



## Adult attachment security and college student substance use

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### Abstract

Previous research has demonstrated strong links between quality of adult attachment styles and various forms of psychological distress. A burgeoning literature further points to a relationship between insecure attachment and drug use, particularly alcohol consumption. In the present study, we expanded upon the existing literature by examining the relationship between adult attachment style and use of cigarettes, alcohol, and marijuana in a sample of 212 college students. Moreover, based on our previous work [Hankin, B.L., Kassel, J.D., and Abela, J.R.Z. (2005). Adult attachment dimensions and specificity of emotional distress symptoms: prospective investigations of cognitive risk and interpersonal stress generation as mediating mechanisms. *Personality and Social Psychology Bulletin*, 31, 136-151.], we proposed a conceptual model positing that adult attachment style influences both frequency of drug use and stress-motivated drug use through its impact on dysfunctional attitudes and self-esteem. Initial correlational analyses indicated significant (positive) associations between anxious attachment (tapping neediness and fear of abandonment) and both drug use frequency and stress-motivated drug use. Simultaneous regression analyses revealed that, for drug use frequency, the influence of anxious attachment operated primarily through its effect on dysfunctional attitudes and self-esteem. Regarding drug use attributable to negative affect reduction, anxious attachment demonstrated direct, independent effects on both cigarette smoking and alcohol use. These findings highlight the potential importance of adult attachment styles as a risk factor for drug use among college students.

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## 1. Introduction

The need to belong represents a powerful and universal motivating force (Baumeister and Leary, 1995). This imperative for closeness is present during the earliest days and months of an infant's life (Bowlby, 1969), with a burgeoning literature clearly demonstrating that insecurely attached children are at greater risk to develop emotional and behavioral problems (Cicchetti, Toth, & Lynch, 1995; Sroufe, 1986). Put simply, people who experience intimate social bonds tend to be happier and healthier relative to those who lack such attachments (e.g., DeLongis, Folkman, & Lazarus, 1988; Leary, 1990). Other work further suggests an association between insecure adult attachment and psychological distress, including low self-esteem (Collins & Read, 1990; Griffin & Bartholomew, 1994; Gamble & Roberts, 2005; Roberts, Gotlib, & Kassel, 1996), negative emotional traits (Magai, Distel, & Liker, 1995), eating disorders (Cole-Detke & Kobak, 1996), depressive symptomatology (Kobak, Sudler, & Gamble, 1991; Roberts et al., 1996), and anxiety (Warren, Huston, Egeland, & Sroufe, 1997).

Given the strong relationships between various manifestations of psychological distress and substance use (e.g., Hussong & Chassin, 1994; Kassel, Stroud, & Paronis, 2003), there is reason to believe that attachment insecurity may also play a role in the developmental trajectory of substance use disorders. Several theorists, particularly those with psychodynamic orientations, have put forth such conceptualizations. For example, Cook (1991) argues that poor attachment in early childhood leads to internalized shame, which, in turn, leaves the child at risk for subsequent substance abuse. Walant (1995) similarly posits that persons vulnerable to alcohol and drug abuse have suffered neglect of their attachment needs and compensate by artificially inducing “merger” states through their use of drugs and alcohol. Kohut (1977) hypothesizes that addiction often arises when the individual has not received, or has failed to internalize, the comforting capacities of his or her early attachment figures. Though these conceptualizations may be compelling, to date, none have been empirically validated. Other recent thoughts on this issue, derived from a more cognitive-behavioral stance, also suggest that insecure attachment may set the stage for the development of substance abuse via negative affect regulation (e.g., use of drugs to assuage affective distress), and deficient socialization and association with deviant peers (Caspers, Cadoret, Langbehn, Yucuis, & Troutman, 2005; McNally, Palfai, Levine, & Moore, 2003; Sher, Walitzer, Wood, & Brent, 1991).

