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Attachment in Relation to Affect Regulation and Interpersonal Functioning among Substance Use  
Disorder Inpatients

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### **Abstract**

Attachment theory has been conceptualised as an affect regulation theory, proposing that attachment is associated with the expression and recognition of emotions as well as interpersonal functioning. Previous research has reported affect regulation difficulties in substance use disorders and addiction has been considered an attachment disorder. However, scarce empirical research exists on the relationship of attachment in relation to affect regulation and interpersonal functioning in those with substance use problems. Thus, the objective of the present study was to investigate potential associations between attachment, Negative Mood Regulation (NMR) expectancies, fear of intimacy and self-differentiation in substance abusers. The Revised Adult Attachment Scale (RAAS), the NMR Expectancies Scale, the Fear of Intimacy Scale and the Differentiation of Self Inventory were administered to a sample of 100 substance use disorder inpatients. Attachment accounted for significant variance in NMR expectancies and was also a strong predictor of fear of intimacy. The predictive utility of attachment also extended to self-differentiation, suggesting that attachment was strongly related to overall self-differentiation score, Emotional reactivity, Emotional cut-off and I position. These findings support attachment theory suggesting that attachment is associated with and predicts affect regulation abilities and difficulties in interpersonal functioning in a sample of substance use disorder inpatients. Thus, the inclusion and assessment of attachment appears to be important in the development of treatment programs for substance abusing individuals.

*Keywords:* Substance use disorder; Attachment; NMR expectancies; Interpersonal functioning

Attachment is associated with the expression and regulation of emotion (Cassidy, 1994; Mikulincer & Shaver, 2007; Thompson, 1999). Early attachment theory postulates that bonding with a significant caregiver is essential for the development of internal working models for communication, regulation of emotions and interpersonal behaviour (Bowlby, 1973; Sroufe & Fleeson, 1986). These early attachment experiences are associated with adult attachment styles. Adult attachment styles are relatively stable and influence attitudes, emotions, affect regulation and behavioural strategies in relationships (Gillath & Shaver, 2007; Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2002). Empirical evidence has indicated associations between insecure adult attachment, fear of intimacy and emotion regulation difficulties (Bekker, Bachrach, & Croon, 2007; Hazan & Shaver, 1987) and between secure adult attachment and a higher capacity for intimacy, emotional awareness and empathy (Feeney, 1996; Laible, 2007). Substance abuse has been proposed to be a consequence of emotion regulation difficulties (Magai, 1999; Taylor, Bagby, & Parker, 1997) with individuals using alcohol/drugs to avoid intimacy or rejection, to ease pain, anger and ambivalence and possibly establish a “secure base” (Hofler & Kooyman, 1996). Moreover, addiction has been proposed to be an attachment disorder (Flores, 2001, 2004) and research suggests that insecure attachment is associated with alcohol consumption, harmful drinking patterns and substance use disorders (Cooper, Shaver, & Collins, 1998; Finzi-Dottan, Cohen, Iwaniec, Sapir, & Weizman, 2003; McNally, Palfai, Levine, & Moore, 2003; Thorberg & Lyvers, 2006; Vungkhanching, Sher, Jackson, & Parra, 2004).

Negative mood regulation (NMR) expectancies are beliefs regarding a person’s ability to terminate or alleviate a negative mood state (Catanzaro & Mearns, 1990). The concept of NMR expectancies was developed within the framework of social learning theory (Rotter, 1954), but is also associated with self-regulation theory (Carver & Scheier, 1998). High NMR presumably reflects the ability to cope successfully with bad moods, whereas low NMR may lead to maladaptive or less efficacious ways of coping (Kassel, Bornoalova, & Mehta, 2007). Evidence

