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The Relationship of Alexithymia to Emotional Dysregulation Within an Alcohol Dependent Treatment Sample

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Abstract

Difficulties regulating emotions have implications for the development, maintenance, and recovery from alcohol problems. One construct thought to impede the regulation of emotion is alexithymia. Alexithymia is characterized by difficulties identifying, differentiating and expressing feelings, a limited imagination and fantasy life, and an externally-oriented thinking style (e.g., prefer talking about daily activities rather than feelings). Given that poor emotion regulation skills have been found to predict posttreatment levels of alcohol use, and that several defining characteristics of alexithymia bear similarity to deficits in emotion regulation skills, it is possible that alexithymia may predict poorer alcohol treatment outcomes. Thus, the present study first examined the relationship of alexithymia to several other emotion regulation measures and then investigated the impact of alexithymia on attrition and alcohol treatment outcomes in men and women (N = 77) enrolled in a 12-week cognitive-behavioral intervention for alcohol dependence. At baseline, higher scores on alexithymia were associated poorer emotion regulation skills, fewer percent days abstinent, greater alcohol dependence severity, and several high-risk drinking situations. Alexithymia was unrelated to attrition and to level of alcohol consumption at posttreatment. Overall, the construct of alexithymia is shown to be related to several theoretically-related constructs (e.g., emotion regulation, mindfulness) but demonstrated a limited relationship to drinking outcomes in those seeking treatment for alcohol dependence.

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Contributors

Authors 1, 2, 4, & 8 designed and wrote the study protocol. Author 3 directed the study protocol and provided supervision for both the treatment and research components of the study. Author 5 contributed to writing revisions and contributing additional analyses. Author 6 conducted literature searches, provided summaries of previous research studies, and took part in writing the methods section. Authors 7 conducted the statistical analysis. Author 1 wrote the first draft of the manuscript and all authors provided input into the final draft and have approved the revisions for the revised manuscript.

Conflict of Interest

All authors declare that they have no conflicts of interest.

Keywords

Alexithymia; affect regulation; alcohol use disorder; emotion regulation; mindfulness

1. Introduction

Negative emotions are a natural part of everyday life requiring the capacity for effective self-regulation. The combination of negative emotion and deficits in the ability to regulate emotion has implications for the development, maintenance and recovery from alcohol problems. For example, there is evidence that coping skills moderate the relationship between negative emotions and alcohol use (Holahan, Moos, Holahan, Cronkite, & Randall, 2001; 2003). Individuals who are prone to higher levels of coping-related alcohol use are those who have more alcohol-related problems. In addition, poor emotion regulation skills predict posttreatment levels of alcohol use (Berking, Margraf, Ebert, Wupperman, Hofmann, & Junghanns, 2011) and may increase risk for relapse in situations involving negative emotion (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003).

Effective emotion regulation skills include the ability to be aware of emotions, identify and label emotions, correctly interpret emotion-related bodily sensations, and accept and tolerate negative emotions (Berking et al., 2011; Gratz & Roemer, 2004). Alexithymia, first described by Sifneos (1973), is characterized by difficulties identifying and describing feelings, distinguishing between feelings and the bodily sensations of emotional arousal, and an externally oriented style of thinking. The defining features of alexithymia are in contrast to effective emotional regulation and research has demonstrated a relationship between alexithymia and maladaptive styles of emotion regulation (see reviews by Taylor, 2000 and Dubey, Pandey, & Mishra, 2010). For example, alexithymic individuals are more likely to use suppressive strategies and less likely to use reappraisal strategies as compared to non-alexithymic individuals (Chen, Xu, Jing, & Chan, 2011; Swart, Kortekaas, & Aleman, 2009). Individuals who primarily use suppressive strategies manage stressful situations by masking their inner feelings and clamping down on their outward displays of emotion. These characteristics are most similar to the Difficulty Describing Feelings subscale of the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994), a widely used measure of alexithymia. Of the two emotion regulation strategies, suppression and reappraisal, suppression has been shown to be related to greater mental and physical health problems, and is therefore considered a less adaptive strategy for regulating one's emotions (e.g., Gross & John, 2003). Similarly, alexithymia has been found to be negatively correlated with several measures of mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) which includes interest in and observation of feelings. The inability to identify and describe affective and physiological experiences is itself associated with elevated negative affect (Connelly & Denney, 2007). Thus, this unpleasant experience might prompt individuals to engage in maladaptive behaviors, such as excessive alcohol consumption, in an effort to regulate emotions, or, more specifically, cope with negative emotional states (see Thorberg, Young, & Sullivan et al., 2011) Given that poor emotion regulation skills have been found to predict posttreatment levels of alcohol use, and that alexithymia has been found to be related to deficits in emotion regulation skills, it is possible that alexithymia may have a negative impact on alcohol consumption and alcohol treatment outcomes.

Alexithymia has been shown to be associated with diverse medical and psychological disorders including eating disorders, pathological gambling, mood disorders, posttraumatic stress disorder, substance use disorders, somatoform disorders, and functional gastrointestinal disorders (e.g., Bydlowski, Corcos, Jeammet et al., 2005; Honkalampi, Koivumaa-Honkanen, Antikainen, Haatainen, Hintikka, & Viinamaki, 2004; Parker, Keefer,

Taylor, & Bagby, 2008; Toneatto, Lecce, & Bagby, 2009; Waller & Scheidt, 2004). Although a recent taxometric analysis provides evidence in support of alexithymia as a dimensional (rather than categorical) construct, studies utilizing the upper cut-off score on the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994) have reported prevalence rates ranging between 5 and 17% in community samples and between 30 and 60% in clinical samples (see Parker et al., 2008). The prevalence of alexithymia in studies investigating alcohol use disorders falls within the range identified above for clinical samples (i.e., 30–60%).