In fact, relatively few studies have actually examined the association between substance use and quality of adult attachment, and even fewer have begun to explore the potential etiological role of attachment style. Brennan and Shaver (1995) were the first to report that insecure attachment among college students was associated both with drinking frequency, and, even more strongly, with drinking alcohol in order to cope with stress. Other researchers have since reported similar links between insecure attachment and drinking behavior (Burge, Hammen, Davila, & Daley 1997; Cooper, Shaver, & Collins, 1998; Vungkhanching, Sher, Jackson, & Parra, 2004). Caspers, Cadoret, Langbehn, Yucuis, and Troutman (2005) found a high prevalence of illicit substance use among insecurely attached individuals relative to those secure in their attachment relationships. However, the only study to date to test a process model of the relationship between adult attachment style and substance use (specifically alcohol use) found that coping motives (drinking to relieve negative affect) mediated the relationship between attachment style and alcohol consumption (McNally et al., 2003). Hence, these investigators proposed that insecurely attached individuals appeared to drink as a means of regulating emotional distress.

The primary purpose of the present study was to build upon this emerging work and examine the magnitude and nature of the associations between adult attachment style and the use of cigarettes, alcohol,

and marijuana in a college student sample. Expanding upon our earlier work (Gamble & Roberts, 2005; Hankin, Kassel, & Abela, 2005; Roberts et al., 1996), we were also interested in assessing whether the relationship between attachment insecurity and various substance use indices is mediated by dysfunctional attitudes (e.g., maladaptive contingencies of self-worth; Kuiper, Olinger, & Lyons, 1986) and low self-esteem. Specifically, we hypothesized that insecurely attached individuals develop negative attitudes about themselves and others based on early attachment relationships, and that the activation of these dysfunctional attitudes depletes self-esteem, which, in turn, leads to increased substance use, particularly substance use attributable to stress and negative affect.

## 2. The hypothesized relationships and model

Examining first the relationship between attachment and dysfunctional attitudes, early attachment experiences have long been conceptualized as leading to enduring schemas about oneself and the world. Indeed, Bowlby (1969) was the first to propose that children internalize cognitive and affective representations of the self and others based on their early attachment experiences. He theorized that repeated interactions with the primary caregiver form a set of expectations and beliefs about the reliability and supportiveness of others, and that such beliefs influence notions of the self that further guide emotional experience and behaviors throughout life. He called these persistent attitudes and expectations “working models” of the self and others. Implicit in such a conceptualization is the notion that an insecurely attached child would be at heightened risk to develop a model of the self as unlovable and a model of others as unreliable or untrustworthy, cognitive schemas that would likely adversely influence future reactions to interpersonal stressors.

Ainsworth, Blehar, Waters, and Wall (1978) further refined this theory by identifying and measuring individual differences in attachment style among children, resulting in a model that included three prototypical attachment types: secure, anxious-avoidant and anxious-ambivalent. These types were derived primarily from observations of the reactions of children to separation from, and subsequent reconciliation with, their caregiver. Secure children were more willing to seek reassurance from the caregiver after being reunited and, as such, were easily comforted. Whereas anxious-avoidant children were more typically withdrawn or indifferent to the caretaker upon being reunited, anxious-ambivalent children were difficult to comfort, and vacillated between seeking proximity to the caregiver and expressing anger.

Although these attachment prototypes were originally investigated with children, there is burgeoning support for Bowlby’s hypothesis that these working models continue to exert influence in adult relationships. A self-report measure tapping the classic attachment categories was validated with adults by Hazan and Shaver (1987), and dimensional scales of adult attachment styles have subsequently been developed by a number of investigators (e.g. Bartholomew & Horowitz, 1991; Collins & Read, 1990). Studies using these adult measures have found that, in adulthood, peers and romantic partners do, indeed, serve as attachment figures (Fraley & Davis, 1997; Hazan & Zeifman, 1999). Although such attachment styles are not viewed as immutable, individual differences in attachment identified in childhood appear to be relatively stable over time (Fraley, 2002).

