR attachment classifications first to symptoms of psychological distress (i.e., depression, stress) using gender as a covariate, and then to the four dimensions of HIV Stigma using income as a covariate. Results of the first MANCOVA indicated that attachment category was significantly related to overall psychological distress, Wilks' Lambda $F(3, 259) = 5.64, p < .000, \eta^2 = .06$ (See Table 2). Follow-up univariate analyses showed that attachment style was significantly associated with depression, $F(3, 259) = 8.29, p < .000, \eta^2 = .09$, and stress, $F(3, 259) = 15.66, p < .000, \eta^2 = .15$. Planned contrasts indicated that Secure adults reported significantly less stress and depression than the three groups of insecure adults. In addition, Preoccupied participants scored significantly higher on perceived stress than either Fearful or Dismissing participants.

Results of the second MANCOVA indicated that attachment category was significantly related to overall HIV Stigma, Wilks' Lambda $F(3, 250) = 2.52, p = .003, \eta^2 = .039$. Follow-up univariate analyses showed that attachment style was significantly associated with all four HIV Stigma subscales (See Table 2). As predicted, planned contrasts showed that Secure adults reported significantly less concerns regarding HIV Personalized Stigma, Negative Self-image, and View of Public Attitudes than Preoccupied and Fearful adults. In addition, Preoccupied participants, but not fearful, scored significantly higher than Secure participants on the Concerns about Disclosure

scale, and scored significantly higher than Dismissing participants on all four HIV-related stigma scales.

Predictors of Stress and Depressive Symptoms

Perceived stress and depression were significantly correlated with predictor variables in the expected direction. To test hypotheses regarding the predictive power of attachment style and HIV-related stigma, two hierarchical multiple regression analyses were conducted with stress and depression as outcomes. Missing data across instruments lowered the total N available for the regression analyses to 237 participants. Those with missing data were more likely to be female, $\chi^2(1, 287) = 7.70, p < .006$, but otherwise did not differ from participants included in the regressions. Data were entered into the regression models in four blocks. The first two blocks controlled for demographic and health-related predictors and the third block consisted of the ECR attachment anxiety and attachment avoidance scales, all of which were simultaneously entered. Because a new instrument was used to assess HIV stigma, the fourth block was exploratory and the HIV-related stigma scales were entered stepwise to determine which stigma variables significantly contributed to the variance in our model.

The full regression model for perceived stress accounted for approximately 30% of the variance [Adjusted $R^2 = .305$, $F(11, 225) = 10.41, p < .000$] (See Table 3). The first block of demographic variables separately explained 5% of the variance [Adjusted $R^2 = .055$, $F(6, 230) = 3.31, p < .004$], and the second block of health-related variables added another 8.8% to the variance accounted for, indicating that the first two blocks together explained 14.3% of the variance in outcome [Adjusted $R^2 = .143$, $F(8, 228) = 5.92, p < .000$]. Specifically, female gender, bisexual orientation, and greater symptom

load were significant predictors of perceived stress levels. In the third block, attachment anxiety significantly predicted stress, separately explaining an additional 9.8% of the variance, bringing the cumulative percentage explained by the three blocks to 24.1% [Adjusted $R^2 = .241$, $F(9, 227) = 9.31$, $p < .000$]. In the final step of the model, higher levels of HIV-related Negative Self-image predicted greater perceived stress, separately accounting for 6% of the 30% total variance explained by the full model. Thus, female gender, bisexuality, greater symptom load, higher levels of attachment anxiety, and a more negative self-image in relation to HIV stigma provided the best model of prediction for perceived stress.