suggests that low NMR expectancies predict avoidant coping, depression, physical symptoms and problem drinking (Catanzaro & Greenwood, 1994; Catanzaro & Laurent, 2004; Davis, Andresen, Trosko, Massman, & Lovejoy, 2005; Flett, Blankstein, & Obertynski, 1996). Furthermore, NMR expectancies have been negatively associated with anxiety and depression, and positively associated with active coping strategies (Kassel et al., 2007; Kassel, Jackson, & Unrod, 2000). In addition, research in college students have found associations between parental attachment and NMR expectancies (Creasy & Ladd, 2004; McCarthy, 1998; McCarthy, Lambert, & Moller, 2006; McCarthy, Moller & Fouladi, 2001) and individuals with insecure attachment orientations report less confidence in their ability to regulate moods compared to secure individuals (Creasey, Kershaw, & Boston, 1999). Creasy and Ladd (2004) also found that the relationship between NMR and the ability to resolve conflict with a partner was mediated by attachment representations, highlighting the importance of attachment as a mechanism of the ability to cope with negative feelings and resolve conflict in close relationships.

Interestingly, a study by Moller et al. (2002) found that individuals with “earned attachment security”, described as the ability to maintain high levels of interpersonal functioning in spite of growing up in a problematic childhood environment, reported similar coping resources and abilities to handle psychological stress as individuals with secure childhood attachment orientations. A recent clinical study in a mixed psychiatric sample (Cloitre, Stovall-McClough, Zorbas, & Charuvastra, 2008) suggested that insecure attachment was related to psychiatric disorders through mood regulation self-efficacy and expectancies of social support. Given that attachment difficulties are associated with various psychiatric disorders (Cloitre, et al., 2008; Dozier, Stovall, & Albus, 1999; Westen, Nakash, Thomas, & Bradley, 2006) and limited research exists in substance samples, there is a need to examine attachment and NMR since addicts often report using alcohol and drugs as a way of coping with bad feelings (McNally et al., 2003).

Besides, some have argued that fear of intimacy (FIS) is associated with mental health issues and substance use problems (Descutner & Thelen, 1991). Descutner and Thelen defined FIS as “the inhibited capacity of an individual, because of anxiety, to exchange thoughts and feelings of personal significance with another individual who is highly valued” (p.219). FIS research to date has largely reported significant associations with loneliness, lack of self-disclosure, low social interaction and poor relationship quality (Descutner & Thelen, 1991; Doi & Thelen, 1993). However, scarce evidence exists regarding the relationships between attachment, FIS and NMR as well as the predictive utility of attachment in relation to FIS.

Differentiation of self is defined as the degree to which an individual is able to balance emotional and intellectual functioning, intimacy and autonomy in relationships (Bowen, 1976, 1978). Well-differentiated individuals are characterised by an ability to distinguish between feelings and intellectual processes; experience intimacy with, and autonomy from, their partner; and exhibit good psychological adjustment (Kerr, 1988; Kerr & Bowen, 1988). Individuals with lower self-differentiation experience higher levels of chronic anxiety, emotion regulation difficulties, mood disturbances and substance abuse. Cross-sectional evidence suggests that self-differentiation is a cognitive factor associated with the use of effective problem solving skills to manage anxiety (Knauth, Skowron, & Escobar, 2006). Furthermore, research has reported negative associations of self-differentiation with perceived stress and distress, and a positive association between self-differentiation and psychological well-being (Bohlander, 1999; Greene, Hamilton, & Rolling, 1986; Knauth et al., 2006; Murdock & Gore, 2004). A study in a community sample reported associations between insecure attachment and the four dimensions of the self-differentiation measure: Emotional reactivity (ER), Emotional cut-off (EC), I position (IP) and Fusion with others (FO). Insecure attachment explained 40% of the variance in ER, EC, IP and FO (Skowron & Dendy, 2004). Yet, although self-differentiation involves the capacity to moderate affect, there is scarce knowledge

about the relationship with attachment and mood regulation in substance abusers, where affect regulation abilities are likely to be impaired.