The concept of negative working models in insecurely attached adults bears a strong conceptual resemblance to the kind of “dysfunctional attitudes” about the self and world identified by Beck (1987) and others as a key component of depression. Classic depressogenic dysfunctional attitudes include rigid or extreme beliefs such as “I am nothing if a person I love doesn’t love me.” Consistent with this

theoretical perspective, empirical evidence of the relationship of insecure attachment to depressive dysfunctional attitudes has been found in a number of studies, and dysfunctional attitudes have been shown to mediate the relationship between insecure attachment and depression (Hankin et al., 2005; Roberts et al., 1996), whereas insecure attachment mediates the relationship between adverse parenting experiences and both dysfunctional attitudes and low self-esteem (Gamble & Roberts, 2005). It therefore seems likely that insecure attachment in childhood forms the basis for depressive dysfunctional attitudes about the self in adulthood, the first link in the proposed chain between attachment and substance use.

Although high levels of dysfunctional attitudes may increase an individual's propensity to develop affective distress and/or psychopathology, mere possession of dysfunctional attitudes does not inevitably lead to psychological distress. For example, an individual with the belief "I am nothing if a person I love doesn't love me" who does not experience rejection in the realm of love may not experience distress. In fact, low self-esteem has been frequently conceptualized as resulting (at least in part) from the activation of these underlying cognitive vulnerabilities reflective of rigid contingencies of self-worth (Roberts & Monroe, 1994; Segal & Muran, 1993). As such, an individual's level of self-esteem is representative of the extent to which the triggering of these cognitive structures has influenced the individual's sense of self.

Given the observed links between self-esteem and psychological distress, it is not surprising that low self-esteem has also been found to be related to substance abuse (Griffin-Shelley, Sandler, & Lees, 1990; Leary, Schreindorfer, & Haupt, 1995; Vega, Zimmerman, Warheit, Apospori, & Gil, 1993), and that prospective studies have found self-esteem to play an etiological role in substance abuse (Walitzer & Sher, 1996). Although the precise mechanism through which low self-esteem increases drug use is not fully known, theorists have suggested several possibilities, including increased use of alcohol and drugs to foster social acceptance into certain groups (Oetting & Donnermeyer, 1998), and use of alcohol or drugs to blunt negative emotions created by experiences of rejection or depression (Leary et al., 1995). Hence, drug use that is motivated by alleviation of negative affect seems particularly likely among insecurely attached individuals who possess low self-esteem, heightened negative emotionality, and fewer options for reducing distress through social support.

In summary, there is strong reason to believe that insecure attachment is intimately associated (perhaps causally) with dysfunctional attitudes about the self. When such cognitive vulnerabilities are activated, they adversely influence one's sense of self (self-esteem). Such depletions in self-esteem are thought to render individuals vulnerable to substance use and abuse. In the present study, we test the hypothesis that the relationship between insecure attachment and substance use is mediated by dysfunctional attitudes about the self and low self-esteem.

### 3. Methods

#### 3.1. *Participants and procedure*

The data reported in this paper were gathered as a part of a larger prospective investigation (see, e.g., Roberts, Kassel, & Gotlib, 1995; Roberts & Kassel, 1997; Roberts et al., 1996). All participants were enrolled in Introduction to Psychology classes and received course credit for their participation. An unselected sample of 225 students participated, with 212 participants (62% female) providing complete data sets. Participant ages ranged from 17 to 49 with a mean of 20.3 (S.D.=5.1). Testing was done in groups of 6 to 18 participants and was completed on two visits separated by 8 weeks. At visit 1,

participants completed measures of self-esteem, adult attachment styles, and dysfunctional attitudes. Substance use measures were administered at visit 2, and assessed both the frequency of drug use and use attributed to stress over the intervening 8-week period.

### 3.2. Measures

#### 3.2.1. Adult attachment styles

We used [Collins and Read \(1990\)](#) 18-item inventory as a measure of adult attachment dimensions. This questionnaire was developed by deconstructing [Hazan and Shaver \(1987\)](#) original categorical descriptions of attachment prototypes into individual sentences that were each rated separately. Factor analyses revealed three underlying dimensions: the extent to which an individual is comfortable with closeness (close), e.g., “I find it relatively easy to get close to others”; feels he or she can depend on others (depend), e.g., “I know that others will be there when I need them”; and is anxious or fearful about being abandoned or unloved (anxious), e.g., “I often worry about being abandoned” ([Collins & Read, 1990](#)). Subjects rated items on a five-point scale ranging from not at all characteristic (1) to very characteristic (5). In the present study, the obtained reliability ( $\alpha$ ) coefficients were .64 for close, .81 for depend, and .66 for anxious.