The prevalence of alexithymia among individuals with alcohol use disorders raises the question of whether alexithymia is a risk factor for alcohol problems. Although some authors have conjectured that alexithymia plays a role in the development and maintenance of alcohol use disorders (e.g., de Timary, Luts, Hers, & Luminet, 2008; Taylor, Bagby, & Parker, 1997), the empirical literature exploring this relationship is limited (see Thorberg, Young, Sullivan, & Lyvers, 2009 for a review). In one study, Finn, Martin and Pihl (1987) investigated the presence of alexithymia among males at varying levels of genetic risk for alcoholism. They found that the high risk for alcoholism group was more likely to be alexithymic than the moderate and low genetic risk groups. In another study of Turkish alcohol dependent inpatients, alexithymia was found to be related to several dimensions of Cloninger's psychobiological model of personality (Evren, Kose, Sayar et al., 2008). Specifically, high harm avoidance and self-trancendence and low self-directedness were identified as independent predictors of alexithymia. Although the study utilized a correlational design, the authors' suggest that alexithymia may be a risk factor for alcohol dependence. Finally, Honkalampi, Koivumaa-Honkanen, Lehto et al. (2010) conducted a prospective study using a small subsample drawn from Finland's National Popluation Register and found that alexithymia did not predict future alcohol use disorders directly. Rather, the results revealed an indirect effect that was mediated by depressive symptoms. Although the number of studies investigating alexithymia as a risk factor for the development of an alcohol use disorder are few, the studies reviewed here suggest that the relationship between alexithymia and alcohol use disorders may be both multifaceted (e.g., includes both environmental and genetic contributions) and indirect such that the effects of alexithymia on alcohol use and alcohol problems may be mediated by other variables previously shown to be predictive of alcohol use disorders (Honkalampi et al., 2010; Thorberg, Young, Sullivan, et al., 2011). Future research utilizing prospective longitudinal designs will need to be conducted to examine further the links between alexithymia and the development of alcohol problems. A better understanding of these relationships could prove helpful in terms of prevention as well as treatment.

With regard to treatment for alcohol problems, little is known about the impact of alexithymia on treatment process and outcomes. The few studies that have been conducted have shown that higher alexithymia scores are significantly, negatively correlated with both the number of treatment sessions attended and patients' ratings of the therapeutic alliance (Cleland, Magura, Foote, Rosenblum, & Kosanke, 2005). Other studies have shown that alexithymia predicted poor outcome in those patients who received either inpatient or outpatient treatment for an alcohol use disorder (Loas, Fremaux, Otmani, Lecercle, & Delahousse, 1997; Ziolkowski, Gruss, & Rybakowski, 1995). In the study by Cleland et al (2005), a higher level of alexithymia at baseline was associated with poorer alcohol treatment outcomes, but only among those with an alcohol use disorder only (i.e., no co-occurring drug use or drug use disorder). Taken together, the limited empirical research shows that higher levels of alexithymia may negatively impact treatment attendance and treatment outcomes. Still, research on the role of alexithymia in alcohol dependence treatment is lacking and the present study was conducted to address several issues identified

in a recent review of the alexithymia and alcohol use disorder literature as requiring additional research (Thorberg et al., 2009).

The present study had three main objectives; 1) to investigate the relationship between alexithymia and several related variables (i.e., emotion regulation, mindfulness variables), including drinking variables, within an alcohol dependent sample, 2) examine the relationship between alexithymia and attrition rates within a clinical sample, and 3) examine the effect of pretreatment levels of alexithymia on alcohol treatment outcomes. With regard to the first objective, we hypothesized that alexithymia would be positively related to alcohol problem severity and negatively related to several related constructs (e.g., emotion regulation, mindfulness). Given the limited empirical data on the relationship of alexithymia to treatment process and alcohol outcomes for alcohol dependence, analyses for the second and third objectives were exploratory.

2. Method

2.1. Participants

The sample included 77 men and women seeking outpatient treatment for alcohol-related problems. Participants were eligible for the study if they met DSM-IV criteria for current alcohol dependence and had a negative affect drinking profile, as determined by the Inventory of Drug Taking Situations--Alcohol Version (Annis, Sklar, & Turner, 1997; see Section 2.3 for details). These eligibility criteria were developed for the parent study investigating a novel affect regulation intervention for alcohol dependent men and women. Individuals were excluded if they met criteria for a current drug use disorder other than nicotine or marijuana. The sample was 51% female, with a mean age of 45.5 (SD = 11.07) and a mean of 14.07 (SD = 2.08) years of education. Eighty-seven percent of the sample was Caucasian and 13% were African American. Twenty-nine percent were currently married and 56.6% were employed either full- or part-time. Forty-three percent reported receiving previous outpatient treatment for alcohol problems and 15% reported a prior episode of inpatient treatment. The mean age at first alcohol treatment was 40.6 (SD = 13.97). Fourteen percent met criteria for either marijuana abuse or dependence.