To date, research has investigated attachment, mood regulation and relationship functioning in college students and mixed diagnostic groups, with evidence suggesting that attachment security may be an important psychological resource for interpersonal functioning (Moller et al., 2002). However, these findings may not be generalisable to substance abusers. Previous studies among substance use disorders have reported higher levels of mood regulation and interpersonal difficulties compared to controls (Lyvers, Thorberg, Dobie, Huang, & Reginald, 2008; Thorberg & Lyvers, 2005, 2006) highlighting the importance of further research on attachment in relation to NMR and self-differentiation.

Given the potential clinical implications for this type of knowledge, investigating these factors in substance abusers may help clinicians and researchers obtain a more complete understanding of the relationships between attachment organisation, affect regulation and relationship functioning, to make informed choices about treatment and research within that context. Particularly since the outcomes of substance use disorder treatment programs are modest and relapse rates are high (Collins & Bradizza, 2001; Feeney, Connor, Young, Tucker, & McPherson, 2006). Thus, the objective of the present study was to investigate the relationships between attachment dimensions, mood regulation, FIS and self-differentiation as well as the predictive utility of attachment with NMR expectancies, FIS and self-differentiation in a substance abusing sample.

## Method

### *Participants*

Participants were recruited from inpatient alcohol and drug rehabilitation centres in Queensland, Australia. The sample consisted of 58 males and 42 females with a mean age of 36.2 years ( $SD = 10.10$ ) and participants were at least 18 years old. 43 patients were treated for alcohol dependence, 17 for cannabis dependence, 21 for heroin dependence and 19 for amphetamine abuse



or cocaine abuse. Patients were diagnosed in accordance with DSM-IV-TR criteria (APA, 2000) by a general practitioner before being admitted to the treatment centres or diagnosed by a psychiatrist after admittance. No incentive was offered for participation. The research investigation's protocol was approved by the Bond University Human Research Ethics Committee prior to data collection.

### *Measures*

The Revised Adult Attachment Scale (RAAS) (Collins, 1996; Collins & Read, 1990) is an 18-item measure of adult attachment dimensions. It consists of three subscales: Close, Depend and Anxiety. The Close subscale measures the level of comfort the individual feels with closeness and intimacy. The Depend subscale assesses if the individual feels they can depend on others to be available when needed. The Anxiety subscale measures the level of anxiety the person feels about being rejected or unloved. High scores on Close and Depend, and low scores on the Anxiety dimension, indicate a secure attachment style (Collins, 1996; Collins & Read, 1990). Each item is scored on a 5-point Likert scale with some items being reverse scored. The RAAS has demonstrated adequate validity and reliability (Collins & Read, 1990). In the present investigation, the Cronbach alphas were .86 for Anxiety, .63 for Depend and .56 for Close, respectively. It should be pointed out that the RAAS does not assess attachment styles, but continuous attachment dimensions hypothesised to underlie adult attachment (Collins, 1996; Goldman & Anderson, 2007).

The Negative Mood Regulation (NMR) scale (Catanzaro & Mearns, 1987, 1990) is a 30-item questionnaire designed to assess generalized expectancies to alleviate negative moods by an individual's own efforts. Subjects are asked to indicate the degree to which they believe their use of various coping strategies can counteract a negative mood state. A high score indicates a strong belief in an individual's ability to alleviate their own negative affect. Each item is scored on a 5-point Likert scale. Research studies have established discriminant validity from depression, social desirability and locus of control (Catanzaro & Greenwood, 1994; Catanzaro & Mearns, 1990;

Mearns, 1991) and reported sound psychometric properties (Catanzaro & Mearns, 1990; Mearns, 1991). In the current study, the Cronbach alpha was .88.

The Fear of Intimacy Scale (FIS) consists of 35 items measuring how inhibited an individual feels to share thoughts and feelings of personal significance in relation to another valued individual (Descutner & Thelen, 1991). Each item is scored on a 5-point Likert scale. A high score on the FIS suggests a high fear of intimacy. The FIS has shown sound reliability and internal consistency (Descutner & Thelen, 1991; Terrell, Terrell, & Von Drashek, 2000). In the current investigation, the Cronbach alpha was .87.