#### 3.2.2. Dysfunctional attitudes

The Dysfunctional Attitude Scale (DAS; [Weissman & Beck, 1978](#)) is a 40-item measure of the extent to which individuals’ self-worth and happiness are contingent upon meeting unrealistic standards of interpersonal approval (e.g., “I am nothing if a person I love doesn’t love me”) as well perfectionist standards of achievement (e.g., “If I fail partly, it is as bad as being a complete failure”). This measure has also been viewed as one which assesses cognitive structures (schemas) that heighten vulnerability to affective distress, particularly depressive symptomatology ([Segal & Swallow, 1994](#)). Items are rated on a seven-point belief scale. In the present study, the coefficient  $\alpha$  was .91.

#### 3.2.3. Self-esteem

The Rosenberg Self-Esteem Scale ([Rosenberg, 1979](#)) is a measure of global self-regard consisting of 10 items, e.g., “On the whole, I am satisfied with myself.” This questionnaire was scored on a five-point Likert scale and yielded a coefficient  $\alpha$  of .88 in the present study. Higher scores reflect greater self-worth.

#### 3.2.4. Drug use

At visit 2, participants were asked how often they had used alcohol, marijuana, and cigarettes, respectively, over the past 8 weeks. Response choices ranged from none (0) to everyday (5). They were also asked how often they used alcohol, cigarettes, and marijuana specifically as a means of coping with stress or negative affect (“when you felt worried, tense, or nervous”). These items were scored on a four-point Likert scale with response options ranging from never (0) to many times (3).

## 4. Results

### 4.1. Descriptive statistics and correlational analyses

Prevalence of substance use within the 8-week time frame (assessed at visit 2) was 39.6% for cigarette smoking (smoked on one or more occasions), 83% for alcohol use (one or more occasions), and 22.2% for

marijuana (one or more occasions). Regarding more frequent drug involvement, 13.7% of subjects reported smoking cigarettes on a daily basis, 17.9% drank alcohol several times a week, and 4.3% acknowledged smoking marijuana at least once a week. The prevalence of subjects responding “sometimes” or “many times” when asked about their use of substances in order to cope with stress was 18.9% for cigarette smoking, 12.2% for alcohol, and 3.3% for marijuana. Taken together, these findings are fairly consistent with national norms derived from similar age groups (Johnston, O’Malley, Bachman, & Schulenberg, 2005).

Gender differences were largely absent on the study variables. Men and women did not differ in the frequency in which they smoked cigarettes, drank, or smoked marijuana, nor did they differ in their stress-motivated use of these substances (all  $p$ 's > .10). Males and females did not differ on the attachment dimensions depend or anxious, whereas men did report finding it easier to get close to others (close attachment dimension) relative to women,  $t(210)=2.03$ ,  $p<.05$ . As reported in our previous study (Roberts et al., 1996), the depend and close dimensions were significantly correlated ( $r=.43$ ), as were the depend and anxious dimensions ( $r=-.33$ ). Hence, individuals who felt that significant attachment figures in their life were dependable, were more likely to experience closeness, and less likely to fear abandonment and not being loved. All three attachment dimensions were also significantly related to self-esteem and dysfunctional attitudes; insecure attachment was associated with lower self-esteem and greater endorsement of dysfunctional attitudes (see Table 1).