2.2 Procedure

Individuals calling the project phone number were screened for initial inclusion criteria and provided a description of the treatment program. Those who were eligible and willing to participate were scheduled for an intake appointment with a research interviewer. During the intake appointment, informed consent was obtained and the remaining eligibility criteria (e.g., diagnosis, negative affect drinking profile) were assessed. Participants were then scheduled for a pre-treatment interview consisting of a questionnaire packet about alcohol use and ways of coping with unpleasant emotions. All participants were compensated with cash payments for completing the intake and pre-and post-treatment interviews.

Following the pre-treatment interview, individuals were randomly assigned to participate in 12 weekly sessions of manual guided cognitive behavioral therapy plus one of two treatment enhancements; either affect regulation training or health and lifestyle. The affect regulation intervention included clinical strategies designed to help participants better tolerate and cope with negative emotions that increase risk for drinking. The health and lifestyle intervention provided education about a variety of health-related topics (e.g., nutrition, exercise, reducing HIV risk). These two intervention groups were part of the parent study and supplemented the CBT for alcohol dependence that both groups received. As there were no baseline differences between groups, participants from both treatment groups are pooled for analyses.

The study was approved by the University Social and Behavioral Sciences Institutional Review Board.

Of the 77 individuals eligible for treatment, six failed to show for treatment sessions. Thus, 71 participants entered treatment. For those entering treatment the follow-up rate at post-treatment was 74.6%.

2.3. Measures

Demographic characteristics, current status information (e.g., marital status, employment) and substance abuse treatment history were obtained using a comprehensive background questionnaire administered during the initial intake appointment.

The *Mini International Neuropsychiatric Interview* (MINI; Folstein, Folstein, & McHugh, 1975) was used to obtain a partial list of DSM-IV Axis I diagnoses. The sections for alcohol use, drug use, depression, dysthymia, panic, social anxiety, and post-traumatic stress disorder were administered by trained research interviewers. The MINI has been determined to be a reliable and valid measure (Sheehan, Lecrubier, Sheehan et al., 1998).

The *Short Alcohol Dependence Data Questionnaire* (SADD; Davidson & Raistrick, 1986) is a 15-item measure of alcohol dependence. At baseline, participants completed the SADD in reference to the past 12 months. The SADD has demonstrated good internal reliability (Raistrick, Dunbar, & Davidson, 1983) and concurrent validity (Davidson & Raistrick, 1986). For this sample, the SADD had good internal consistency ($\alpha = .82$).

The *Timeline Follow-Back* (TLFB; Sobell & Sobell, 1992) is a calendar-based retrospective recall interview of daily alcohol use. The TLFB was used to estimate the number of standard drinks consumed each day and percent days abstinent over the 6 month period prior to the date of the initial intake assessment. The TLFB has been determined to be a reliable and valid measure of alcohol consumption (see Sobell & Sobell, 1992 for a review).

The *Drinker Inventory of Consequences* (DrInC; Miller, Tonigan, & Longabaugh, 1995) is a self-administered 50-item questionnaire designed to measure of drinking-related negative consequences in five areas: Interpersonal ($\alpha = .85$), Physical ($\alpha = .74$), Social ($\alpha = .79$), Impulsive ($\alpha = .71$), and Intrapersonal ($\alpha = .88$).

The *Toronto Alexithymia Scale* (TAS-20; Bagby et al., 1994) is a 20-item self-report measure of alexithymia. Items are rated using a 5-point Likert scale whereby 1 = *strongly disagree* and 5 = *strongly agree*. The TAS-20 has three factors: difficulty identifying feelings ($\alpha = .80$), difficulty describing feelings ($\alpha = .72$) and external-oriented thinking ($\alpha = .62$). It also yields a total score ($\alpha = .84$). A higher total score on the TAS-20 indicates a greater level of alexithymia. The TAS-20 has been shown to be a valid and reliable instrument when administered in an alcohol dependent sample (Thorberg, Young, Sullivan et al., 2010).

The *Inventory of Drug Taking Situations* (IDTS; Annis, Turner, & Sklar, 1997) provides a profile of situations in which an individual reports drinking heavily over the past year. Heavy drinking is measured across eight subscales including unpleasant emotions ($\alpha = .86$), physical discomfort ($\alpha = .56$), pleasant emotions ($\alpha = .85$), testing personal control ($\alpha = .82$), urges and temptations to drink ($\alpha = .67$), conflict with others ($\alpha = .90$), social pressure to drink ($\alpha = .86$), and pleasant times with others ($\alpha = .84$). Participants' whose highest subscale score was either unpleasant emotions or conflict with others met the study inclusion criteria for having a negative affect drinking profile.

The *Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003) is a 10-item questionnaire that measures emotion reappraisal (α = .81) and suppression (α =.75).

The *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004) is a 37-item measure that assesses self-reported emotion regulation difficulties. The DERS has six subscales including: non-acceptance of emotions (α= .93), difficulties engaging in goal-directed behavior when distressed (α= .87), impulse control difficulties (α= .89), lack of emotional awareness (α= .85), limited access to emotion regulation strategies (α = .81) and lack of emotional clarity (α= .87).

The *Negative Mood Regulation Expectancies Questionnaire* (NMRQ; Catanzaro & Mearns, 1990) is a 30-item measure of a person's beliefs about terminating negative moods. For this sample, the NMRQ had good internal consistency (α= .87).