The Differentiation of Self Inventory (DSI) (Skowron & Friedlander, 1998) is a 43-item scale designed to measure an individual's significant relationships and current relations with the family of origin using a 6-point Likert scale. The DSI consists of four subscales: Emotional reactivity (ER), I position (IP), Emotional cut-off (EC) and Fusion with others (FO). The ER subscale measures the degree to which the individual reacts to the environment with emotional flooding. The IP items describe the ability to adhere to one's convictions in spite of external pressure. The EC subscale measures feelings of being vulnerable and threatened by intimacy in relation to others. The FO subscale reflects emotional over-involvement as well as over-identification with parents. Higher scores on all scales indicate greater differentiation of self. The DSI has shown acceptable psychometric properties (Skowron, 2000; Skowron & Friedlander, 1998; Tuason & Friedlander, 2000). The Cronbach alphas for DSI, ER, EC, IP and FO in the current study were .80, .64, .77, .76 and .48 respectively.

### *Procedure*

Participants were recruited from three inpatient alcohol and drug rehabilitation centres in Queensland, Australia. A prerequisite for participation was that subjects had been abstinent at least 2-3 weeks prior to assessment (as evidenced by regular urine testing at the alcohol and drug treatment centres), to avoid residual alcohol/drug effects. Potential participants were brought into a

room together with the researcher and the director of the treatment centre, given information about the study and asked if they would like to participate. Clients not wanting to participate left the room whereas those interested in participation completed the questionnaires in groups of 20. Instructions specified that no identifying information was to be written on any of the questionnaires, ensuring anonymity of all responses. An explanatory statement with participation requirements and goals of the study was attached to the questionnaires.

## Results

### *Correlational analysis*

The relationships between the predictor and criterion variables were investigated by the use of Pearson correlations (see Table 1). Table 1 also shows the means and standard deviations of all the measures in the present study. Analyses were conducted to ensure no violations of linearity and normality, and no multicollinearity of residuals (Tabachnick & Fidell, 2007).

### *Hierarchical Regression Analyses*

A series of 7 hierarchical regression analyses (HRA) were undertaken to investigate the predictive utility of attachment dimensions in relation to NMR expectancies, FIS and self-differentiation. Analyses were conducted to ensure no violations of normality and linearity and no multicollinearity of residuals (Tabachnick & Fidell, 2007). Hypothesis testing began by examining the relative contribution of the sociodemographic variables (age, gender) and secondly the RAAS attachment dimensions Close, Depend and Anxiety towards NMR expectancies. Sociodemographic variables were entered in step 1 and showed that age and gender did not significantly contribute to predict NMR expectancies. The attachment dimensions were entered in step 2 and predicted 7.7% ( $R^2 = 0.077, p < .007$ ) of the variance in NMR. An inspection of the whole model revealed that Anxiety ( $\beta = -.35, p < .004$ ) was the only significant predictor of NMR expectancies as shown in Table 2.

The second HRA followed the same format as the previous regression analysis except that FIS was entered as the criterion variable. Age and gender did not account for any significant variance, but attachment predicted 27.8% ( $R^2 = 0.278$ ,  $p < .0005$ ) of the variance in FIS. In the overall model the Anxiety ( $\beta = .25$ ,  $p < .018$ ) and Close ( $\beta = -.42$ ,  $p < .0005$ ) dimensions added significant variance towards FIS (see Table 2).

In the third HRA self-differentiation was the criterion variable. No significant contribution of age and gender were found in model 1, and the attachment factors accounted for 31.8% ( $R^2 = 0.318$ ,  $p < .0005$ ) of variance towards total self-differentiation score (see Table 3). When the full model was examined Anxiety ( $\beta = -.43$ ,  $p < .0005$ ) and gender ( $\beta = -.19$ ,  $p < .027$ ) added significant variance towards self-differentiation. The Close ( $\beta = .20$ ,  $p > .05$ ) dimension also approached significance.