A different pattern emerged for depression (See Table 3). First, none of the demographic variables were significant predictors of depression [Adjusted $R^2 = .016$, $F(6, 230) = 1.65$, $p = .14$]. The second block of health-related variables was by far the best predictor, explaining a full 27% of the variability in depression levels [Adjusted $R^2 = .274$, $F(8, 228) = 12.15$, $p < .000$], with HIV-related medication initially a significant negative predictor ($\beta = -2.37$, $p < .02$) and symptom load a significant positive predictor ($\beta = 8.93$, $p < .000$) of depression. Attachment anxiety in the third block was a significant positive predictor of depression, accounting for an additional 6.4% of the variance, bringing the cumulative variance accounted for by the first three blocks to 33.8% [Adjusted $R^2 = .338$, $F(9, 227) = 14.36$, $p < .000$]. When the four HIV-stigma subscales were added in the final block, HIV-related medication dropped to non-significance. Adding another 2.8% to the variance accounted for by the first three blocks, HIV Negative Self-image emerged as a significant positive predictor of depression levels [Adjusted $R^2 = .382$, $F(11, 225) = 14.25$, $p < .000$]. Conversely, HIV Personalized

Stigma was a significant negative predictor, separately explaining another 2.6% of the variance [Adjusted $R^2 = .408$, $F(12, 224) = 14.58$, $p < .000$]. The final regression model with all four blocks accounted for 40.8% of the variance in depression, with greater symptom load, higher attachment anxiety, lower HIV Personalized Stigma and higher Negative Self-image remaining as significant predictors of depression. Since HIV-related symptom load's standardized Beta coefficient was considerably weighted in our model predicting depression ($\beta = .51$) we decided to rerun the regression model without symptom load as a variable and found that the model still accounted for 24% of the total variance in depression [Adjusted $R^2 = .24$, $F(11, 225) = 7.20$, $p < .000$].

Discussion

Current results extend the literature on adult attachment and psychological well-being to an HIV+ population and further support contentions that in addition to HIV symptomatology, other psychosocial risk factors contribute to perceived stress and depression among HIV+ adults. The following discussion will first address findings related to the prevalence of insecure attachment style in the sample as a whole and specifically among homosexual or bisexual adults. Subsequently, findings demonstrating associations between attachment style, HIV-related stigma, depression, and stress will be discussed.

Insecure Attachment Style

The distribution of attachment style in this HIV+ sample was highly skewed, with 90% of participants reporting an insecure romantic attachment style. This finding is in contrast to previously reported distributions of insecure attachment in healthy non-

clinical samples of heterosexual (52-55%) and homosexual (62%) college students (Brennan & Shaver, 1998; Ridge & Feeney, 1998), as well as a sample characterized by chronic disease (64%; Schmidt et al., 2002). The prevalence of fearful attachment style and low rate of secure attachment more closely resemble proportions reported for community and clinical trauma populations (Alexander, 1993; Riggs et al., in press). Although attachment organization is assumed to be fairly stable across the lifespan, stressful life events are associated with subsequent alterations of attachment classification (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000; Weinfield, Sroufe & Egeland, 2000). A recent review of posttraumatic stress disorder (PTSD) as a result of medical illness (e.g., stroke, miscarriage/abortion, cardiac surgery, HIV) reported that the highest rates of psychological symptoms were found among patients treated in intensive care units and those with HIV infection (Tedstone & Tarrier, 2003). Taken together, this evidence suggests the possibility that in adulthood a diagnosis of a life-threatening illness, such as HIV, may produce a trauma reaction strong enough to impact adult attachment style.

However, the sample of patients diagnosed with a chronic disease (i.e., breast cancer, leg ulcers, alopecia) did not show a similar pattern of insecure attachment (Schmidt et al., 2002). There are several possible explanations for this discrepancy between the former sample and the current HIV+ sample. First, it is possible that a cumulative effect of prior traumas among HIV+ adults may have affected attachment style before the diagnosis of HIV. Several studies have reported that a history of traumatic life events (e.g., childhood abuse) is prevalent among HIV+ individuals and may contribute to PTSD symptoms (Brief et al., 2004; Leserman, et al., 2005; Martinez et

al., 2002). Additionally, many HIV+ persons have either lost or been threatened by the loss of loved ones to AIDS, and may be struggling with traumatic bereavement or anticipatory grief on top of the threat to their own health (Sikkema et al., 2003). Finally, a diagnosis of HIV/AIDS carries with it a powerful social stigma that is not associated with many other chronic illnesses (Roeloffs et al., 2003), and thus may be experienced as more traumatic and more likely to be associated with a loss of social support than other diseases.