Of most relevance to the present study was the extent to which adult attachment dimensions were related to the substance use indices. With respect to the substance use frequency measures, cigarette smoking frequency was significantly associated with Anxious attachment ( $r=.22$ ). However, smoking was unrelated to the close and depend dimensions, and the alcohol and marijuana frequency measures were unrelated to all three attachment dimensions. Analyses of the association between attachment dimensions and the stress-related use of all three substances revealed significant correlations ( $p$ 's < .05) between anxious attachment and cigarette smoking ( $r=.26$ ), use of alcohol ( $r=.22$ ), and marijuana ( $r=.16$ ). In fact, partial correlational analyses, in which we respectively controlled for frequency of smoking and frequency of drinking, also revealed significant correlations between anxious attachment and both stress-motivated

Table 1  
Correlation matrix, possible ranges, means, and standard deviation of central variables

Measures	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Possible range	M	S.D.
(1) Cigarette-freq	–										0–5	1.3	1.8
(2) Alcohol-freq	.34 <sup>d</sup>	–									0–5	2.2	1.3
(3) Marijuana-freq	.41 <sup>d</sup>	.22 <sup>c</sup>	–								0–5	0.4	0.9
(4) Cigarette-stress	.85 <sup>d</sup>	.29 <sup>d</sup>	.42 <sup>d</sup>	–							0–3	0.5	0.9
(5) Alcohol-stress	.30 <sup>d</sup>	.40 <sup>d</sup>	.13	.38 <sup>d</sup>	–						0–3	0.4	0.7
(6) Marijuana-stress	.07	.07	.26 <sup>d</sup>	.13	.28 <sup>d</sup>	–					0–3	0.1	0.4
(7) Attach-anxious	.22 <sup>c</sup>	.09	.09	.26 <sup>d</sup>	.22 <sup>c</sup>	.16 <sup>a</sup>	–				0–24	9.9	5.1
(8) Attach-depend	–.07	.00	–.07	–.10	–.09	–.19 <sup>b</sup>	–.33 <sup>d</sup>	–			0–24	11.8	5.5
(9) Attach-close	–.06	.07	–.06	–.09	–.03	–.18 <sup>b</sup>	–.10	.43 <sup>d</sup>	–		0–24	15.4	4.6
(10) Self-esteem	–.24 <sup>d</sup>	–.08	–.21 <sup>c</sup>	–.28 <sup>d</sup>	–.22 <sup>c</sup>	–.25 <sup>d</sup>	–.45 <sup>d</sup>	.28 <sup>d</sup>	.30 <sup>d</sup>	–	0–40	30	7.6
(11) DAS	.10	.03	.06	.09	.10	.22 <sup>c</sup>	.34 <sup>d</sup>	–.25 <sup>d</sup>	–.23 <sup>c</sup>	–.51 <sup>d</sup>	0–240	80.7	30.2

N=212. All scores presented as raw scores. DAS=Dysfunctional Attitude Scale.

<sup>a</sup> $p<.05$ , <sup>b</sup> $p<.01$ , <sup>c</sup> $p<.005$ , <sup>d</sup> $p<.001$ .

smoking ( $p = .14$ ) and stress-motivated drinking ( $p = .20$ ). The depend and close attachment dimensions were both significantly related to the stress-motivated use of marijuana  $r = -.19$  and  $r = -.18$ , respectively. Finally, all of the drug use indices except frequency of drinking were negatively associated with self-esteem, whereas with one exception (stress-motivated use of marijuana,  $r = .22$ ), none of the other substance use variables exhibited significant associations with dysfunctional attitudes.

#### 4.2. Tests of the conceptual model

##### 4.2.1. Drug use frequency

Having found significant correlations among several of the drug use variables and the attachment dimensions, we next proceeded to test the hypothesized path model. Again, we predicted that attachment security would be associated with dysfunctional attitudes measured at the same point in time. Dysfunctional attitudes, in turn, were expected to contribute to the variance in self-esteem, also measured at visit 1. Finally, it was anticipated that self-esteem would make the only direct contribution to drug use assessed 8 weeks later at visit 2.

In order to test the model, we conducted three simultaneous regression analyses (cf. Nolen-Hoeksema, Parker, & Larsen, 1994; Roberts et al., 1996). In the first, the criterion variable was dysfunctional attitudes, and predictor variables were the three attachment dimensions. This equation was significant,  $R^2 = .16$ ,  $F = 13.3$ ,  $p < .001$ . (See Fig. 1 for the displayed standardized  $\beta$  weights of each variable after controlling for the effects of all other variables in each equation.) Inspection of the left half of the figure shows that subjects who were anxious about attachment relations (anxious), as well as those who reported difficulties becoming close to others (close), endorsed more dysfunctional attitudes. However, the extent to which subjects felt that they could depend on significant others was unrelated to endorsement of dysfunctional attitudes.