As shown in Table 3 the fourth HRA investigated the relationship between attachment and Emotional reactivity (ER). No significant contribution of age and gender were found in the first model, but attachment factors accounted for 22.4% ( $R^2 = 0.224$ ,  $p < .0005$ ) of variance towards ER. When the full model was examined Anxiety ( $\beta = -.47$ ,  $p < .0005$ ) and gender ( $\beta = -.22$ ,  $p < .016$ ) were significant predictors of ER.

In the fifth HRA the Emotional cut-off (EC) scale was entered as the criterion variable. Age and gender did not account for any significant variance in EC, but attachment predicted 37.2% ( $R^2 = 0.372$ ,  $p < .0005$ ) of the variance towards EC. In the overall model the Anxiety ( $\beta = -.33$ ,  $p < .001$ ) and Close ( $\beta = .41$ ,  $p < .0005$ ) dimensions added significant variance towards EC as presented in Table 4.

In the sixth HRA the relationship between attachment and I position (IP) was examined. No significant contributions of age and gender were found in the first model, but attachment factors accounted for 15.7% ( $R^2 = 0.157$ ,  $p < .001$ ) of variance towards IP. When the full model was inspected, the Close dimension ( $\beta = .25$ ,  $p < .026$ ) and gender ( $\beta = -.20$ ,  $p < .031$ ) significantly

contributed towards IP (see Table 4). A seventh HRA was undertaken on the predictive utility of attachment dimensions towards Fusion with others (FO), however the model was non-significant.

### Discussion

This study examined associations between attachment, NMR expectancies, FIS and self-differentiation in clients undergoing inpatient treatment for substance use disorders. As expected, total mean scores on the Close and Depend attachment dimensions were lower in the present substance abusing sample and higher on the Anxiety dimension compared to a student/ community sample (Close:  $M = 3.65$ ,  $SD = 0.79$ ; Depend:  $M = 3.28$ ,  $SD = 0.78$ ; Anxiety:  $M = 2.37$ ,  $SD = 0.92$ ) (Lyvers et al., 2008). A similar pattern of results was also found in another community sample (Close:  $M = 3.80$ ,  $SD = 0.91$ ; Depend:  $M = 3.00$ ,  $SD = 0.75$ ; Anxiety:  $M = 1.84$ ,  $SD = 0.85$ ) (Eng, Heimberg, Hart, Schneier, & Liebowitz, 2001). This suggests that addicts in the present study have significantly higher levels of insecure attachment compared to student and community samples.

Furthermore, two studies in student samples obtained a total mean score for NMR expectancies of  $M = 104.52$ ,  $SD = 16.56$  and  $M = 103.32$ ,  $SD = 15.38$ , respectively (Kassel et al, 2000; 2007). By comparison, the overall mean score in the present abuse sample was  $M = 95.28$ ,  $SD = 17.80$  providing evidence for less confidence in mood regulation abilities among substance abusers. In addition, anxious attachment predicted 7.7% of the variance in NMR expectancies even after controlling for age and gender, suggesting that anxious attachment is associated with lesser abilities to regulate one's negative moods. This is in accordance with other research evidence (Bekker et al., 2007; Collins, 1996; Simpson, Rholes, & Phillips, 1996) and attachment theory (Main, 1996; Mikulincer & Shaver, 2007) suggesting that insecurely attached individuals tend to show poor affect regulation.

The present study also found higher fear of intimacy scores among the substance use disorder patients compared to a student sample ( $M = 79.58$ ,  $SD = 21.57$ ) (Doi & Thelen, 1993).