Another explanation for the prevalence of insecure attachment in this sample may be the role of the attachment system in support seeking and sexual behavior. According to Bowlby (1969, 1973, 1980), threats to well-being mobilize efforts to seek the protection and comfort of an attachment figure, which in adulthood is often a romantic partner. Adult romantic attachment is conceptually and empirically associated with adult sexuality (Brennan et al., 1998; Brennan, Wu, & Love, 1998; Hazan & Zeifman, 1999; Schachner & Shaver, 2004; Stephan & Bachman, 1999), which is a primary means of transmission of the HIV virus. Contracting the virus through physical intimacy with a romantic partner may set up an irresolvable approach-avoidance paradox of desiring comfort from an attachment partner, but fearing the partner who may be the original source of the illness and/or carry the threat of rejection or loss. According to Simpson and Rholes (2002), this type of paradox leads to disorganized behavior and may be associated with the fearful-avoidant adult attachment style, which characterized over half of the current sample. If the involvement of the romantic sexual system is the primary factor contributing to the skewed distribution in this sample, measures assessing early attachment experiences with parents may produce quite different results. Further

investigation is warranted regarding the interaction of the sexual and romantic attachment systems among HIV+ individuals.

Contrary to the sparse research on sexual orientation and adult attachment, which has indicated few differences between heterosexuals and homosexuals (Elizur & Mintzer, 2001; Ridge & Feeney, 1998), heterosexual adults in this HIV+ sample were more likely to be secure, whereas homosexual and bisexual adults were more likely to be preoccupied or dismissing, respectively. Lesbian, gay, and bisexual people (LGB) clearly must contend with societal forces that their heterosexual counterparts do not. LGB people generally receive less validation from society and less support from their families than do heterosexuals (Cabaj, 1988; Kurdek & Schmitt, 1987). The process of “coming out” may be quite challenging or even threatening and therefore likely to activate the attachment system. It is possible that this process may contribute to substantial changes in attachment organization (Holtzen, Kenny, & Mahalik, 1995; Mohr, 1999), which then continues to develop and shift in the context of same-sex adult partnerships (Elizur & Mintzer, 2003). A diagnosis of HIV may be reminiscent of the coming out process, particularly with respect to concerns regarding stigma and disclosure, and thus may provoke similar fears about rejection by loved ones and society as a whole that contribute to greater attachment insecurity.

Stigma, Stress and Depression

This is the first study to investigate the association between adult attachment and stigma. Relative to secure individuals, fearful and preoccupied adults endorsed higher levels of personalized stigma and concerns about public attitudes toward HIV, as well as a more negative stigma-related self-image. As expected based on their opposing

characteristics, preoccupied adults significantly differed from dismissing adults on all four HIV-related stigma scales. Dismissing adults reported the lowest levels of HIV disclosure concerns, which like secure adults, were significantly different from levels of disclosure concerns reported by preoccupied adults. Contrary to predictions, however, fearful attachment did not differ from other attachment styles in terms of HIV disclosure concerns and dismissing adults generally showed levels of HIV-related stigma similar to secure adults. While secure and dismissing groups may differ in their views of others and related reasons for less disclosure concern (e.g., confidence in receiving support vs disregarding the opinions of others, respectively), this pattern of associations suggests that perceptions of stigma are more closely related to negative internal models of self along the dimension of attachment anxiety. Alternatively, previous research linking dismissing/avoidant attachment to less self-disclosure (Mikulincer & Nachshon, 1991; Mohr & Fassinger, 2003) suggests the possibility that dismissing participants simply may not intend to disclose their illness and consequently do not report being concerned by the stigma that arises from disclosure. Because this was an initial exploratory analysis, these findings should be considered preliminary and thus warrant further investigation and replication for confirmation.