The *Kentucky Inventory of Mindfulness Skills* (KIMS; Baer, Smith, & Allen, 2004) is a 39-item measure of mindfulness skills. The four subscales of the KIMS are Observe (α= .87), Describe (α= .91), Act with Awareness (α= .83), and Accept without Judgment (α= .82).

The *Mindful Attention Awareness Scale* (MAAS; Brown & Ryan, 2003) is a 15-item measure of mindfulness that was administered to assess individual differences in the frequency of and propensity to experience mindful states over time. For this sample, the MAAS had good internal consistency (α= .89).

The *Coping Responses Inventory* (CRI; Moos, 1997) is a 48-item self-report measure that identifies cognitive and behavioral responses that individuals use to cope with a recent problem or stressful situation. The 8 scales include Approach Coping Styles (Logical Analysis, Positive Reappraisal, Seeking Guidance, and Support and Problem Solving) and Avoidant Coping Styles (Cognitive Avoidance, Acceptance or Resignation, Seeking Alternative Rewards, and Emotional Discharge). The present study utilized the Approach (α = .85) and Avoidance (α = .78) subscales in the analyses.

2.4 Analyses

A recent study investigating the latent structure of the alexithymia construct provides data in support of alexithymia as a dimensional construct (Parker et al., 2008). Therefore, the TAS-20 was utilized as a continuous measure in the analyses that follow.

To address the first aim, namely to investigate the relationship between alexithymia and theoretically-related variables (i.e., emotion regulation, mindfulness, coping), including alcohol problem severity, we conducted several multivariate regression analyses using Wilkes' Lambda criteria. For all significant multivariate effects, follow-up multiple regression analyses were conducted and interpreted. Prior to analysis, all variables were examined for outliers and non-normality. Upon reigning in outliers (mean + or − 3 standard deviations), all distributions were acceptable. Due to our interest in examining the unique effect of alexithymia on theoretically-related variables, and because previous research in alcohol dependent samples had reported moderate to large correlations between negative affect and alexithymia (see Thorberg et al., 2009) we controlled for anxiety and depression scores as measured by the Brief Symptom Inventory in conducting these analyses.

3. Results

3.1. Relationships between alexithymia, drinking variables, emotion regulation, and mindfulness

We combined the results from both treatment groups after conducting a repeated measures ANOVA and finding no significant group by time interaction for TAS-20 total scores. However, there was a significant effect for time indicating that total TAS-20 scores decreased over time for both groups, F (1, 47) = *8.21*, p = .006. The mean change in total score from baseline to posttreatment was 3.7 (SD = 1.28).

3.1.1 Alexithymia and alcohol problem severity—To examine the relationship between alexithymia and alcohol problem severity, including amount of alcohol consumption, the SADD, DrInC-Total score, drinks per drinking day, and percent days heavy drinking were entered into the model as dependent variables. After controlling for anxiety and depression scores, the multivariate effect for alexithymia was non-significant, $F(4,70)=1.31$, $p=.28$, partial $\eta^2=.07$. However, a significant multivariate effect was found for depression scores, $F(4,70)=3.12$, $p<.05$, partial $\eta^2=.15$. Follow-up multiple regression analyses revealed significant positive relationships between depression and alcohol dependency (SADD) and consequences (DrInC). A summary of the zero order correlations and multivariate regression results are provided in Table 1 and Table 2 respectively.

3.1.2. Alexithymia and Drinking Situations—To examine the relationship between alexithymia and drinking situations, all eight subscales of the IDTS were entered into the model as dependent variables. Results indicated a significant multivariate effect for alexithymia after controlling for anxiety and depression scores, $F(8,66)=3.70$, $p<.001$, partial $\eta^2=.31$. Follow-up multiple regressions revealed significant positive relationships for effects for physical discomfort, conflict with others, urges/temptations, social pressure to use, and testing personal control (see Table 2 for summary of results). Further, a significant multivariate effect was also found for depression $F(8,66)=2.57$, $p<.05$, partial $\eta^2=.24$, with follow-up analyses indicating a significant positive relationship with unpleasant emotions only.

3.1.3. Alexithymia and Emotion Regulation Variables—To examine the relationships between alexithymia and emotion regulation variables, the NMRQ, DERS subscales (non-acceptance of emotions, difficulties engaging in goal directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional stability), and ERQ subscales (reappraisal and suppression) were entered into the model as dependent variables. Results indicated a significant multivariate effect for alexithymia, $F(9,65)=8.45$, $p<.001$, partial $\eta^2=.54$. Follow-up multiple regressions revealed significant relationships for all dependent variables except the reappraisal subscale of the ERQ after controlling for anxiety and depression scores. In addition, significant multivariate effects for anxiety [$F(9,65)=2.26$, $p<.05$, partial $\eta^2=.24$] and depression $F(9,65)=3.01$, $p<.01$, partial $\eta^2=.29$] were also found. Specifically, anxiety was significantly associated with the ERQ-suppression subscale only, whereas depression was found to be significantly related to the DERS-goal, DERS- impulse, DERS-strategy, and DERS- clarity subscales only.