Similarly, the overall FIS mean score among rape victims was also lower compared to the present

substance users ( $M = 88.10$   $SD = 24.10$ ) as well as compared to a control sample ( $M = 78.30$ ,  $SD = 22.70$ ) indicating more problems with intimacy among substance abusers (Thelen, Sherman, & Borst, 1998). Furthermore, attachment was also a strong predictor of FIS, even after controlling for the effect of age and gender. More specifically, the Close dimension appeared to be the strongest contributor, followed by Anxiety. Thus, the present results suggest that adult attachment is related to difficulties in intimacy and interpersonal functioning, in accordance with previous evidence that reported a significant association between insecure attachment and relationship problems as well as lower levels of trust, interdependence and commitment (Cyranowski et al., 2002; Simpson, 1990). This is in line with attachment theory proposing that individuals with a fearful attachment style long for intimacy, but avoid close relationships for fear of rejection (Bartholomew & Horowitz, 1991). Thus, some substance abusers may self-medicate to reduce their fear of intimacy (see Khantzian, 2003) or help them cope with intimacy in close relationships, at least for a short period of time. However, due to the low reliability of the Close dimension in the present study, these results need to be interpreted with caution.

As expected, overall self-differentiation mean score as well as the DSI subscores from a combined student/community sample were higher than the present substance abusers scores (DSI = 162.53,  $SD = 23.04$ ; ER = 39.12,  $SD = 8.93$ ; EC = 51.05,  $SD = 9.06$ ; IP = 44.62,  $SD = 9.86$ ; FO = 28.73,  $SD = 6.54$ ) indicating higher levels of interpersonal functioning and relationship quality among adult controls (Thorberg & Lyvers, 2006). However, the fusion with other scores are similar the two across samples with FO being slightly lower in addicts ( $M = 28.45$ ,  $SD = 6.33$ ) compared to controls ( $M = 28.76$ ,  $SD = 6.54$ ). Given the low reliability of this scale (Cronbach's alpha of 0.48) this is not a surprising finding and questions the reliability of the current FO data in the present sample.

The predictive utility of attachment also extended to self-differentiation, suggesting that the anxious attachment dimension, and to a lesser extent gender, contributed to the prediction of

differentiation of self. More specifically, an inverse relationship between the anxious attachment dimension and differentiation of self was evident. Additionally, gender accounted for some of the variance in self-differentiation, such that females had higher levels of self-differentiation compared to males. This suggests that females may be better on average at maintaining their autonomy and sense of self in interpersonal relationships (see Bowen, 1978; Skowron & Friedlander, 1998). Some have noted that attachment and self-differentiation are associated with various characteristics of interpersonal experiences, but share two underlying dimensions: the need for intimacy and the need for autonomy (Skowron & Dendy, 2004). Attachment dimension scores from the current study explained significant variance in self-differentiation. Given the present findings we speculate that attachment dimensions may be associated with the development of self-differentiation, as previous research has reported that attachment style appears to be stable across infancy, childhood, adolescence and early adulthood (Thompson, 1999; Weinfield, Whaley, & Egeland, 2004). However, whether attachment dimensions and styles have the same level of stability over time is unknown at present and should be investigated. In addition, factor analytic studies should be undertaken to elucidate whether attachment dimensions and self-differentiation are distinct constructs, and prospective research undertaken to clarify whether attachment dimensions are causal factors of self-differentiation.

The present investigation also found that the anxious attachment scores significantly predicted emotional reactivity (ER), with gender also contributing towards this prediction after controlling for age. These data support the predictive power of anxious attachment in relation to being more emotionally reactive, having difficulties with emotion regulation, and maladjustment in those with substance dependence (Skowron & Friedlander, 1998). Similarly, evidence indicates moderate to strong correlations between anxious attachment and ER (Skowron & Dendy, 2004; Thorberg & Lyvers, 2006). A gender difference was also evident in ER consistent with previous

evidence reporting a significant association between being female and higher ER (Skowron & Friedlander, 1998).