In the second regression analysis, the criterion variable was self-esteem and the predictor variables included the three attachment dimensions and dysfunctional attitudes. The squared multiple correlation was  $.38$  ( $F = 31.67$ ,  $p < .001$ ). Consistent with our previous work (Roberts et al., 1996), inspection of

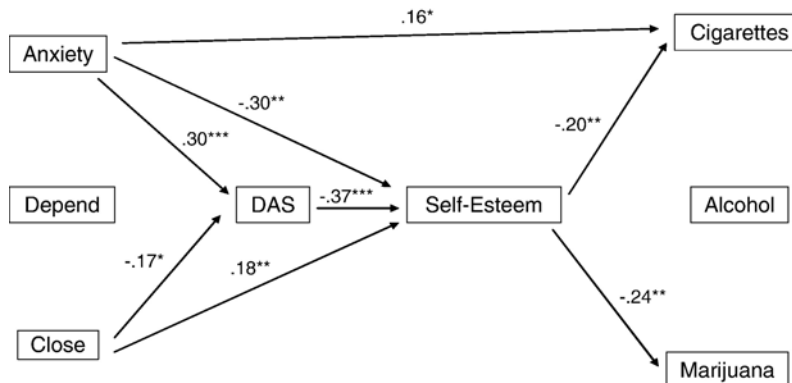


Fig. 1. Path model in which smoking, drinking, and marijuana frequency of use are predicted from attachment styles, dysfunctional attitudes, and self-esteem. Anxiety=anxiety attachment dimension; depend=depend attachment dimension; close=close attachment dimension. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Fig. 1 reveals that subjects who were more anxious about their attachment relationships (anxious), reported difficulties with closeness (close), and endorsed more dysfunctional attitudes experienced lower self-esteem.

In the third analysis, we utilized multivariate regression in which the multiple criterion variables were frequency of cigarette smoking, alcohol use, and marijuana use. We chose a multivariate approach in order to control for colinearity (see Table 1) among the drug use frequency indices. Multivariate and univariate effect tests were then conducted on each predictor variable. Beginning with self-esteem, the multivariate effect test was significant (Wilks  $\lambda = .96, p < .03$ ). Univariate  $F$  tests revealed that self-esteem was significantly associated with frequency of smoking ( $F = 5.47, p < .03$ ) and marijuana use ( $F = 7.82, p < .007$ ), but not with alcohol consumption ( $p > .20$ ). We next examined whether dysfunctional attitudes exert a direct influence on the substance use frequency measures. The multivariate test for dysfunctional attitudes was non-significant. Finally, we conducted effect tests on the three attachment dimensions. The multivariate tests for both the depend and close attachment dimensions were non-significant, as were the univariate  $F$  tests. Though the multivariate test for anxious attachment was also non-significant, inspection of the univariate tests revealed a significant, direct effect of anxious attachment on frequency of cigarette smoking ( $F = 4.20, p < .05$ ). Thus, even when controlling for the impact of the other attachment dimensions, dysfunctional attitudes, and self-esteem, anxious attachment makes a direct contribution to frequency of cigarette smoking assessed 8 weeks later.

4.2.2. Stress-motivated drug use

The next set of analyses focused on the contributions of the attachment dimensions, dysfunctional attitudes, and self-esteem to the stress-motivated use of cigarettes, alcohol, and marijuana (see Fig. 2). Again, multivariate regression analyses were conducted with the three stress-motivated drug use indices serving as multiple criterion variables. Beginning with self-esteem (as the standardized  $\beta$  weights are identical to those shown in Fig. 1 up to self-esteem’s entry into the model), the multivariate test was significant (Wilks  $\lambda = .95, p < .02$ ). Univariate  $F$  tests revealed that self-esteem is associated with stress-motivated cigarette smoking ( $F = 8.08, p < .006$ ), alcohol consumption ( $F = 4.57, p < .004$ ), and marginally