3.1.4 Alexithymia and mindfulness—To examine the relationships between alexithymia status and the two measures of mindfulness, the KIMS subscale scores and the MAAS total score were entered into the model as dependent variables. Results indicated a significant multivariate effect for alexithymia, $F(5,69)=22.98$, $p<.001$, partial $\eta^2=.63$. Follow-up multiple regressions revealed significant relationships for all dependent variables

except the KIMS-accepting subscale (see Table 2 for summary of results). In addition, a significant multivariate effect was also found for depression $F(5,69)=2.39$, $p<.05$, partial $\eta^2=.15$, with follow-up analyses indicating a significant relationship with KIMS-accepting only.

3.1.5. Alexithymia and coping—To examine the relationships between alexithymia status and coping styles, CRI-approach and CRI-avoidance subscales were entered into the model as the dependent variables. Results indicated a non-significant multivariate effect for alexithymia, $F(2,71)=2.24$, $p=.11$, partial $\eta^2=.06$. However, a significant multivariate effect was found for depression $F(2,71)=71$, $p<.05$, partial $\eta^2=.11$, with follow-up analyses indicating a significant negative relationship with CRI- approach only.

3.2 Alexithymia and Attrition

To examine the effect of alexithymia on attrition (aim 2), a logistic regression was conducted controlling for anxiety and depression scores. Attrition was defined in two ways. First, attrition was defined as not providing follow-up data at post treatment (25.4%, n=18 did not provide post-treatment data). Controlling for baseline levels of anxiety, depression and alcohol problem severity the results show that alexithymia was not significantly associated with drop-out status at post-treatment (Exp(B)=1.00, p=.60). None of the covariates were significant. Second, attrition was defined as attending less than 50% (5 or less) of treatment sessions. A logistic regression comparing those attending 6 or more sessions (n = 51) vs. those attending 5 or fewer (n = 26) was not significant.

3.3 Alexithymia and Alcohol Treatment Outcomes

To examine the effect of alexithymia on alcohol treatment outcomes (aim 3), we conducted four separate hierarchical regression analyses for each of our primary alcohol related variables (SADD, DrInC, drinks per drinking day, and percent days heavy drinking). Prior to conducting the hierarchical regressions we investigated if significant differences existed on relevant drinking variables and the number of sessions attended between those who provided follow-up data versus those who did not. No significant differences were found for any of the four alcohol related variables; however, and not surprising, a significant difference was found on total number of sessions attended, $F(1,75)=19.1$, $p<.001$, partial $\eta^2=.20$. Due to significant differences found among those who completed post treatment measures and those who did not, for all analyses number of treatment sessions attended was entered in as a covariate. Thus, for all analyses, number of treatment sessions attended and pre-treatment scores were entered into the first step, anxiety and depression scores into the second step, and finally alexithymia scores into the third step. Summary of estimates, standard errors, and R^2 are presented in Table 3.

Results from these analyses found significant effects of alexithymia on severity of alcohol dependence scores. Specifically, greater alexithymia scores were associated with greater severity of alcohol dependence as measured by the SADD. Alexithymia was not associated with negative consequences of drinking, drinks per drinking day, or percent days heavy drinking at post-treatment after controlling for pre-drinking/consequence levels, anxiety, depression, and number of sessions attended.

4. Discussion

The aims of this study were threefold: 1) to examine the relationship between alexithymia and measures of several theoretically-related constructs (i.e., mindfulness, emotion regulation, and coping), 2) to examine the relationship between alexithymia and attrition,

and 3) to examine the effect of pretreatment levels of alexithymia on alcohol treatment outcomes.

An examination of baseline data revealed that higher scores on the TAS-20 were negatively related to a variety of emotion regulation skills, including expectancies for managing negative mood, and mindfulness. These data serve as an additional source of construct validity for alexithymia and provide further convergent evidence in support of alexithymia as a problem of emotion regulation. The picture that emerges from these data is that of a person lacking in emotional awareness, insight, and the capacity to describe and process emotional information in adaptive ways. The moderate correlation between the TAS-20 and the suppression scale of the ERQ is also suggestive of someone who attempts to manage negative emotional situations by pushing aside or restricting their feelings and who is reluctant to share their emotions with others.

While this study may be the first to examine these relationships in a sample of alcohol dependent men and women, the association of alexithymia, as measured by the TAS-20, and constructs such as mindfulness and emotion regulation has been previously documented and the results are consistent with those reported in this study. For example, a recent study of undergraduate students found significant negative correlations between the TAS-20 and the same measures of mindfulness (i.e., KIMS & MAAS) used in the current study (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). As Baer and colleagues point out, mindfulness includes interest in and observation of feelings and alexithymia involves difficulties identifying and labeling emotional states. Therefore, in the present study, it's not surprising that the TAS-20 correlated strongly (negatively) with the Describing subscale of the KIMS and with the total scores of both the KIMS and the MAAS.

With regard to emotion regulation, Swart et al. (2009) found those with higher levels of alexithymia to have lower reappraisal scores and higher suppression scores on the ERQ. Using the same measure of emotion regulation, the results from the present study, while showing a significant multivariate effect for the relationship between alexithymia and several emotion regulation variables, found that only the suppression subscale of the ERQ was significantly associated with alexithymia. However, consistent with the findings of Swart et al (2009), the pattern—low reappraisal and high suppression—was repeated in the present study and this pattern has been associated with lower levels of well-being (Gross & John, 2003). The present findings also converge with those of other studies that demonstrate a link between emotional suppression and worse social functioning in the short term (Butler, Egloff, Wilhelm, Smith, Erickson, & Gross, 2003) and in the longer term (English & John, 2011; Strivastava, Tamir, McGonigal, John, & Gross, 2009). Finally, there was a significant relationship between scores on the NMRQ, a measure of expectancies regarding one's ability to successfully cope with negative affect, and alexithymia; those who scored higher on the TAS-20 scored lower on the NMRQ indicating that they had lower expectations regarding their ability to successfully regulate negative emotional states. Together, these results provide further evidence of a relationship between alexithymia and measures of emotion regulation, including measures of mindfulness.