The predictive utility of attachment dimensions was also shown for Emotional cut-off (EC) scores after controlling for sociodemographic variables, with Close and Anxious attachment scores contributing to this prediction. This is in line with previous research suggesting a link between attachment and EC (Skowron & Dendy, 2004) in those with substance problems and implies that attachment dimensions are related to traits of emotional aloofness, anxiety, isolation from others and exaggerated independence (Nichols & Schwartz, 1998; Skowron & Friedlander, 1998). EC may be associated with, or a consequence of alexithymia, a personality trait associated with difficulties in identifying and describing feelings, a lack of fantasy life and an externally oriented thinking style (Sifneos, 1973). Previous research has found a significant relationship between insecure attachment and alexithymia (De Rick & Vanheule, 2006) and reported elevated prevalence rates of alexithymia in those with substance use disorders (Taylor et al., 1997; Thorberg et al., 2009).

In addition, attachment was examined in relation to I position (IP), with the Close dimension and gender predicting variance in IP. This is a noteworthy finding as the present data support the autonomous role of the Close attachment dimension in influencing a personality characteristic such as IP. IP refers to an ability to maintain a strong sense of self, have flexible boundaries and remain calm under stress (Skowron & Friedlander, 1998), and secure attachment is associated with being comfortable with closeness, having high levels of empathy and emotional insight (Laible, 2007; Lyvers et al., 2008). The present data also indicated that females showed higher levels of IP, in contrast to Bowen's proposal of no gender differences in self-differentiation (Bowen, 1978). Given that gender roles have changed over the last three decades it is thus possible that gender differences in IP could be associated with this development, or there may be differences associated with sample type. Thus, future research needs to be undertaken to clarify any potential gender differences in IP as well as other aspects of self-differentiation.



The investigation of attachment dimensions in relation to Fusion with others (FO) yielded a non-significant result. This may suggest that attachment is not associated with FO, yet a more plausible explanation concerns potential validity issues of this subscale (Tuason & Friedlander, 2000). Previous research has indicated low internal consistency of the FO scale (Skowron, 2000; Skowron & Friedlander, 1998) and non-significant correlations with constructs such as psychological adjustment and stress (Skowron, Wester, & Azen, 2004). By contrast, differentiation of self, ER, EC and IP scores were significantly associated with psychological adjustment and stress, and reliability analyses found high levels of internal consistency for these scales (Skowron et al., 2004). Given the psychometric limitations of the FO scale, exploratory factor analysis should be undertaken to find a more stable and reliable factor structure.

The findings of the current investigation highlight important implications for clinical practice. One potential goal of treatment could be to establish “earned attachment security” in the context of group psychotherapy, where individuals can rewrite historical working models of insecure childhood attachment and adult attachment security may be earned (McCarthy et al., 2002). Thus, attachment patterns could be assessed pre-treatment and then targeted during treatment, with a goal of establishing security based emotion regulation strategies (DeRick & Vanheule, 2007; Mikulincer, Shaver, & Pereg, 2003) as attachment information reflects rules and strategies associated with emotions (Fouladi, McCarthy, & Moller, 2002). Knowledge about attachment orientations may therefore assist in targeting some of the underlying mechanisms of affect regulation, fear of intimacy and level of self-differentiation as indicated by the present results. However, given the limited research conducted on “earned attachment security” in substance use disorders, further research is needed before this type of approach is implemented.

Given the cross-sectional design of the present study, issues associated with causal direction are left open and need to be investigated in future prospective research. Furthermore, personality characteristics such as NMR, FIS and self-differentiation may also vary according to the sample

examined, thus future research should replicate and extend the present findings in other types of clinical as well as non-clinical samples. Another limitation of the present study was the low internal consistency of the Close scale, potentially limiting the reliability of the present data, and this should be kept in mind when interpreting the findings. This result is in contrast to reliability analyses in other studies (Collins, 1996; Goldman & Anderson, 2007).