With respect to psychological distress, this study extends previous research linking anxious attachment style with depression (e.g., Carnelley et al., 1994; Mickelson et al., 1997) to an HIV+ population. Current results also replicate Koopman et al.'s (2000) findings demonstrating an association between perceived stress and more anxious/less secure attachment style among HIV+ persons, using a more statistically sound instrument to assess adult attachment. Consistent with theoretical expectations,

anxious/preoccupied adults perceived significantly greater stress than dismissing and fearful adults, who in turn perceived greater stress than secure adults.

Finally, consistent with the current literature (Nolen-Hoeksema, 2001), results of regression analyses indicated that female gender was associated with higher stress levels. Also like previous research (Hays, Turner, & Coates, 1992; Kelly et al. 1993; McClure et al., 1996), a significant amount of variance in psychological distress was accounted for by HIV symptom load, which proved to be the best single predictor of depression. In addition, new evidence emerged indicating that anxious attachment style and HIV-related stigma contributed to the prediction of stress and depression beyond demographic and health-related variables. Importantly, the use a more complex instrument allowed the identification of two types of stigma-related concerns, specifically HIV-related negative self-concept and experiences or fears of rejection (i.e., personalized stigma), as unique predictors of stress and/or depression. However, the finding that bisexual orientation significantly contributed to stress levels is somewhat puzzling. Based on Toiden's (1993) suggestion that bisexuality represents an interim stage of homosexual identity development, it is conceivable that bisexual adults may experience greater stress levels than other adults due to the cognitive dissonance between a past heterosexual identity and the emerging, but still unresolved, homosexual identity. Another possible explanation for this finding is that bisexual adults may not have publicly "come out" and consequently the diagnosis of HIV may increase the stress of maintaining an external heterosexual identity, leaving bisexual adults with less access to social support systems in the heterosexual or gay communities.

Limitations and Conclusions

The current study should be considered in light of several strengths and limitations. The sample used in the present analysis was a large, gender-balanced diverse group representing a broad spectrum of ethnic backgrounds, sexual orientation and age. While the sample is reflective of the ethnic breakdown of HIV incidence in the larger population of people receiving services from AIDS Service Organizations around the US and includes participants from both urban and rural settings, findings from this sample do not represent HIV+ adults who earn sufficient income for private pay care. Additionally, data were derived exclusively from self-reports, which can contribute to common method variance and are subject to bias related to social desirability responses or the defensive styles of participants. Although the direction of effects is supported by theory, because the data were gathered at one time point, it is impossible to determine whether psychological distress develops before or after, or occurs in tandem with attachment style and HIV-stigma concerns. Similarly, it is unclear whether adult romantic attachment style changes in response to a diagnosis of HIV or whether attachment insecurity preceded the diagnosis and characterizes a group of individuals who are more at risk for contracting HIV/AIDS. Longitudinal research is needed to answer these important questions.

In conclusion, current evidence supports suggestions that attachment constructs can be usefully applied in models of psychological and physical health. This sample's prevalence of fearful attachment style, which is associated with disorganized behavior and psychological distress, suggests that many HIV+ adults may benefit from therapeutic intervention focusing on interpersonal attachment. Moreover, current results imply that the diagnosis of HIV entails not only the trauma of a life-threatening illness stigmatized

by our society, but also imposes serious limitations on the ability to seek and form supportive attachment relationships with romantic partners. This is a particularly disturbing finding when considering LGB adults, who often depend far more on partners and LGB friends than family for social support (Elizur & Mintzer, 2001, 2003; Kurdek & Schmitt, 1987). In addition to examining internalized stigma among HIV+ clients, counselors may find it useful to explore the potential impact of romantic attachment style on physical and mental health. Psychosocial interventions addressing interpersonal functioning in the context of romantic attachments may be particularly helpful to HIV+ persons. For example, individual or couples therapy focusing on attachment-related sexual and emotional concerns may provide an opportunity to foster the development of secure attachment, which can increase psychological well-being and in turn possibly influence disease progression and outcome.