An additional contribution of this study is that it allowed us to examine the impact of alexithymia on attrition and alcohol treatment outcome. The relationship of alexithymia on attrition was explored in two ways. First, we compared individuals who provided data at the posttreatment interview vs. those who did not. Second, we compared individuals who received 6 or more treatment sessions to those who received 5 or fewer. For both analyses, the relationship between alexithymia and attrition was not significant. One possible explanation for the lack of an observed effect of alexithymia on attrition is that participants'

ratings of treatment satisfaction, as assessed with an 8-item Client Satisfaction Questionnaire, were uniformly high.

Regarding the impact of alexithymia on alcohol treatment outcome, the relationship between alexithymia and two alcohol consumption variables (i.e., drinks per drinking day and percent days heavy drinking) was not significant, nor was the relationship between alexithymia and negative consequences related to drinking. These results are similar to one other study that examined the relationship between scores on the TAS-20 and short-term alcohol outcomes in a sample of 32 alcohol dependent inpatients who received a 3-week course of motivational enhancement therapy plus six alcohol cue exposure sessions (Junghanns, Tietz, & Dibbelt et al., 2005). Six weeks after completing inpatient treatment, 21 patients (65%) were interviewed about relapse—defined as any alcohol consumption since discharge from treatment. Of the 21 patients interviewed, six reported a relapse and 15 did not. There were no differences between abstainers and relapsers with respect to alexithymia scores. Although the relationship between alexithymia and drinking outcomes are similar to those of the current study, it is important to note that we examined alcohol outcomes at the end of treatment whereas Junghanns et al (2005) examined outcomes 6-weeks posttreatment.

In contrast to the above findings, the results from the present study did demonstrate a small but significant relationship between alexithymia and severity of alcohol dependence at posttreatment. The lack of an association between alexithymia and the two alcohol consumption variables may seem at odds with the positive relationship between alexithymia and alcohol dependence severity. It's important to note, however, that alcohol dependence severity as measured by the SADD is defined, in part, by the quantity and frequency of alcohol consumption as well as the frequency of thoughts about alcohol, including thoughts about loss of control. Therefore, while alexithymia did not predict posttreatment levels of consumption, the results suggest that those who score higher on the TAS-20 may be at greater risk for relapse or reinstatement of heavy drinking following treatment based on such dimensions of the dependence syndrome as impaired control over alcohol. Although long-term treatment outcomes are not reported in this study, two previous studies found support for this assumption. In both studies, clinical levels of alexithymia were found to predict relapse in alcohol dependent patients. (Loas, Fremaux, Otmani, Lecercle, & Delahousse, 1997; Ziolkowski, Gruss, & Rybakowski, 1995). In one study, TAS-20 total scores were significantly higher for participants who reported relapsing at the 15-month posttreatment assessment vs. those who reported abstinence (Loas et al., 1997). In the other study, TAS scores predicted duration of abstinence; those who relapsed within the first year after treatment reported significantly higher TAS scores than those who abstained for more than one year (Ziolkowski et al., 1995). Thus, our finding of a relationship between alexithymia and alcohol dependence severity lends support to earlier findings that demonstrate a negative relationship between alexithymia and the maintenance of abstinence. As noted however, the effect of alexithymia on SADD scores was small, accounting for an additional 4% of the variance, and it would be imprudent to overinterpret the significance of this effect.

The results must be considered in light of the limitations present. The sample size is a limitation of the study. Although the baseline sample (N = 77) was adequate, attrition over the course of treatment resulted in a 69% retention rate for the posttreatment interview or 74.6% of those attending at least one treatment session. While this retention rate is quite good compared to attrition rates of 50% or more in alcohol dependent samples, only 52 individuals provided data at the posttreatment interview. This study also enrolled negative affect drinkers only. Negative affect drinkers were defined as drinking heavily most often in situations involving unpleasant emotions or conflict with others. Approximately 45% of alcohol dependent men and women who were screened for the study met criteria for a negative affect drinking profile as defined in this study. Although the impact of this

selection criterion on the results cannot be determined, the ability to generalize the results of this study across a broader range of alcohol dependent individuals is limited. However, despite these limitations, after controlling for anxiety and depression in the analyses, it is noteworthy that alexithymia continued to show positive relationships with several emotion regulation variables, mindfulness, a number of high-risk drinking situations, and alcohol dependence severity (i.e., SADD score). Thus, these data take into account the overlap between alexithymia and negative affect often observed in the literature, but the findings also support several factor analytic studies indicating that alexithymia and depression, for example, are distinct constructs (Marchesi, Brusamonti, & Maggini, 2000; Mueller, Buehner, & Ellgring, 2003; Parker, Bagby, & Taylor, 1991). A potential clinical implication of these results is the development and evaluation of interventions for alcohol dependence that include strategies for improving emotion regulation processes.