In the present study we utilised a self-report measure of adult attachment dimensions proposed to be more sensitive to subtle differences in attachment organisation than measures of attachment styles (Collins, 1996). However, subjective bias and shared method variance are always an issue with self-report measures and the RAAS does not allow for the measurement of different types of insecure attachment such as dismissing and preoccupied organisations. A study (Cloitre et al., 2008) using the Adult Attachment Interview (George, Kaplan, & Main, 1985) (an observer measure of attachment) found that insecure dismissing individuals tend to devalue attachment figures, idealise themselves and report high levels of confidence in mood regulation abilities in spite of observational evidence indicating relationship problems and high levels of physiological arousal (Creasy et al., 1999; Creasy & Ladd, 2004). Some researchers have proposed that attachment organisations are unconscious and can not be assessed accurately by self-report (Crowell & Treboux, 1995; Moller et al., 2002). Thus, the present findings may have been compromised by a lack of the ability to detect dismissing individuals. However, given that the present attachment scores were significantly different from community and student samples this still provides support for the validity of the present substance abuse data.

Taken together this study has confirmed important relationships between attachment dimensions, NMR expectancies, FIS and self-differentiation. Future research should expand on the present findings and include observational measures of attachment such as the AAI. By investigating different forms of insecure attachment in relation to NMR and interpersonal functioning we may obtain a more complete understanding of potential differences in affect

regulation and interpersonal styles, as well as the role of mood regulation and self-differentiation in substance use. In addition, assessing various dimensions such as emotional awareness, insight and understanding by a multimethod approach may give a more complete picture of the role of attachment in the prediction of emotion regulation and interpersonal functioning (Bakermans-Kranenburg & Van IJzendoorn, 1993; Gratz & Roemer, 2004; Kassel et al., 2007). Given that addicts report using alcohol and drugs to regulate negative moods, perhaps “earned attachment security” through therapeutic efforts and an increased confidence in mood regulation abilities may lead to decreased levels of negative affect that could potentially decrease the use of substances as a mood regulator.

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TABLE I Descriptive statistics and intercorrelations between predictor and criterion variables

	Mean (SD)	1	2	3	4	5	6	7	8	9	10
1. Anxatt	3.52 (0.986)	1.00	-0.42**	-0.50**	-0.34**	0.43**	0.53**	-0.45**	-0.53**	-0.32**	0.00
2. Depend	2.56 (0.729)		1.00	0.45**	0.90	-0.22*	0.30**	0.24*	0.31**	0.26*	-0.13
3. Close	2.87 (0.791)			1.00	0.19	-0.51**	0.43**	0.22*	0.57**	0.37**	-0.24*
4. NMR	95.28 (17.809)				1.00	-0.38**	0.24*	0.14	0.39**	0.97	-0.11
5. FIS	100.77 (20.538)					1.00	0.43**	-0.94	-0.64**	0.29**	0.11
6. Self-diff	141.44 (22.789)						1.00	.80**	0.70**	0.69**	0.39**
7. ER	34.32 (7.857)							1.00	0.33**	0.45**	0.41**
8. EC	42.21 (10.651)								1.00	0.29**	-0.11
9. IP	36.46 (9.587)									1.00	-0.61
10. FO	28.45 (6.333)										1.00

\*  $p < 0.05$ ; \*\*  $p < 0.01$ .

TABLE II. Hierarchical regression analyses predicting NMR expectancies and FIS.

Entry of predictor variables	B	Increase in <i>R</i>	Test of significance	P
NMR expectancies				
Step 1: Age, gender		0.04	F = .194, 2/97 df	0.824
Age	1.714		t = -0.414, 99 df	0.680
Gender	-.074		t = 0.471, 99 df	0.639
Step 2 Attachment		0.120	F = 2.662, 5/94 df	0.027
Depend	-1.901		t = -0.697, 99 df	0.488
Anxiety	-6.234		t = -2.979, 99 df	0.004
Close	1.259		t = 0.478, 99 df	0.634
FIS				
Step1: Age, gender		0.11	F = 0.523, 2/95 df	0.594
Age	-4.211		t = 0.235, 97 df	0.815
Gender	.049		t = -0.999, 97 df	0.320
Step 2 Attachment		0.304	F = 8.473, 5/92 df	0.0005
Depend	2.150		t = 0.765, 97 df	0.466
Anxiety	5.175		t = 2.399, 97 df	0.018
Close	-10.943		t = -4.030, 97 df	0.0005