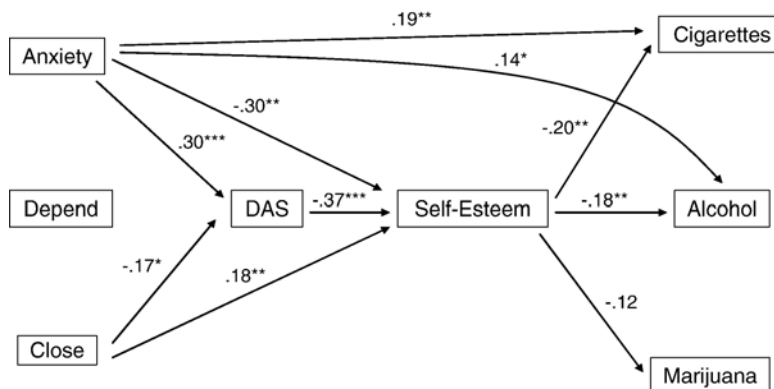


Fig. 2. Path model in which smoking, drinking, and marijuana use attributable to stress and/or negative affect are predicted from attachment styles, dysfunctional attitudes, and self-esteem. Anxiety= anxiety attachment dimension; depend= depend attachment dimension; close=close attachment dimension. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .



so with marijuana use ( $F=3.04, p<.09$ ). The multivariate test for dysfunctional attitudes was non-significant. Multivariate and univariate tests of the depend and close attachment dimensions also yielded non-significant results. Analyses of the anxious attachment dimension, however, revealed a marginally significant Wilks  $\lambda$  of .97 ( $p<.07$ ), and significant  $F$  tests for both stress-motivated cigarette smoking ( $F=5.93, p<.02$ ) and alcohol use ( $F=3.91, p<.05$ ). Thus, even when controlling for the effects of the other attachment dimensions, dysfunctional attitudes, and self-esteem, anxious attachment makes a direct contribution to the stress-motivated use of both cigarettes and alcohol.

## 5. Discussion

The pathways leading to substance use and abuse are no doubt complex, involving numerous contextual, interpersonal, and intrapersonal factors (Kassel, Weinstein, Skitch, Veilleaux, & Mermelstein, 2005). In the present study, we attempted to examine the possible role played by attachment styles in promoting drug use among college students. Based on a burgeoning literature pointing to strong associations between insecure attachment styles and emotional distress, we hypothesized that maladaptive attachment styles would be related to increased substance use, particularly use attributable to the relief of stress and negative affect. Moreover, based on our previous work, we posited that any observed relationships between attachment style and drug use would be mediated via dysfunctional attitudes and self-esteem. In general, our findings supported these predictions.

At the level of correlational analyses, anxious attachment was significantly and positively associated with the use of cigarettes, but not with alcohol or marijuana. The alcohol finding makes some sense in that alcohol use is both socially and statistically normative among college students (Johnston et al., 2005). The lack of an association with frequency of marijuana use may be attributable, in part, to the relatively low base rate of such behavior in the present sample. However, with respect to drug use attributable to stress, as anticipated, anxious attachment was significantly correlated with the use of all three substances. Thus, the higher their scores on the anxious attachment subscale, the more likely the students were to smoke more cigarettes and marijuana, and drink more alcohol in response to feelings of distress. Also of note, whereas the depend and close attachment styles emerged as significant (negative) correlates of stress-attributed marijuana use, they demonstrated a non-significant relationship with smoking and alcohol consumption. Together our findings suggest that fears of abandonment (anxious attachment) is the most important aspect of insecure attachment in terms of predicting substance use, though further research will clearly be needed to determine if this pattern emerges as a reliable finding.

Consistent with previous studies, self-esteem also exhibited a significant and negative correlation with all of the substance use indices, except for frequency of alcohol use. The lack of an observed relationship with frequency of alcohol use (but not with stress-motivated alcohol use) is once again likely to be understood in terms of alcohol consumption representing normative behavior among college students. Interestingly, whereas consistent with previous research, the construct of dysfunctional attitudes was correlated in the expected direction (negatively) with self-esteem and all three attachment styles, it demonstrated little association with any of the drug use indices, except for stress-attributed marijuana use. Although the construct of dysfunctional attitudes has been studied most often in the context of its relationship with depressive symptomatology (e.g., Hankin et al., 2005; Roberts et al., 1996), based on our findings, it appears that it shares little direct variance with substance use behaviors.