To summarize, findings from an investigation of baseline data suggest several conclusions. First, the TAS-20 measure of alexithymia showed good internal consistency in this sample of alcohol dependent men and women. Second, alexithymia showed expected relationships with several other variables that are conceptually related or unrelated to alexithymia. The pattern of relationships revealed in this study depicts the alexithymic drinker as characterized by cognitive biases and behavioral tendencies reflective of an inability to understand, process, and describe negative emotional states, resulting in strong desires to escape, suppress, and/or avoid such experiences. These results are consistent with emerging evidence that low emotional awareness, emotional avoidance, and problems identifying and describing emotions are linked to a variety of mental disorders (Linehan, Bohus, & Lynch, 2007). Third, TAS-20 scores were positively associated with the severity of alcohol dependence but not with the quantity and frequency of drinking posttreatment. Taken together, this study provides further evidence that alexithymia is a multifaceted condition of dysfunctional emotion regulation that includes lower levels of mindfulness and poorer coping skills that are present in both men and women, and which also shows a limited relationship to drinking outcomes in those seeking treatment for alcohol dependence.

Highlights

- Pretreatment levels of alexithymia are associated with poorer emotion regulation skills, fewer percent days abstinent, greater alcohol dependence severity, and several high risk drinking situations.
- Alexithymia was unrelated to attrition and to levels of alcohol consumption at posttreatment.
- The pattern of relationships revealed in this study depicts the alexithymic drinker as characterized by cognitive biases and behavioral tendencies reflective of an inability to understand, process, and describe negative emotional states, resulting in a desire to escape, suppress, and/or avoid such experiences.
- The results are consistent with emerging evidence that low emotional awareness, emotional avoidance, and problems identifying and describing emotions are linked to a variety of mental disorders.

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Table 1

Zero order correlations among predictors and dependent variables

	Anxiety	Depression	Alexithymia
Alcohol Problem Severity			
SADD	0.322**	0.479**	0.294**
DrInC Total	0.285*	0.393**	0.250*
Drinks per Drinking Day	0.101	0.188	0.152
% Heavy Drinking Days	−.018	0.098	0.076
Drinking Situations (IDTS)			
Unpleasant Emotions	0.337**	0.455**	0.260*
Physical Discomfort	0.399**	0.342**	0.385**
Conflict with Others	0.399**	0.280*	0.403**
Pleasant Times w/ Others	0.258*	0.277*	0.162
Pleasant Emotions	0.116	0.094	0.223
Urges/Temptations	0.187	0.285*	0.344**
Social Pressure	0.277*	0.242*	0.405**
Testing Personal Control	0.191	0.126	0.331*
Emotion Regulation			
NMRQ	−0.230*	−0.294*	−0.294**
DERS-Non Acceptance	0.485**	0.448**	0.152**
DERS-Goal	0.358**	0.508**	0.508**
DERS-Impulse	0.291*	0.355**	0.432**
DERS-Strategy	0.354**	0.544**	0.442**
DERS-Aware	0.393**	0.249*	0.596**
DERS-Clarity	0.259*	0.315**	0.672**
ERQ-Reappraisal	−0.167	−0.063	−0.256*
ERQ-Suppression	0.445**	0.298**	0.507**
Mindfulness			
MAAS	−0.280*	−0.187	−0.583**
KIMS-Observing	0.037	0.005	−0.218
KIMS-Describing	−0.310**	−0.123	−0.767**
KIMS-Acting	−0.343**	−0.251*	−0.375**
KIMS-Accepting	−0.472**	−0.496**	−0.348**
Coping Styles			
CRI-Approach	−0.112	−0.248	−0.154
CRI-Avoidance	0.217	0.140	0.262

** p-value < 0.01

* p-value < 0.05

Table 2

Summary of estimates and standard errors for multivariate regression analyses controlling for anxiety and depression

	Anxiety		Depression		Alexithymia		
	b (SE)	**β**	***b (SE)***	**β**	***b (SE)***	***B***	R^2
Alcohol Problem Severity							
SADD	−.02(.09)	−.03	***.38(.11)***	***.44*** **	.11(.07)	.17	***.26*** **
DrInC Total	.02(.26)	.01	***.81(.31)***	***.34*** **	.24(.20)	.14	***.17*** *
Drinks per Drinking Day	−.03(.09)	−.05	.14(.11)	.19	.04(.07)	.08	.04
% Heavy Drinking Days	−.56(.40)	−.21	.75(.47)	.22	***.59(.29)***	***.24*** *	.08
Drinking Situations (IDTS)							
Unpleasant Emotions	.06(.23)	.04	***.82(.27)***	***.39*** **	.19(.17)	.13	***.23*** **
Physical Discomfort	.35(.23)	.21	.29(.28)	.14	***.40(.17)***	***.26*** *	***.23*** **
Conflict with Others	.61(.32)	.26	.10(.38)	.03	***.60(.23)***	***.29*** **	***.23*** **
Pleasant Times w/ Others	.26(.33)	.12	.52(.39)	.19	.12(.24)	.06	.09
Pleasant Emotions	.03(.32)	.02	.06(.38)	.02	.40(.23)	.21	.05
Urges/Temptations	−.20(.27)	−.10	.61(.32)	.26	***.53(.20)***	***.31*** **	***.16*** *
Social Pressure	.19(.36)	.07	.29(.42)	.09	***.80(.26)***	***.35*** **	***.18*** *
Testing Personal Control	.15(.32)	.07	−.02(.38)	−.01	***.61(.24)***	***.31*** **	.11
Emotion Regulation							
NMRQ	.02(.21)	.01	−.42(.25)	−.23	***−.30(.15)***	***−.23*** **	.13
DERS-Non Acceptance	.11(.07)	.20	.15(.08)	.22	***.18(.05)***	***.36*** **	***.38*** **
DERS-Goal	−.04(.05)	−.09	***.23(.06)***	***.44*** **	***.15(.04)***	***.41*** **	***.40*** **
DERS-Impulse	−.01(.07)	−.03	***.16(.08)***	***.26*** *	***.17(.05)***	***.36*** **	***.24*** **
DERS-Strategy	−.06(.06)	−.10	***.34(.08)***	***.51*** **	***.16(.05)***	***.33*** **	***.39*** **
DERS-Aware	.09(.06)	.19	−.02(.07)	−.03	***.22(.04)***	***.52*** **	***.38*** **
DERS-Clarity	−.06(.05)	−.15	***.11(.05)***	***.21*** *	***.24(.03)***	***.67*** **	***.48*** **
ERQ-Reappraisal	−.06(.05)	−.12	.06(.11)	.08	−.13(.07)	−.23	.07
ERQ-Suppression	***.15(.07)***	***.28*** *	.01(.08)	.01	***.19(.05)***	***.39*** **	***.32*** **