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Table 1

Correlations, Means, and Standard Deviations

	1	2	3	4	5	6	7	8	9
1. Attachment Anxiety	1								
2. Attachment Avoidance	.20***	1							
3. Illicit Drug Use	.03	-.06	1						
4. Personalized Stigma	.30***	.16*	.06	1					
5. Disclosure	.24***	.07	.04	.70***	1				
6. Negative Self-image	.30***	.13**	.05	.82***	.78***	1			
7. View of Public Attitudes	.32***	.14*	.07	.94***	.79***	.86***	1		
8. Perceived Stress	.37***	.11	.19**	.31***	.28***	.35***	.34***	1	
9. Depression	.31***	.24***	.22***	.23***	.19**	.35***	.25***	.56***	1
Mean	4.02	3.70	10.54	42.95	26.50	29.61	49.90	19.48	23.75
SD	1.36	.88	28.075	13.22	6.55	8.72	13.79	6.33	12.58

Table 2

Multivariate and Univariate F-tests for Attachment Style X Psychological Distress and HIV-related Stigma

	Attachment Style				<i>F</i>
	Secure <i>M (SD)</i>	Fearful <i>M (SD)</i>	Preoccupied <i>M (SD)</i>	Dismissing <i>M (SD)</i>	
<i>MANCOVA (N = 265)</i>	PSYCHOLOGICAL DISTRESS				8.44***
Perceived Stress	13.96 (6.45) _a	19.71 (5.62) _b	22.98 (6.84) _c	17.71 (4.94) _b	15.72***
Depression	13.59(12.61) _a	24.83(11.35) _b	27.12 (13.91) _b	22.03(12.02) _b	8.27***
<i>MANCOVA (N = 255)</i>	HIV STIGMA				2.52**
Personalized Stigma	34.08(9.90) _a	44.48(12.02) _{bc}	46.42 (15.96) _b	37.48(12.26) _{ac}	8.03***
Disclosure	24.48 (6.87) _a	26.82 (5.89)	28.15 (7.51) _b	23.79 (7.01) _a	4.18**
Negative Self-image	24.36 (7.94) _a	30.21(8.19) _{bc}	32.02 (10.12) _b	26.76(7.61) _{ac}	6.06***
View of Public Attitudes	41.60(10.05) _a	51.30(12.122) _{bc}	53.81 (17.20) _b	43.67(13.73) _{ac}	7.67***

p* < .05, *p* < .001, ****p* < .0001.

Note. Means with different subscripts differ at the .001 level or more.

Table 3

Results of Hierarchical Regression Analysis of Attachment Style and HIV-related Stigma on Perceived Stress and Depression

Predictors	Perceived Stress (N= 240)		Depression (N= 241)	
	Standardized Beta	<i>t</i>	Standardized Beta	<i>t</i>
Gender	.22	3.06**	-.06	-.88
African American	-.10	-1.67	.05	.94
Hispanic	-.05	-.90	-.01	-.13
Homosexual	.08	.96	-.005	-.07
Bisexual	.16	2.53*	.04	.71
Income	.07	1.31	-.06	-1.18
HIV Medication	-.03	-.46	-.08	-1.58
HIV Symptoms	.22	3.78***	.45	8.45***
ECR Attachment Anxiety	.25	4.26***	.22	4.04***
HIVSS Negative Self-image	.24	4.06***	.41	4.49***
HIVSS Personalized Stigma			-.27	-3.02**

* $p < .05$, ** $p < .01$, *** $p < .001$.