It is important to reiterate that we elected to conduct two parallel sets of analyses, examining the influence of attachment style, dysfunctional attitudes, and self-esteem on drug use frequency and then

drug use specifically attributed to stress and/or negative affect. Our thinking was that there is strong reason to believe that the latter—drug use in response to, or motivated by attempts to cope with, affective distress—is more strongly linked to problematic outcomes (e.g., Kassel et al., 2003; Kassel, Jackson, & Unrod, 2000; Plancherel, Bolognini, Stephan, Laget, Chinet, Bernard, & Halfon, 2005). Indeed, negative reinforcement models of substance abuse and addiction have been highly influential in shaping substance abuse theory (e.g., Baker, Piper, McCarthy, Majeskie, & Fiore, 2004; Kassel, Veilleux, Wardle, Yates, Greenstein, & Evatt, *in press*), as well as treatment (e.g., Hass, Munoz, Humfleet, Reus, & Hall, 2004). Several interesting differences emerged from the two analyses. Regarding drug use frequency, any influence attachment style appeared to exert operated primarily through dysfunctional attitudes and self-esteem, with the exception of cigarette smoking, where anxious attachment made a unique contribution to outcome. Regarding stress-motivated drug use, however, anxious attachment made an independent contribution to the variance in both smoking and alcohol use. Thus, as anticipated, an insecure attachment style appears to exert even stronger influence over drug use attributed to the relief of affective distress. Finally, it is important to note that, as far as we are aware, this is the first study to demonstrate a relationship between adult attachment and cigarette smoking. Hopefully, these findings will spur further research on this intriguing association.

Several limitations of the study need to be acknowledged. Even though measures were assessed at two points in time separated by 2 months, the design was still ultimately cross-sectional in the sense that baseline substance use was not measured. Thus, future work in this area should examine our model utilizing a prospective design that controls for baseline drug use behavior. Indeed, one study demonstrated that, when assessed during adolescence, attachment predicted onset of drug use 4.5 years later in young adulthood (though even this study was also limited in the causal inferences it could draw by its cross-sectional design; Cooper, Albino, Orcutt, & Williams, 2004). Also, whereas the target population (college students) of the present study is an important one for whom drinking, smoking, and marijuana use may be salient problematic behaviors, the extent to which this patterning of findings would be found in older, more established substance users and abusers is as yet unknown. Correspondingly, the role that attachment styles may play in the promotion of drug *dependence* remains unclear (though see Vungkhanching et al., 2004). Finally, although one could argue that, as measured, adult attachment dimensions may simply serve as proxies for other, more “basic” emotions (e.g., anxiety), there is strong reason to believe that adult attachment, though modestly correlated with measures of emotion, represents a unique construct that can actually predict changes in depressive and anxiety symptoms (Hankin et al., 2005).

In summary, insecure attachment, specifically anxiety over possible abandonment (Anxious attachment), proved to be significantly related to both frequency of substance use and stress-motivated use of substances. This effect appeared to operate largely through dysfunctional attitudes about the self and self-esteem, lending support to the hypothesized model. Therefore, a plausible etiological process linking insecure attachment and substance use is that insecurely attached individuals develop dysfunctional attitudes about themselves such that when these underlying insecurities are activated, they deplete the individual’s self-esteem. Such low self-esteem enhances the likelihood of more drug use and, perhaps more importantly, more stress-motivated use of substances. The precise manner through which low self-esteem predisposes to drug use and misuse, however, has yet to be clearly delineated. Yet, there is strong reason to believe that drugs as pharmacologically distinct as alcohol, nicotine, and marijuana may all be used, at least by some individuals, in order to dampen stress or alleviate negative affect. Hence, the extent to which low self-esteem engenders psychological distress in the form of negative

affect needs to be examined further in the context of better elucidating the link between attachment style and drug use.

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