	Anxiety		Depression		Alexithymia		
	b (SE)	**β**	***b (SE)***	**β**	***b (SE)***	***B***	R^2
Mindfulness							
MAAS	.00(.01)	−.05	.00(.01)	.01	−***.04(.01)***	−***.57*****	***.34*****
KIMS-Observing	.14(.13)	.16	−.01(.15)	−.01	−***.22(.09)***	−***.28****	.07
KIMS-Describing	−.06(.07)	−.09	.14(.08)	.16	−***.18(.05)***	−***.78*****	***.61*****
KIMS-Acting	−.12(.09)	−.20	−.03(.10)	−.04	−***.15(.06)***	−***.28****	***.18****
KIMS-Accepting	−.12(.07)	−.20	−***.23(.09)***	−***.32*****	−.09(.05)	−.17	***.31*****
Coping Styles							
CRI-Approach	.08(.16)	.08	−***.39(.19)***	−***.29****	−.11(.12)	−.11	.08
CRI-Avoidance	.08(12)	.10	.27(.14)	.25	.16(.09)	.20	***.19****

Note.

[a] SADD = Short Alcohol Dependence Data; DrInC = Drinker Inventory of Consequences; IDTS = Inventory of Drug Taking Situations (alcohol version); NMRQ= Negative Mood Regulation Expectancies Questionnaire; DERS= Difficulties in Emotion Regulation Scale; ERQ= Emotion Regulation Questionnaire; MAAS=Mindfulness Attention Awareness Scale; KIMS= Kentucky Inventory of Mindfulness Skills; CRI= Coping Response Inventory.

* p<.05,

** p<.01

Table 3

Summary of results from hierarchical regression analyses examining the effect of alexithymia on alcohol treatment outcomes

	SADD			DrInC			Drinks/Drinking Day			% Heavy Drinking Days		
	b (SE)	**β**	**ΔR^2**	***b (SE)***	***β***	**ΔR^2**	***b (SE)***	**β**	**ΔR^2**	***b (SE)***	**β**	**ΔR^2**
Step 1			***.51*** **			***.23*** **			.09			***.23*** **
# of Sessions	−.50(.24)	−.22 *		−.60(1.1)	−.08		.04(.13)	.04		***−2.3(1.0)***	***−.27****	
Pre-Tx Scores	***.72(.10)***	***.71*** **		***.57(.16)***	***.49*** **		***.17(.08)***	***.31****		***.41(.13)***	***.38*** **	
Step 2			.01			.04			.03			.03
# of Sessions	−.48(.24)	−.21		−.40(1.1)	−.05		.03(.13)	.04		***−2.5(1.1)***	***−.30****	
Pre-Tx Scores	***.72(.12)***	***.71*** **		***.48(.17)***	***.41*** **		***.16(.08)***	***.28****		***.38(.14)***	***.35*** **	
Anxiety	−.05(.11)	−.07		.55(.44)	.21		.02(.07)	.04		.76(.59)	.21	
Depression	.07(.09)	.11		−.01(.38)	.00		.04(.05)	.13		−.52(.46)	−.18	
Step 3			***.04****			.02			.00			.03
# of Sessions	−.46(.24)	−.20		−.25(1.1)	−.03		.04(.13)	.04		***−2.4(1.1)***	***−.29****	
Pre-Tx Scores	***.66(.12)***	***.66*** **		***.41(.18)***	***.35****		***.16(.08)***	***.29****		***.37(.14)***	***.34*** **	
Anxiety	−.04(.10)	−.05		.59(.44)	.23		.02(.07)	.04		.75(.59)	.21	
Depression	−.03(.10)	−.04		−.26(.43)	−.12		.03(.06)	.10		−.83(.52)	−.29	
Alexithymia	***.16(.08)***	***.26****		.45(.36)	.21		.02(.05)	.07		.51(.39)	.20	

Note. SADD = Short Alcohol Dependence Data; DrInC = Drinker Inventory of Consequences

* p<.05,

** p<.01